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Stoltzfus Library Circulation and Search System

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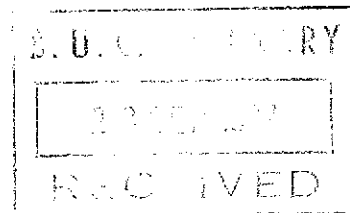
A project submitted for the degree of Masters of Science in
Computer Science
Natural Science Division
Lebanese American University
February 1997

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Original

*To Lebanese martyrs, Resistance knights...,
and to my parents*

Table of contents

Acknowledgments	iii
Abstract	iv
Chapter 1 Introduction to Application Requirements	
1.1 Overview of Library System	1
1.1.1 Acquisition	1
1.1.2 Classification	1
1.1.3 Cataloguing	2
1.1.4 Circulation	3
1.2 Reasons for Automation in Stoltzfus Library	3
1.3 Requirements : System Description	5
Chapter 2 Analysis Issues	
2.1 Data Requirements	10
2.2 Data Flow Diagrams (DFD)	16
Chapter 3 Design Issues	
3.1 Data Dictionnary : Table Design	39
3.2 Entity Relationship Diagram (ERD)	61
3.3 Hierarchical Chart	63
3.4 Structured English Description of Modules	64
Chapter 4 Implementation	
4.1 Listing of Forms, Queries, Macros, Reports, Module, Menus and Relationships among Them	74
4.2 Development Effort	98
4.3 System Requirements	99
4.3.1 Hardware	99
4.3.2 Software	100
4.3.3 Conversion	100
4.4 Conclusion and Suggestions for Further Work	101
Appendix A. User Manual	A-1
Appendix B. Reports Samples	B-1
References	

Acknowledgments

I would like to thank all the persons who helped me in completing my project directly or indirectly. I express special gratitude to Dr. Issam Moghrabi, my advisor for all his help and advice. I would like to thank Dr. Nashaat Mansour, my project reader for all his notes. A special thank goes to Mrs Aida Naaman, the library director and Mr. Kamal Jaroudi, the library supervisor for their help in gathering the needed information. Last but not least, I thank the computer center supervisor Tarek Dana and his assistant Ali Alwan.

***Abstract.** A library system can be divided into four parts : acquisition, classification and cataloguing , OPAC, and circulation. This project is concerned with the circulation and card cataloguing search. This report presents the analysis, the design and the implementation of the circulation and search application, which has been developed using MS Access for a PC network.*

Chapter 1

Introduction to Application Requirements

1.1 Overview of Library System

Library automation is now in use all over the world. Computer-based systems can assist in a variety of services like the acquisition of new items for the collection, maintaining and providing access to the catalogues, allowing the retrieval of information from databases relating to bibliographic data, and finally managing the circulation services.

Library items, in particular books, undergo many stages before being shelved for circulation. The following is a brief description of these stages which will help in understanding the project details.

1.1.1 Acquisition

The first basic stage is the acquisition of items. This step consists of receiving suggestions mainly from faculty members for ordering. Selection can be done from lists of different items received from publishers and dealers. The librarian studies all the suggestions and decides what to order. This decision is done in accordance with the library needs for the item and to the budget. Afterwards, the librarian fills and sends order statements to publishers or dealers for the selected items. Later, the publisher or dealer sends an invoice. The invoice is compared with the order statement to check for inconsistencies. In case of acceptance, the item is paid for and a receipt is handed over by the publisher or dealer along with the items. Then, the book is prepared for the next stage which is *classification*. The preparation may include stamping the item with the library stamp, putting magnetic tape, or binding (Corbett, 1966, pp. 154-172).

1.1.2 Classification

This is the second and most important step in the item life cycle. The librarian has to decide under which subject, under which collection and where on the shelves to put the item. In other words, he has to give the item an identification number or a *call number*. Nowadays, many classification methods exist of which are the *Dewey Decimal*

Classification (DDC), the library of Congress classification, the ISBN and others. Stoltzfus Library, for example, uses some special codes + DDC + cutter number + volume number + copy number. The most popular classification is DDC. As seen from this example, the library, sometimes, adds special codes and numbers to the classification number to identify the location, the copy number or the collection of the item (Corbett, 1966, pp. 255-288).

1.1.3 Cataloguing

The next step is the cataloguing stage begins. Catalogues should be able to :

- find an item given the title, the subject, the author , or somebody related to it like editors, translators, directors, or ...
- give what the library has under a subject or for an author
- assist in the choice of an item regarding its edition or as to its character

These points are known as Paris Principles (1961).

The main problem in this step is to be able to grasp all the bibliographic information of the item especially the book. That is why many ready-made software, nowadays, exists to assist or to ease this step. One example is the MARC (Machine-readable cataloguing) where the bibliographical information is in records and the library can customize the information for its database. This way the bibliographic information are duplicated on card catalogues for each entry. Entries are decided to be able to identify the item by author or different subjects. After this step the item is out on the appropriate shelf or cabinet (Tedd, 1993).

Relation between classification and cataloguing : Classification and cataloguing are not two totally independent steps. Classification is useless without cataloguing. On the other hand, cataloguing cannot be done without classifying the item which specifies the different entries in the catalogues.

The items are now on shelves, and card catalogues exist to locate them. The user search for an item is done by the card catalogues given the title, the author, or the subject under which the item is. Manually this is extensive. Automatically, Online public access catalogue (OPAC) has been designed to allow library users to search the catalogue database for an item as easily as possible (Corbett, 1966, pp. 344-348).

1.1.4 Circulation

The circulation desk is the front end to any library. Services supported at the desk vary with the type of patrons, the items they are looking for and the library itself. There is academic libraries, for example, for students with holdings including books, serials, audio-visual materials, and equipments. Another example is public libraries devoted for enrolled public with holdings including books, and serials.

What is required in all libraries is a circulation system where it can be know what is in and what is out, to discharge items for qualified patrons, to fee patrons with overdues, and to tell who has what. This is has to be done accurately, timely, and with less effort and time devotion by staff members (Corbett, 1966).

1.2 Reasons for Automation in Stoltzfus Library

Stoltzfus library faces many problems with all the services being done manually. The library is facing a real problem in keeping record and controlling what is going on in the library especially at the circulation desk; that is why the circulation and OPAC modules were the first to implement. The list of problems that was behind the implementation can go indefinitely; however the most important causes are listed below.

Problems :

- No accurate lists of what is in and what is out, assistants have to go all the way to the shelves to know.
- Queues of patrons are formed at the circulation waiting for an assistant to be served.
- Rarely, a patron is charged for overdues. There is no way to know who has overdue books except of course if the librarian is willing to search in at least 500 patrons' card for overdue books every evening.
- A patron may be served although he has overdues or due fines.
- Many books are lost every year due to inaccurate registration or checking.
- No records for what was on the reserved shelf for last semester .

- No accurate schedules for equipment reservation, an equipment may be reserved in conflicting hours or doubly reserved; an equipment may be out of order and still reserved.
- No hard copy or computerized one on the library holdings for a subject or for an author.
- A patron may remain wandering for hours between card catalogues because she/he does not have the appropriate term for the subject she/he is looking for.
- An entry in card catalogues can be accessed by only one user at one time.

Out of these problems come the reasons for automated circulation system that can fulfill the following goals :

- precise recording and maintenance of loan transaction data;
- accurate, and thorough administration of overdues, fines and other exception conditions;
- recording of, and access to, status and other information about the collection (e.g. on loan, overdue, lost, reserved);
- increase in speed and efficiency of service to patrons;
- reduction in workload to manage reserve items;
- efficient maintenance of patrons records;
- provision of accurate, reliable, and timely statistics;
- evaluation of library items and equipment on the basis of usage;
- an increased number of access points for both staff and patrons for searching in card catalogues;
- faster and easier way of search.

For the above reasons and many others, the Stoltzfus library director seriously decided to seek for the implementation of an automated library system, with this project being the first and fundamental step.

1.3 Requirements : System Description

To grasp the requirements of the system , many interviews have been conducted with the library director, and the circulation supervisor. Based on these interviews and on many computer-based library systems booklets such as *Oracle*, *Horizon*, *Dynex* and *VTLS*, the functions of the system have been determined. In this section, a detailed description of the system functions will be presented.

As mentioned before, the system consists of two parts : the circulation function and the card catalogue search function. The circulation function will be the first to look at.

Stoltzfus Circulation Function

The circulation function is actually divided into three subfunctions : the books circulation, reserve book room circulation, and non-book media circulation. In common to these three are the patrons records. Each subfunction will be presented in detail.

- **General Features** : The circulation function works semester by semester. This means that books are on reserve shelf for current semester, last date for check outs is the last day in the semester, faculty due dates is the end of current semester, and patrons are checked for registration status at the end of each semester. That is why a special section is devoted to set these data (current semester, first and last days in semester).

Since the scope of this project is not a complete library system, the files containing the library items will be empty. The solution is to add items to files one by one when they are needed, i.e. an item is to be checked out or reserved. Afterwards, when the library system is complete, this option is switched off and the files will be filled with items in the database.

The system will be implemented on a network as the nature of the system requires this.

- **Patrons subfunction** : Patrons are identified by predetermined ID or by a serial ID given by the computer. Patrons are grouped into classes with a defined borrow period and number of books. The different groups are identified by the library at code section; however, basic groups are predetermined by the system, i.e. faculty and students groups (PFAC (part time faculty), FFAC (full time faculty), STD (under graduate students), GSTD (graduate student)).

A patron is qualified for loans if registered for the current semester and has no due fines.

A patron's record will not be deleted except if a faculty member leaves university or if a

student has graduated. Of course, the record will not be deleted in case of due books or fines.

The needed attributes are ID#, name (first, middle, and last), and box#.

• **Books circulation subfunction** : It manages and controls the loans functions. The activities comprised in this subfunction are : check a book in, check a book out, renew the loan of a book, pay fines or charge a patron, put a hold on a book.

- **Check out** : the needed attributes are the book call number and the patron ID# or his last name. The conditions to execute this command are :

- the patron is registered for the current semester and he/she does not have any overdues or due fines.

- a copy of the book is available.

- the required book is not on reserve, on hold, a reference book or closed circulation.

If these conditions are satisfied, the book is checked out and an automatic calculation of due date is done. In case the second condition is the only violation, the patron is given the option to be queued to put the book on hold.

- **Check in / renewal** : Check in can be done by two means either the ID# of the patron or the call number of the book. When the concerned book is selected, the patron can return or renew the book. However, few conditions must be fulfilled :

- the book is not on hold for another patron, or recalled to be put on reserve

- the book is not overdue

- the patron does not have overdues, or due fines

- the patron is registered

In case of overdue, the patron is automatically charged (except the faculty members) and blocked and the book is checked in. In case the first condition is violated, the first patron in the hold queue is notified, or if recalled, the book is put on the reserve shelf. If the third or fourth conditions are violated, the book is immediately checked in.

- **Hold Subfunction** : the circulation module must grant the patrons the right to put a book on hold. A book on hold means that when the book is returned, the patron on hold is the one who gets it first. In case of more than one request, a queue of waiting patrons is formed by giving each patron a serial number (1, 2, 3, ...). However, faculty members have priorities over all other classes of patrons.

Now, we discuss how the hold system acts when the book is checked in. The patron is sent a message informing him/her that the book is on hold for him/her for three days only. After 3 days, if the patron fails to request the book, the second patron is informed and so on till a patron requests it or it is back to circulation.

The system should further offer the option for the librarian to delete a hold or to delete all unresponded holds.

- **Fines** : Manually, fees collection is the most chaotic function. A patron may be charged for four reasons : overdues, misuse of book, dead loan, or lost book. The first and two last cases are detected on check in. The second is an option in fines.

All patrons are charged for overdues except faculties.

A book is considered overdue after 48 hours of its due date and the patron is denied any service. At that time, the patron is sent a memo telling her/him to return the book immediately for she/he is being charged. Then, if no eminent response is made, a second notice is sent with the same message. The third notice is sent with a copy to Guidance Office, if the patron is an LAU student.

Due fines are paid at the circulation desk with overriding option if for valid excuse and by the circulation supervisor only. A receipt is given to the patron and the data is saved with the specific time and date of payment. A patron is blocked till she/he pays all the charges.

• **Reserve Room Subfunction** : A book can be put on reserve shelf by a professor for indoor usage by patrons. Expiration date for reservation is the end of the semester. A book can be on reserve for more than one course and by different professors. The submodule should grant the option to search for books on reserve by professor name, by course or by a specific call number. The submodule should keep all reservation records even after expiration date.

• **Audio Visual Circulation Subfunction** : Equipments and materials such as maps, films, slides and many others are treated differently. Their loan policies differ from the book policy.

- **Equipments** : The library possesses audio-visual aid equipments (LCDs, overhead projectors, book projectors, ...) to assist in the education process. Not to fall in the problem mentioned before in the **Problems** section, a control system is needed to maintain the reservation of equipments. The loans policy of equipments works like the following :

- reservation has to be done 3 days ahead
- reservation can be done only by faculty or staff
- if an equipment is needed by students for a course, the teacher should make the reservation.

Since the library system is not complete, a stock form is needed.

- Maps and Materials : Maps and materials loans (Films, Film Strips, Slides, TRansparencies, Sound Film Strips, Phonorecords, Recordings, Tape Cassettes, VIDEO, Compact Disks, and others) follow the same policy; however, they need separate tables because their call number format differs. The policy works as follows :

- Reservation should be done 3 days ahead
- They can be borrowed for outside usage only by faculty and staff members(not always) over week-ends
- Reservation can be done only by faculty or staff members
- if a map/material is needed by students for a course, the teacher should make the reservation

Since the library system is not complete, if on reservation a map/material is not in database, the user is given the option to add it to database.

• **Reports Subfunction** : Many kinds reports are needed to assist the librarian in his work :

- Statistical reports :
 - Loans statistics by subject over weeks, months, or years
 - Loans statistics for a subject over weeks, months, or years

This kind of reports is needed to help in deciding the priority of different orderings.

- List of current patrons in a group
- List of books in a collection
- List of borrowed books by a patron
- List of all borrowed books
- List of overdue books
- List of lost books, i.e., books reported as missing or considered as dead loan books
- List of abusing patrons , i.e., patrons that have been sent 3 warning memos for overdue books but did not respond
- List of books on reserve shelf for :

- an instructor for a semester
- a course for a semester
- a semester
- an instructor teaching a course for a semester
- Collected fines
- Due fees still uncollected
- Table of reservation between 2 dates for equipments, A/V Material, or Maps
- List of all books, A/V materials, Maps, or Research Topic/Thesis.

Card Catalogue Search Function

Professionally, this is called OPAC as defined before. However, since the module does not provide all OPAC services (immediate checking out by patron on the item, immediate checking by patron if the item is available, report all bibliographic information), it will not be called as such.

The library holdings are divided into 4 kinds : books, maps, Audio/visual material and Research topics/ theses. All 4 kinds can be searched by three means : by title, by author or any one who has worked on the item like editor, translator, director, and so on or by subject.

Prior to this step, all items should be entered to proper tables, each item should be linked to the subjects it falls under, and each item should be linked to authors, editors, translators, directors, actors, or composers, or In addition, to ease the search of non professional patrons, each subject should have synonyms such that when the patron enters a synonym of a subject, he/she gets the same result.

Chapter 2

Analysis Issues

After all the requirements has been gathered, the analysis phase started. Based on the requirements in each subfunction, the data structure of the system became clear. Now, since this system is the milestone of the whole library system, some of the data structures will not be used by the system but are designed as basis for further developments.

The following section will discuss the data structure of the system.

2.1 Data Requirements

Before starting the detailed description of the different tables, a couple of points should be cleared to clarify the distribution of data over the tables. First, the library possessions are divided into many classes based on their kinds and usages. Actually, they are divided into five classes : books, Audio/Visual, Maps, research topic/thesis and periodicals. The periodicals are not handled by the system. The format of the call number for the item varies with the variation of the classes. To avoid any ambiguity in the tables primary keys , 4 tables were designed for the 4 classes of items despite the fact that the other fields may not totally differ.

Second, the library uses a special classification method to give an item a classification number (Horner, 1973). The classification number in general is composed of the following parts :

- Collection code : an item may be part of special collections such as : IWSAW (Institute of Women Studies in the Arab World) discussing social and women issues, or Closed area Circulation such as controversial books, precious books, research topics , thesis or manuscripts. Manually, this can be “W” , “c.c.” or other codes.
- Type code : an item may be a reference book. This code tells whether the book is a reference book or not. Manually, this is the “R” in the call number of a book.
- Size code : Books are of different sizes that is why oversized books are coded by “f” which stands for folio. So, this code tells whether a book is folio or not.
- Language code : the item language may be Arabic (“A”) or Latin (“E” or nothing for English , “F” for French, or “G” for German).

- Format code : the items may be books, films, maps, slides, etc... One way to identify them is by giving each a code describing its nature. So, the format code tells the nature of the item. For example, "F" stands for films, "vid." for video, and "TC" for tape cassettes.

- Dewey Decimal Classification number : as explained earlier, each library follows certain system to classify a book according to its theme subject. The Stoltzfus library uses the DDC method. It is formed of a decimal number with the following format "999.9999999999999999".

- Cutter number : In addition to the DDC number the item needs another field to be uniquely identified. The cutter number is composed of the following :

first letter of the item author-a book mark-first letter of the item title-edition (if not first).

This way items get identified uniquely.

However, for A/V materials this field is a simple serial number for each item.

- volume number : An item may have many volumes or parts. This field identifies the different volumes or parts of an item.

- copy number : due to demand on an item, the library may get more than one copy of an item. This field identifies the different copies.

Now, all these fields form the call number of an item. Not all of these fields will be used in all tables. Once all the tables are defined, the idea will get clearer.

Tables

1. **A/V** : It contains the schedule of reservation for the A/V materials.

A/V (Collection, Language, Format, Cutter, Part-no, Copy-no, FromDate, ID#, ToDate, Division, Place).

2. **ArchPatron** : The purpose of this table is as an archive file. It contains the list of students / patrons who are still legitimate users but are currently unregistered.

ArchPatron(ID#, First-Name, Last-name, Middle-Name, Box#, Ctgy, Status,Regstrd).

3. **AVMaterial** : This is where all the bibliographic information of an A/V item are saved.

AVMaterial (Collection, Language, Format, Cutter, Copies, Parts, Title, PubPlace, PubID, PubDate, Collation, SeriesName, SeriesNumber, Bibliography, DescNote, Congress, MARC, EditionNumber).

4. **AVSubject** : In this table, each A/V item is linked to subjects under which it is classified.

AVSubject (Subject-no, Collection, Language, Format, Cutter).

5. **AVWorkers** : This table links each item with the records of workers that have worked on this item.

AVWorkers (Collection, Language, Format, Cutter, WorkerID, Job-code).

6. **Books** : All the bibliographic information of all books collections is found in this table. Books composed of many volumes possess only one entry since the information is the same. Copies of the same book also possess only one entry.

Books (Collection, Size, Type, Language, Format, DDC, Cutter, Vol-no, Copies, Title, PubPlace, PubID, PubDate, Collation, SeriesName, SeriesNumber, Bibliography, DescNote, ISBNNumber, Congress, MARC, EditionNumber).

7. **BookSubject** : This table links each book to the tree of subjects under which it is classified.

BookSubject (Subject-no, Collection, Size, Type, Language, Format, DDC, Cutter).

8. **Calender** : This is the schedule of reservation of the audio visual aids equipments.

Calender (Serial#, FromDate, ID#, ToDate, Division, Place).

9. **Codes** : The system needs to code some terms to facilitate its job. This table contains the different codes along with their descriptions. The codes varies from codes for the different groups of patrons to codes of workers on items to certain codes used by the library itself for classifying items. Some of the codes are permanent which are :

PFAC	part time faculty
FFAC	full time faculty
STF	staff
GSTD	graduate student
STD	undergraduate student
TEMP	temporary patron for inner usage of library books
L----	leading author, editor, translator, director, or any job ; sometimes an item has more than one worker this code tells which one to display for an item.

Codes (Code, Description, No-Books, Duration).

10. Copies : This table is an extension of the Books table. Each volume of a book has an independent entry, and each copy has an independent entry. The purpose of this table is to tell the status of the books.

Copies (Collection, Size, Type, Language, Format, DDC, Cutter, Vol-no, Copy-no, DatePurchased, PurchasePrice, Status, DealerID).

11. Dealers : The library possesses a list of dealers for acquisition purposes. Each purchased item is linked to the dealer that supplied it by dealer-ID.

Dealers (Dealer-ID, Name, Address, City, State, Region, PostalCode, Country, FaxNumber, Note).

12. Eqpmnt : This the stock of audio visual aid equipments that the library has.

Each equipment is given a separate entry.

Eqpmnt (serial#, AV-Eq-Type, FabDate, Purchase-Date, Price, DealerID, Status).

13. Fines : Patrons are charged for delays, misuse, and lost books. Charges are calculated and their total is saved in this table with an entry for each patron.

Fines (ID#, Due-Fees).

14. HistLoans : This is an archive table where all loans are saved for statistical purposes.

HistLoans (RecordNumber, Collection, Size, Type, Language, Format, DDC, Cutter, Vol-no, Copy-no, ID#, Check-out-Date, DueDate, Notice#).

15. Hold : Some books are more popular than others, patrons are given the choice to put a hold on a book so as to take a turn in the waiting queue. It does not consider which copy.

Hold (ID#, Collection, Size, Type, Language, Format, DDC, Cutter, Vol-no, Serial, HoldDate).

16. Loans : Patrons borrow books, the job of this table is to keep record of each loan.

Loans (Collection, Size, Type, Language, Format, DDC, Cutter, Vol-no, Copy-no, ID#, Check-out-Date, DueDate, Notice#).

17. MapRes : It contains the schedule of reservation for maps.

MapRes (Collection, Language, Format, DDC, Cutter, Copy-no, FromDate, ID#, ToDate, Division, Place).

18. Maps : All the bibliographic information of maps collections is found in this table.

Maps (Collection, Language, Format, DDC, Cutter, Copies, Title, PubPlace, PubID, PubDate, Collation, SeriesName, SeriesNumber, Bibliography, DescNote, Congress, MARC, EditionNumber, MProjection, Mform).

19. **MapSubject** : This table links each map to the tree of subjects under which it is classified.

MapSubject (Subject-no, Collection, Language, Format, DDC, Cutter).

20. **MapWorkers** : This table links each map with the records of workers that have worked on this item.

MapWorkers (Collection, Language, Format, DDC, Cutter, workerID, Job-code).

21. **Misc** : as its name denotes, this table is for miscellaneous information.

What is needed from it is only one record.

Misc (Semester, SemStart, SemEnd, SerialID, FullDB, Penalty).

22. **On-Res** : A professor can put a book on reserve for the students of a course. A book can be put on reserve shelf by more than one professor, for more than one course, for more than a course by the same professor, and for the same course by more than a professor. Records are to be kept over semesters for archiving purposes.

On-Res (Prmry-key, Course-no, Collection, Size, Type, Language, Format, DDC, Cutter, Vol-No, Copy-No, ProfID#, Semester).

23. **Patrons** : This is the list of patron, i.e. users allowed to use the library facilities.

Patrons (ID#, First-Name, Last-Name, Middle-Name, Box#, Ctgry, Status, Regstrd).

24. **Payments** : It lists the payments done.

Payments (Receipt#, ID#, Paid-amnt, Pay-Date).

25. **Publishers** : The library possesses a list of publishers for acquisition purposes. Each item is linked to its publisher by Pub-ID.

Publishers (Pub-ID, Name, Address, City, State, Region, PostalCode, Country, FaxNumber, Note).

26. **Res-Loan** : Books on reserve shelf can be borrowed for inner use, this table is needed to keep track of with who each book is.

Res-Loan (ID#, Collection, Size, Type, Language, Format, DDC, Cutter, Vol-no, Copy-no, LoanDate).

27. **RTTh** : All the bibliographic information of all research topics and theses collections is found in this table. RT/Th composed of many volumes possess only one entry since the information is the same.

RTTh (Collection, Language, Format, DDC, Cutter, Vol-no, Copies, Title, PubPlace, PubID, PubDate, Collation, SeriesName, SeriesNumber, Bibliography, DescNote, ISBNNumber, Congress, MARC, EditionNumber).

28. RTThSubject : This table links each RT/Th to the tree of subjects under which it is classified.

RTThSubject (Subject-no, Collection, Language, Format, DDC, Cutter).

29. RTThWorkers : This table links each RT/Th with the records of workers that have worked on it.

RTThWorkers (Collection, Language, Format, DDC, Cutter, WorkerID, Job-Code).

30. Synonyms : Non-professional users of library may not have the appropriate term for subject search, this table plays the role of a thesaurus for TreeSubject table.

This table should be filled in Cataloguing module.

Synonyms (Synonym, Subject-No).

31. TempLoans : For statistical reasons, the Loans and HistLoans tables are appended in this table.

TempLoans (RecordNumber, Collection, Size, Type, Language, Format, DDC, Cutter, Vol-no, Copy-no, ID#, Check-out-Date, DueDate, Notice#).

32. TreeSubject : Subjects under which books and other items are classified, are organized in a tree. Each subject is given a unique number.

This table should be filled in Cataloguing module.

TreeSubject (Subject-No, Description).

33. Worked-on : This table links each book with the records of workers that have worked on it.

Worked-on (Collection, Size, Type, Language, Format, DDC, Cutter, WorkerID, Job-Code).

34. Workers : Workers, that have contributed to one of the items the library possesses, are listed in this table with its personal data.

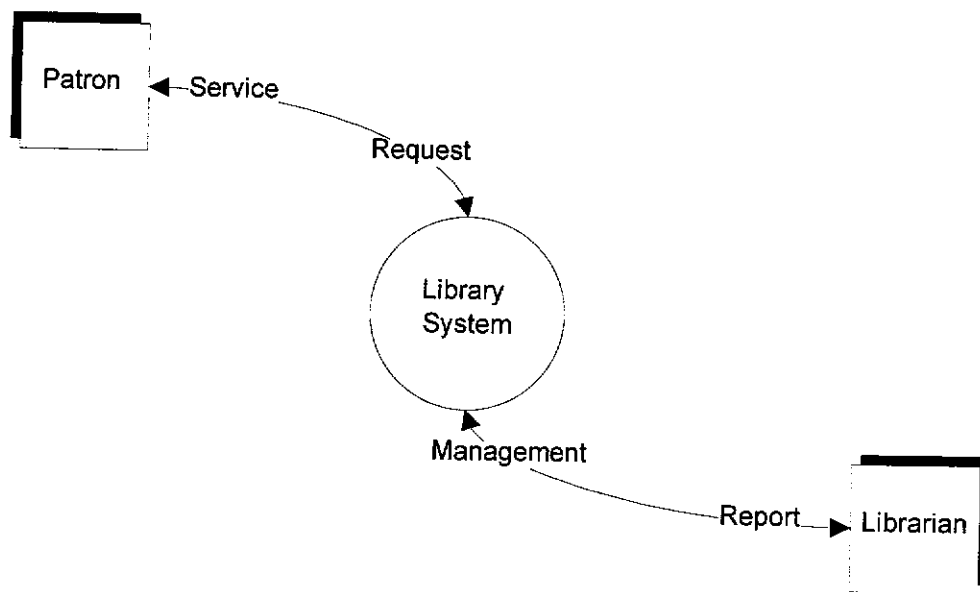
Workers (Ser-No, First-Name, Last-Name, Middle-Name, Birth).

2.2 Data Flow Diagrams (DFD)

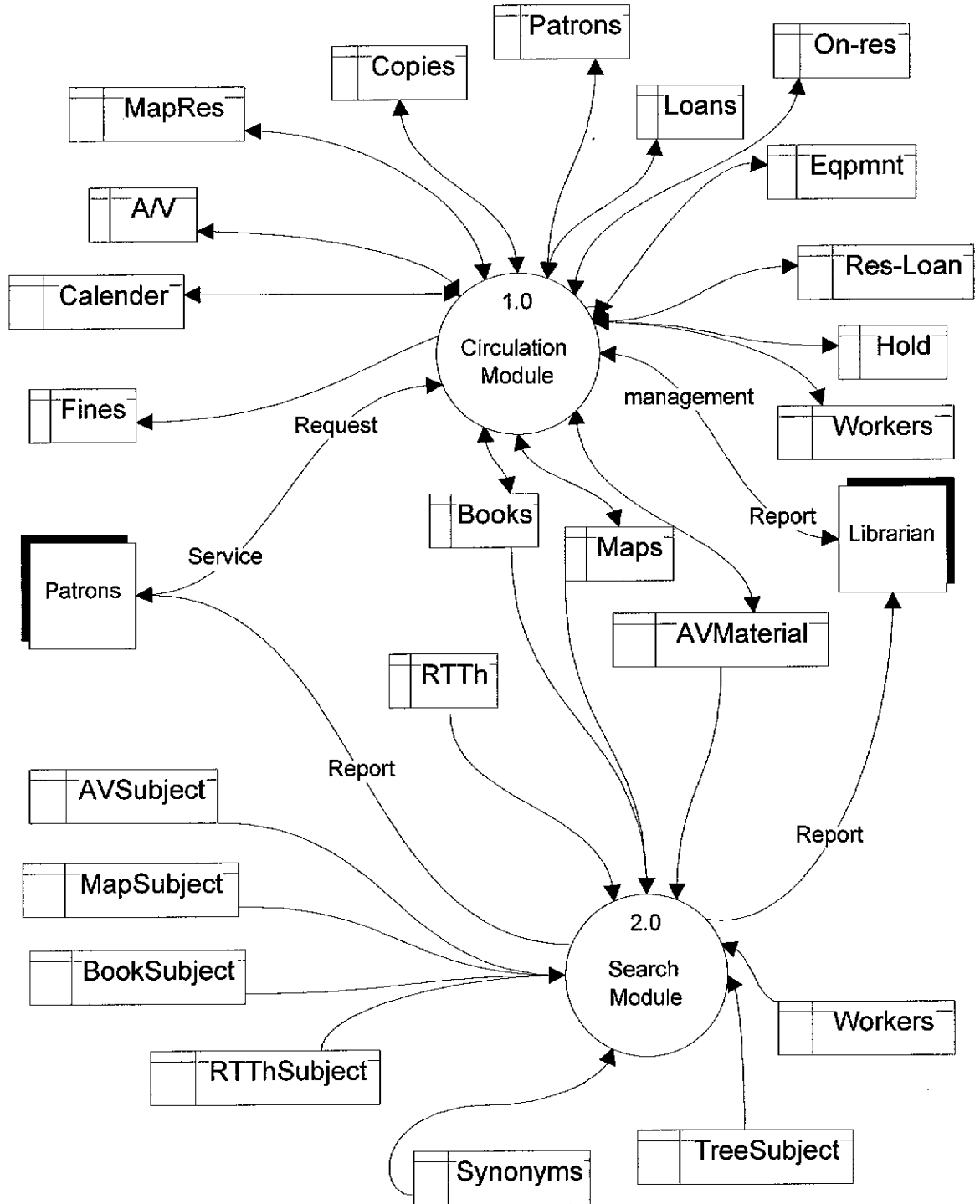
The data flow diagrams will be expanded in levels. It should be noted that some tables flow of data were not pictured so as not to confuse the diagrams, especially that these flows are not of any importance. The flows can be summarized as follows :

- When a patron's ID# is entered its name is automatically searched from the patrons table.
- When the call number of any item is entered its title and author are automatically checked against the appropriate tables : Books, Maps, Avmaterial, or Eqpmnt and from Workers tables by interrelationship with Worked-on, MapWorkers, or AVWorkers.
- Reports data is derived from many tables according to the option and query entered.
- When a patron wants to return an item by ID#, the list of all loans is automatically displayed from Loans, Books, Worked-on, and Workers tables or from ResLoan, Books, Worked-on and Workers or so on.

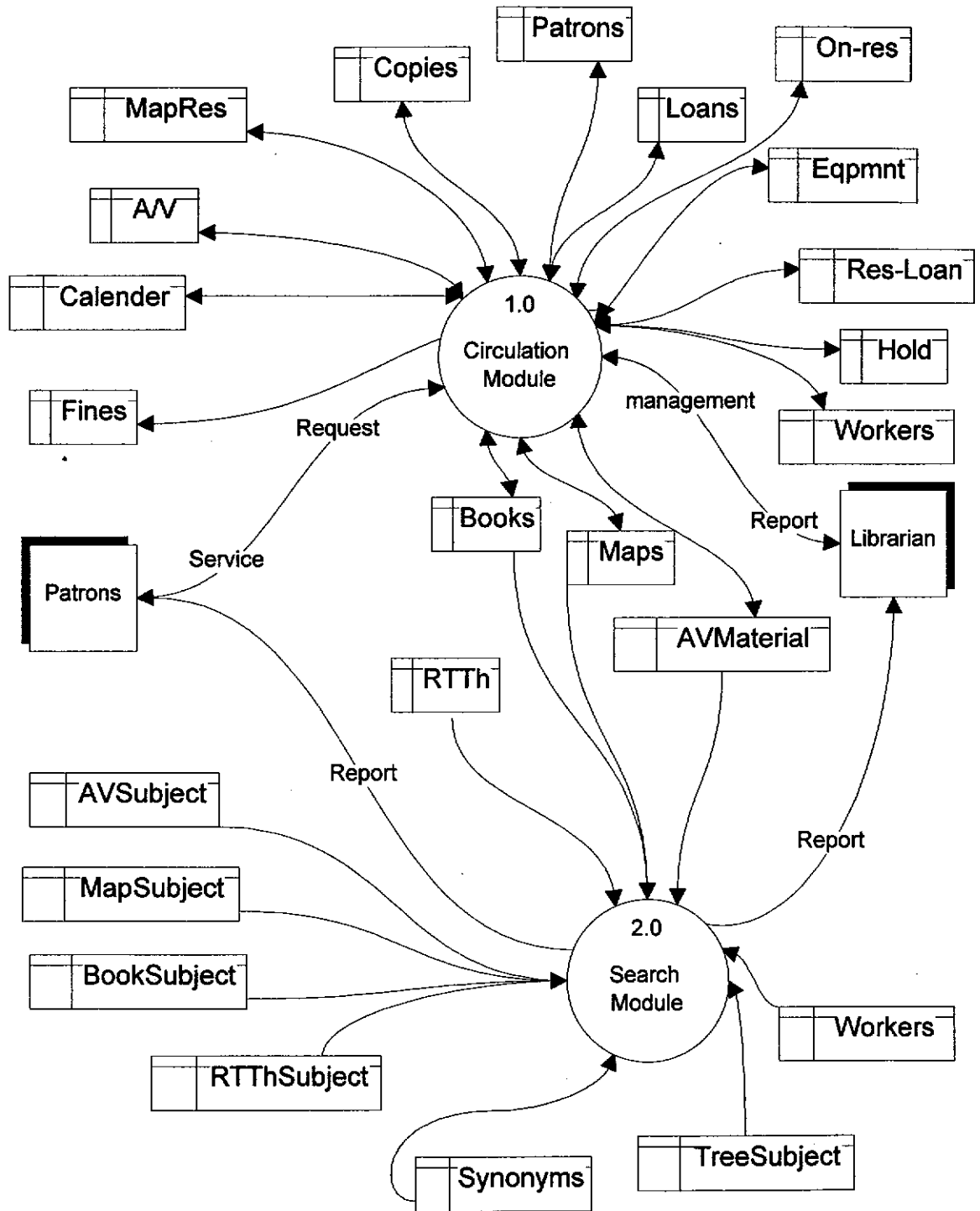
Context Diagram

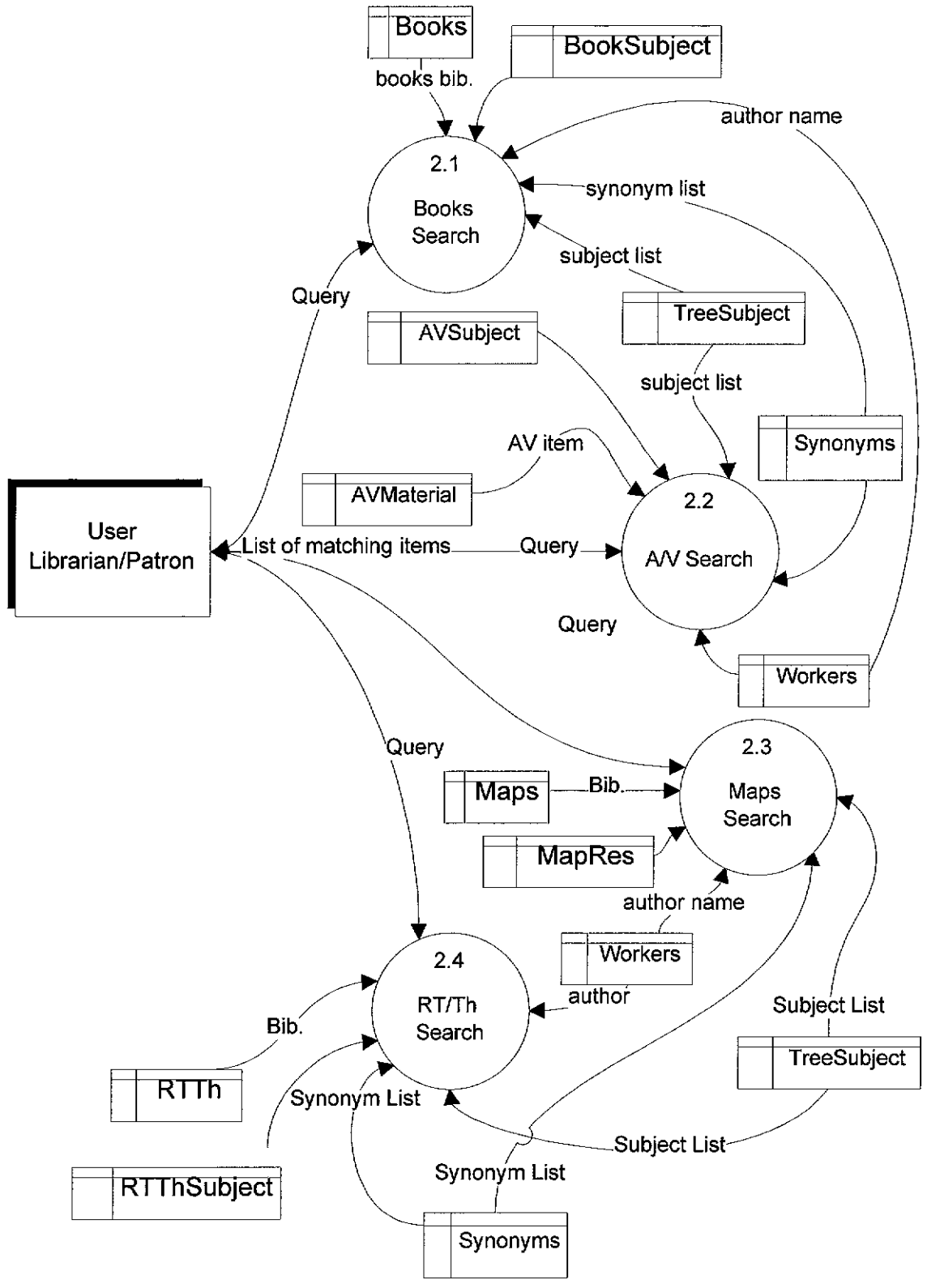


DFD Level 1

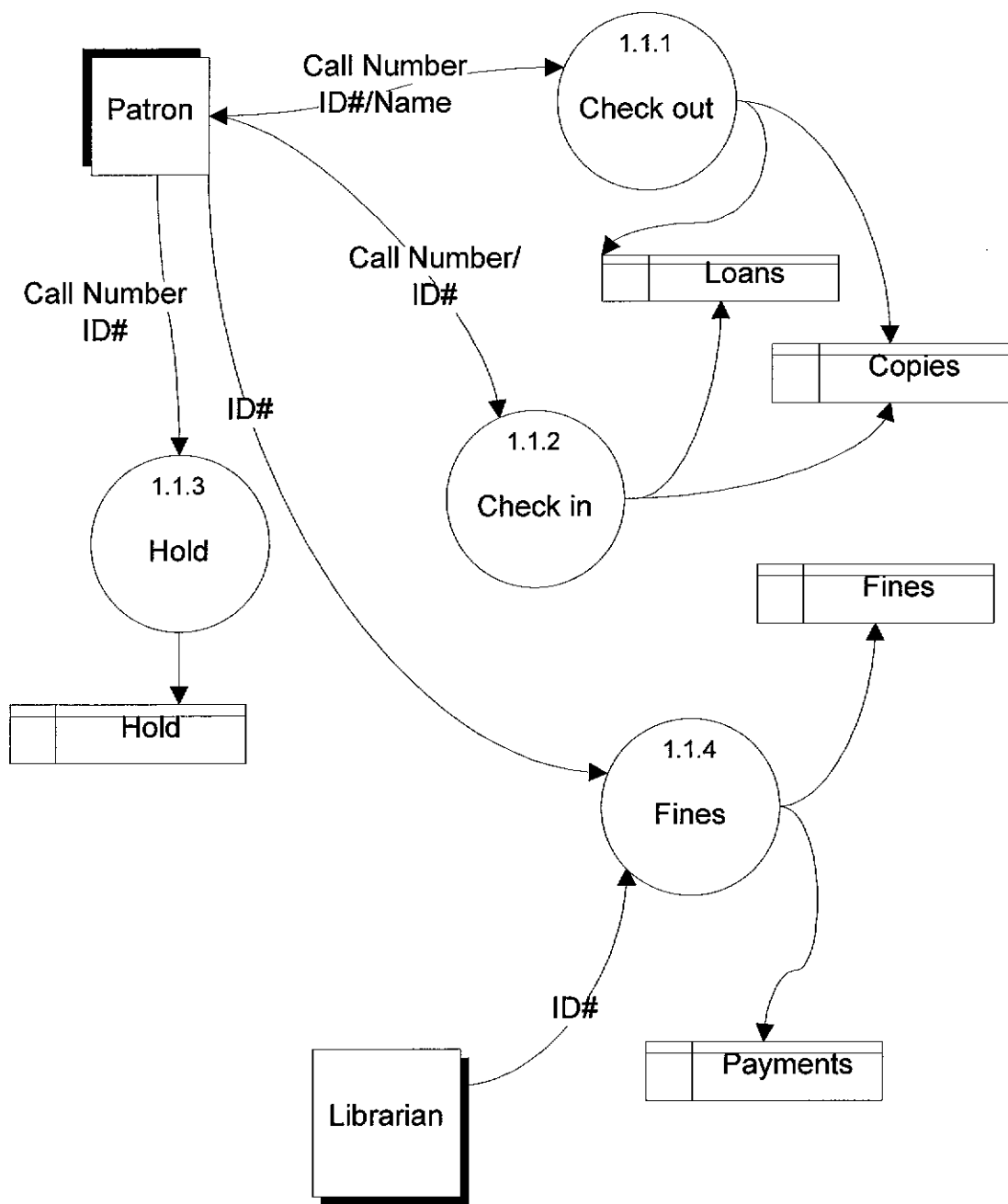


DFD Level 1

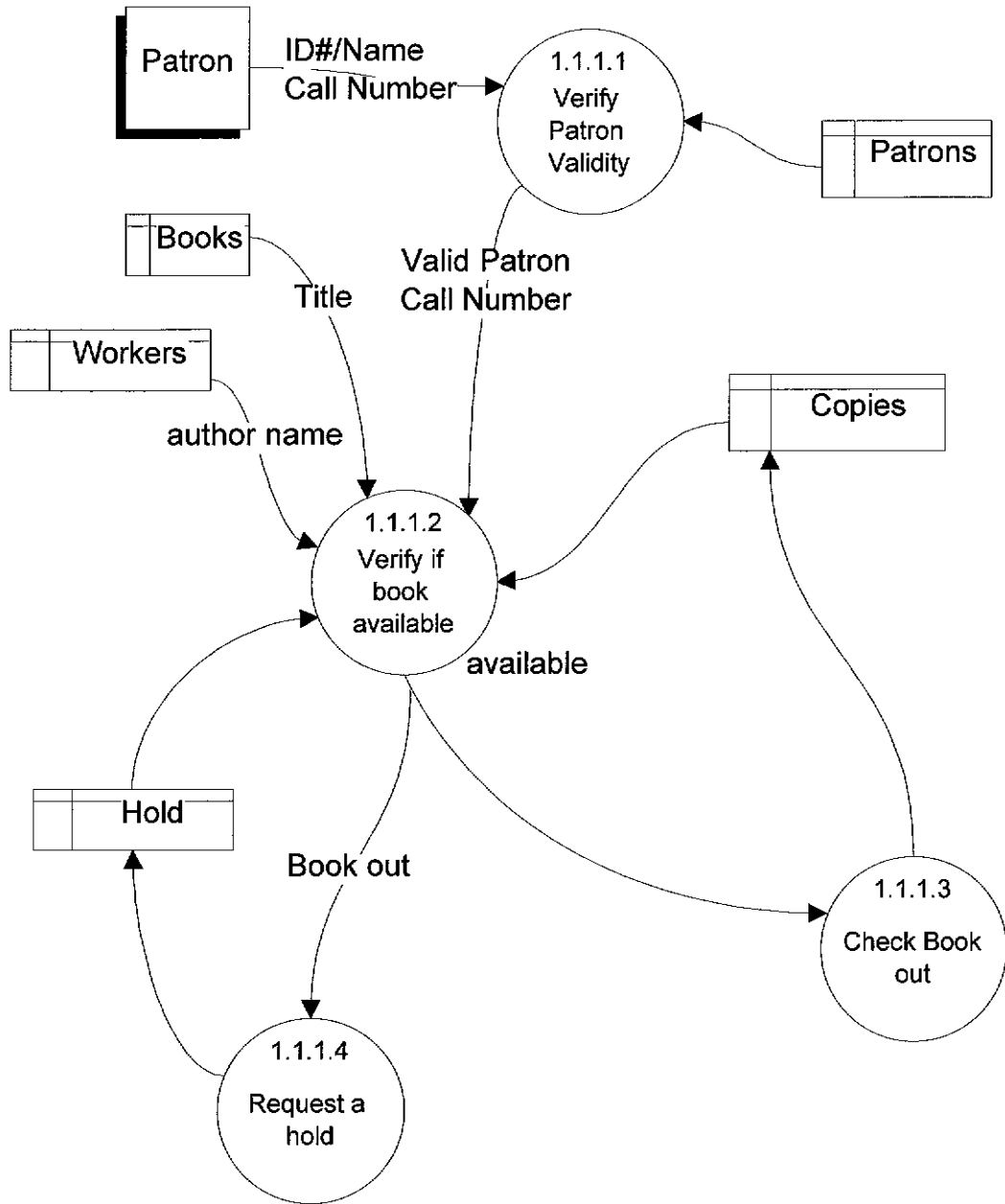




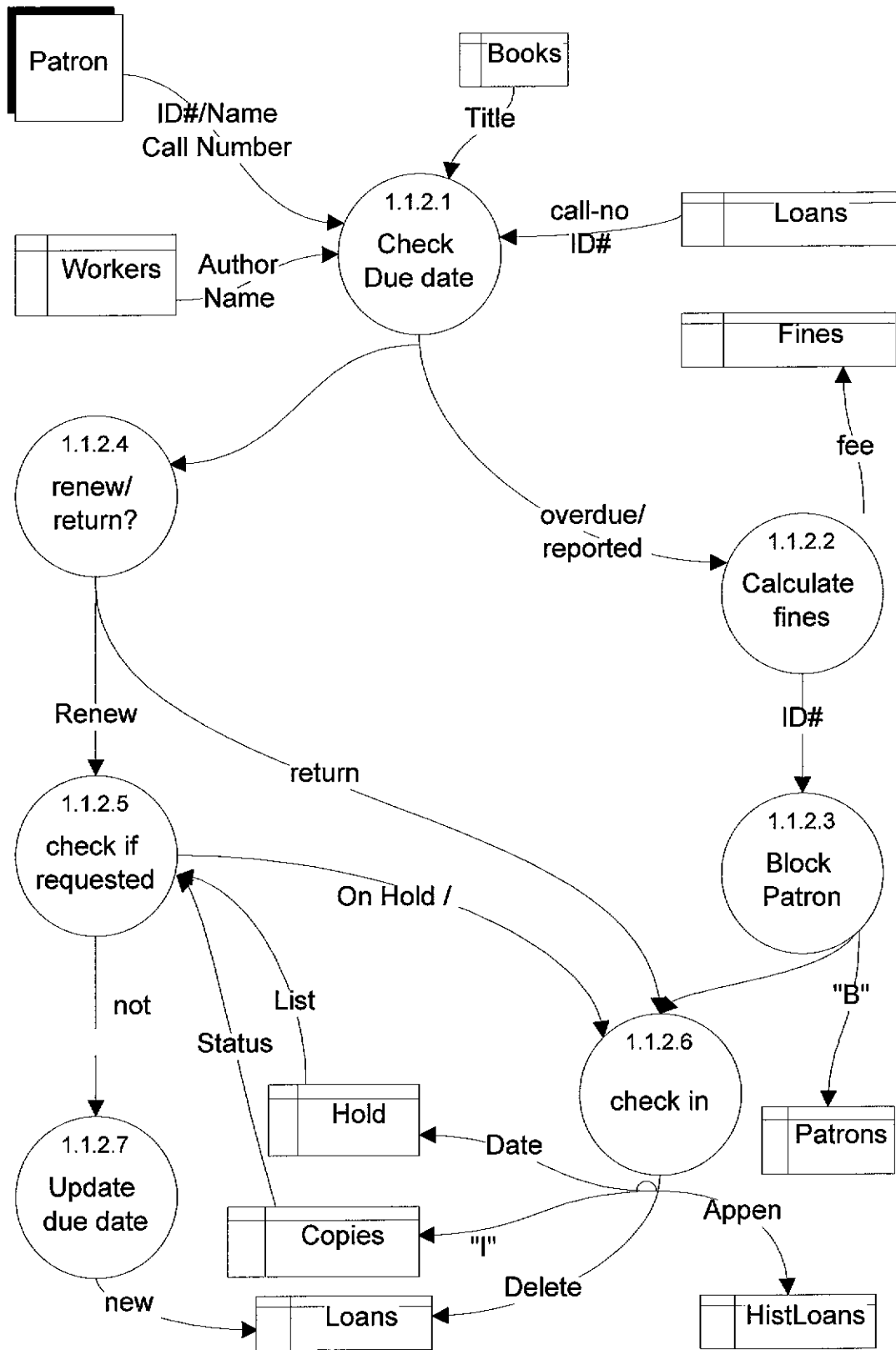
Search Module



Books Circulation Level 3

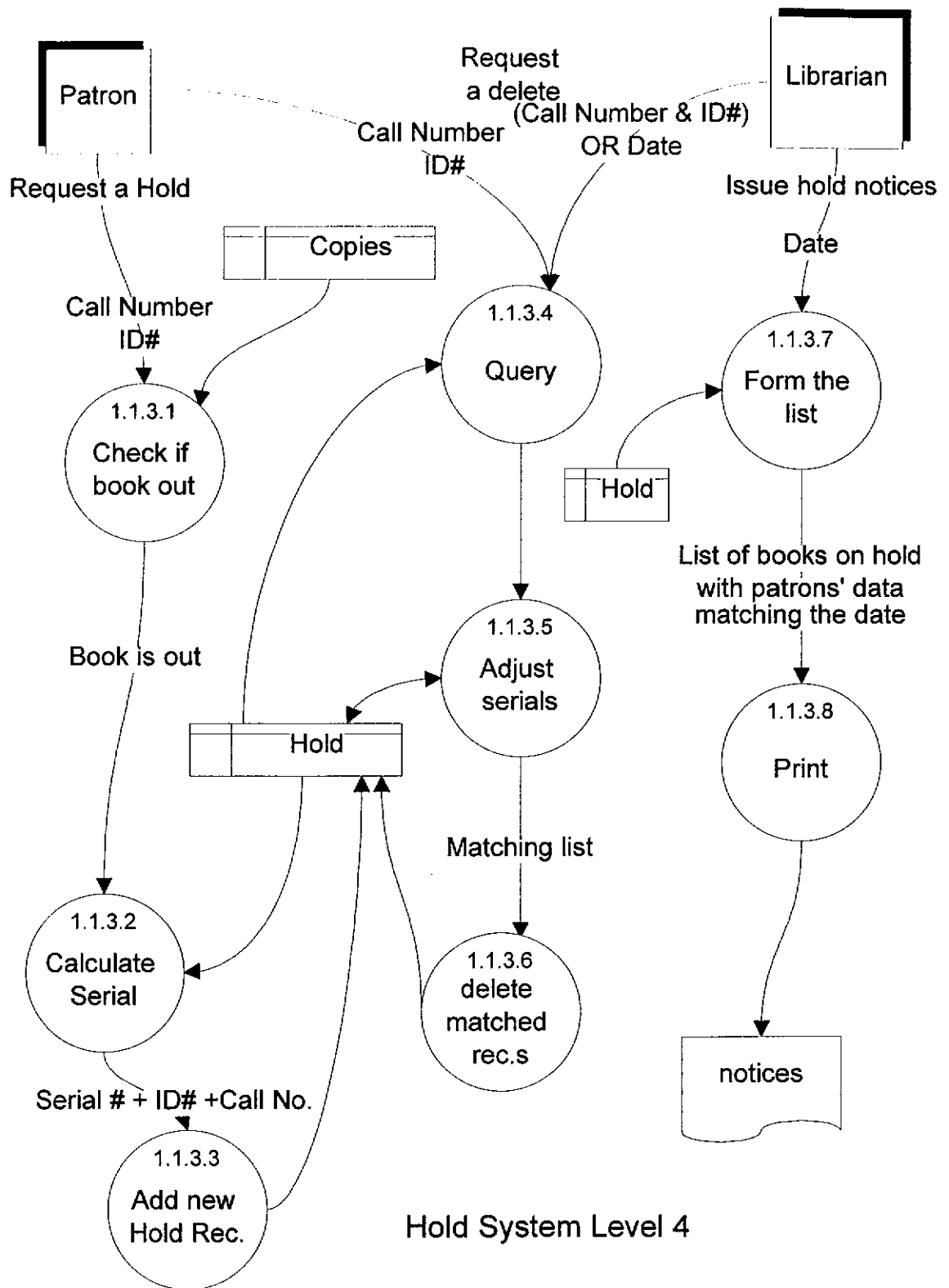


Check Book Out Level 4



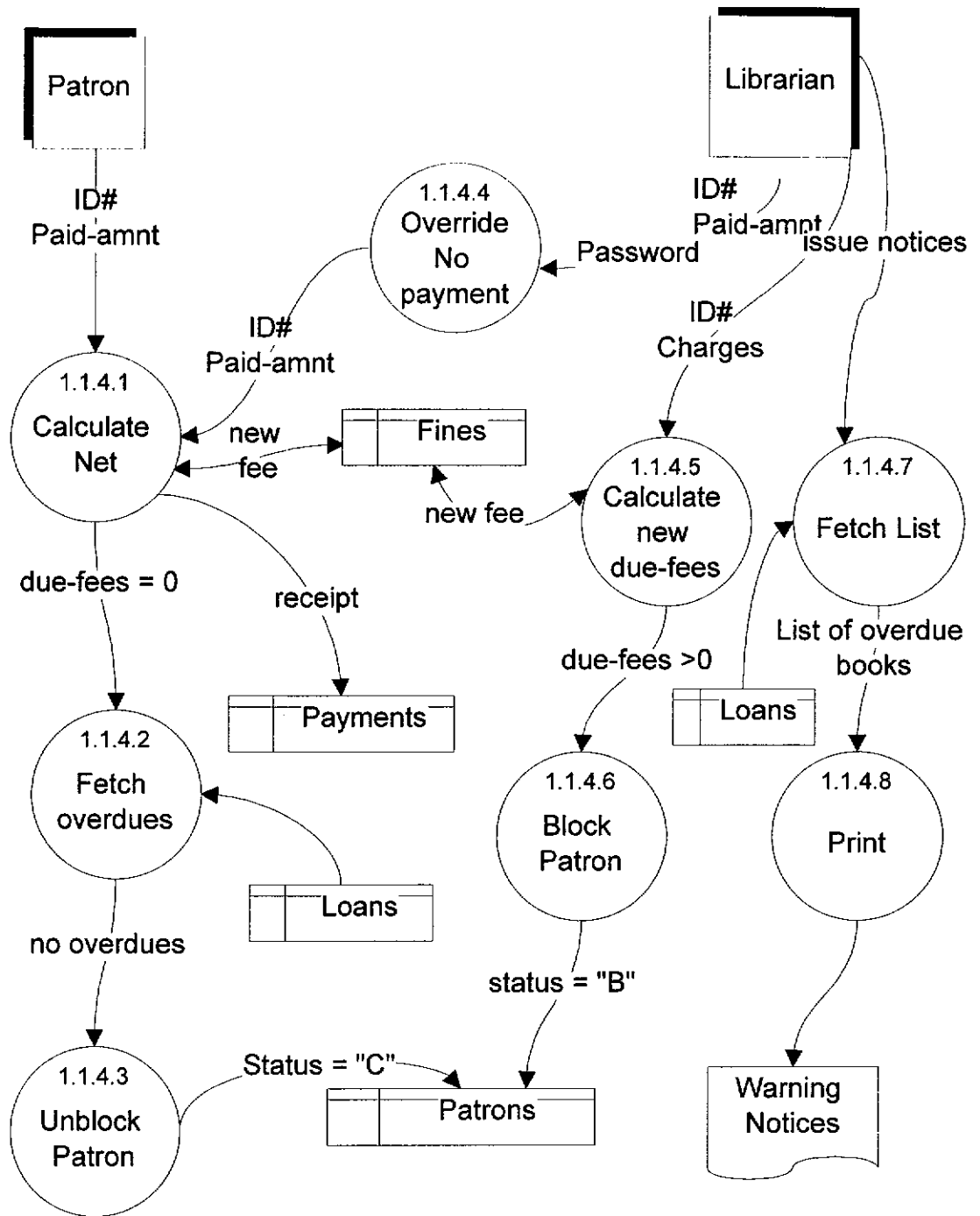
Check Book in Level

3 options : request a hold, delete holds, or print notices for books on hold

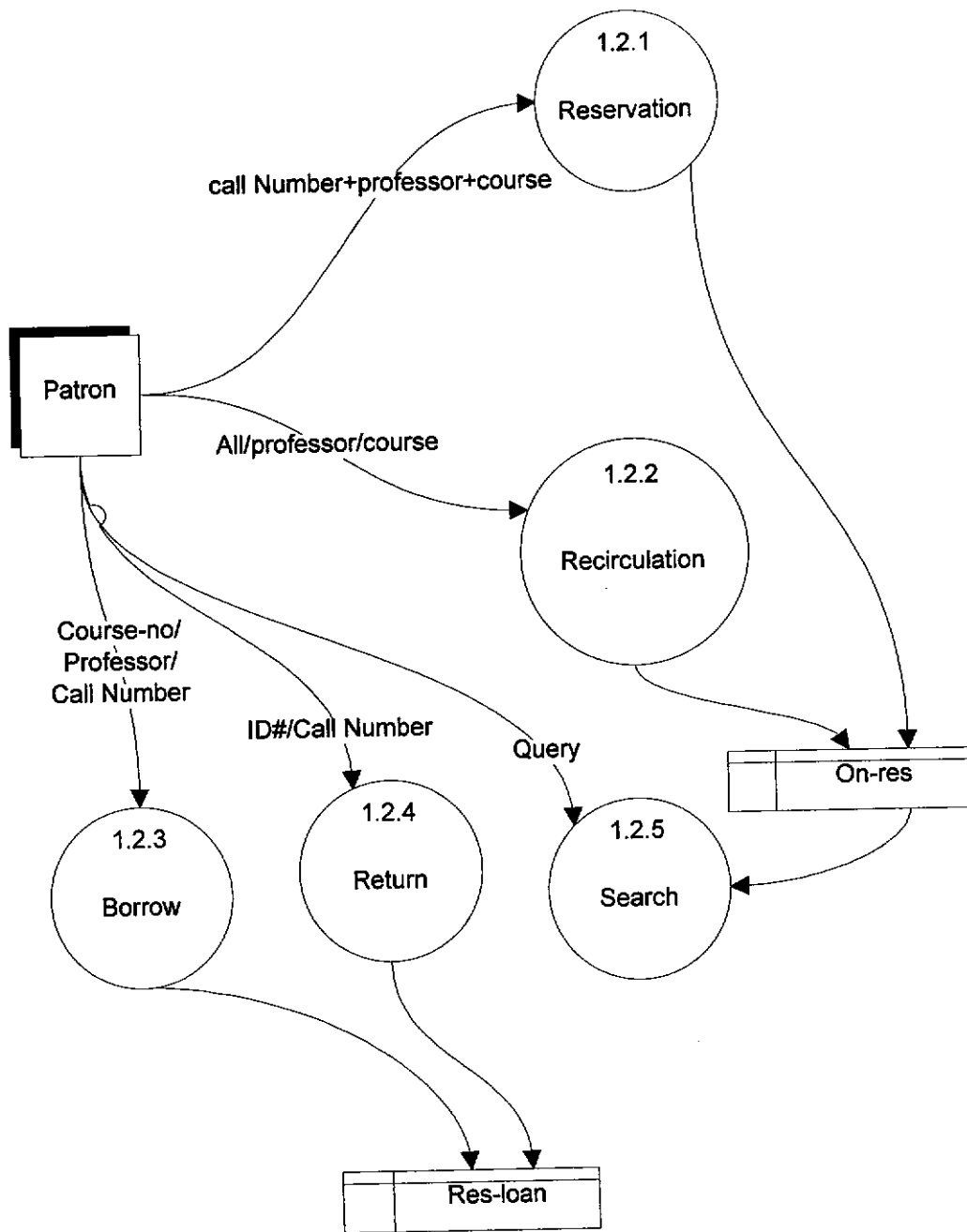


Hold System Level 4

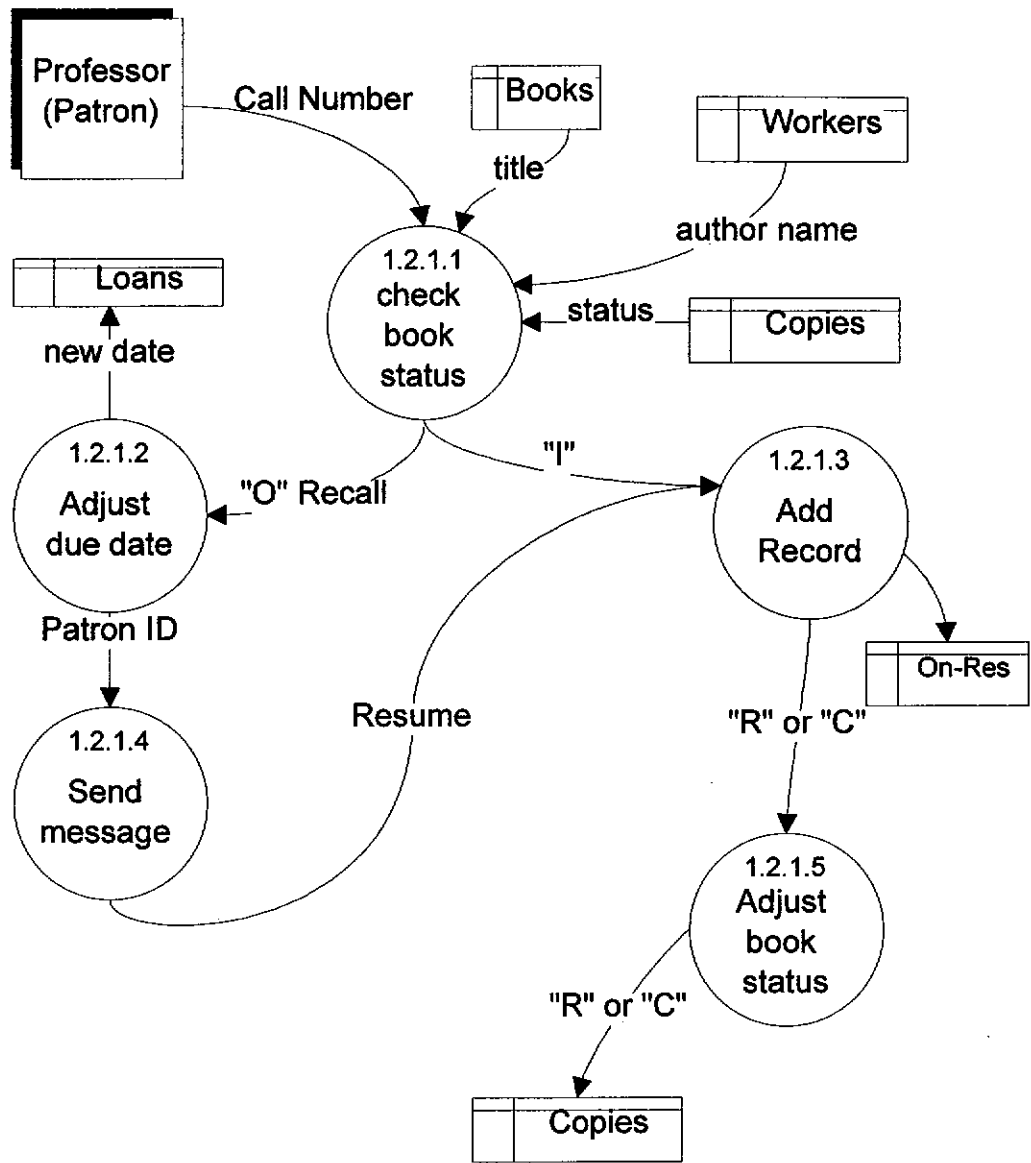
3 Options : Payments, Charges, or issue overdue warning messages



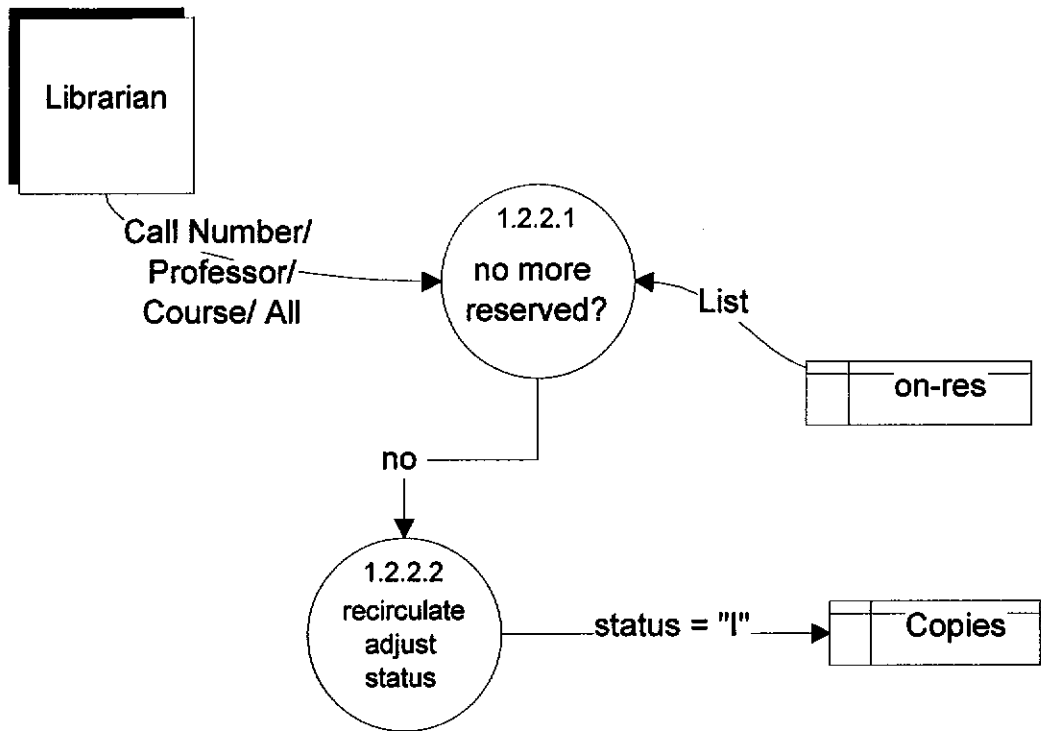
Fines submodule Level 4



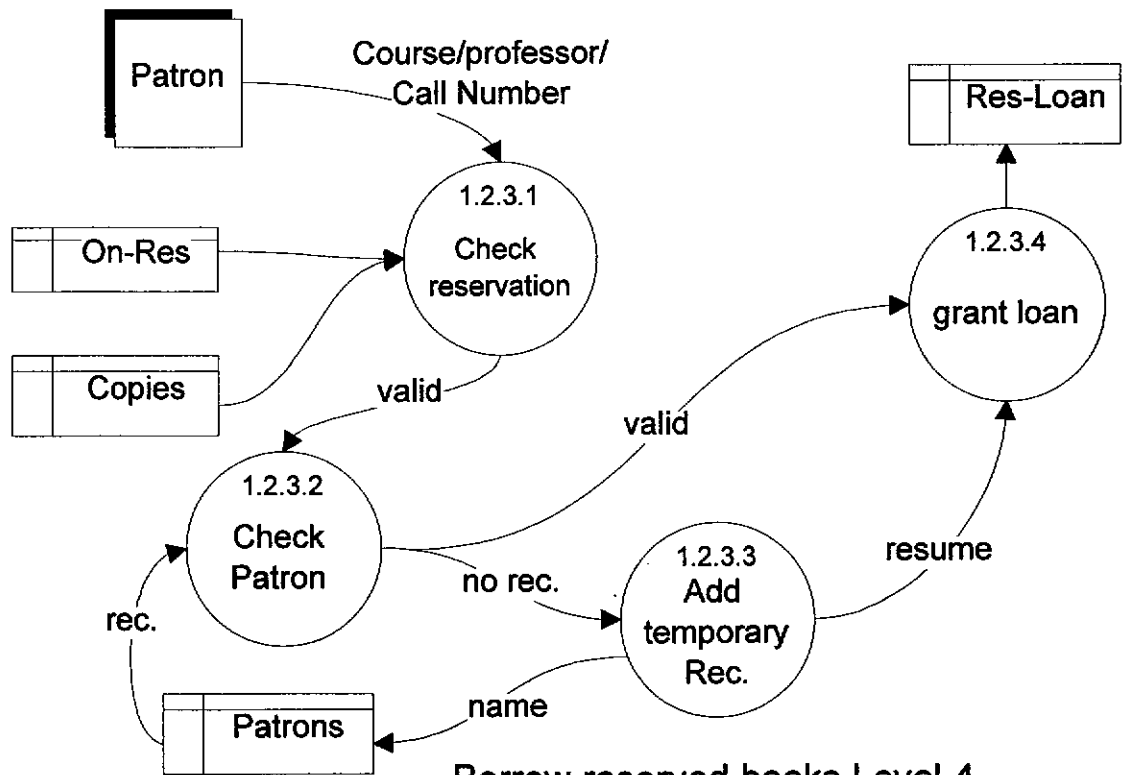
Reserve Room Level 3



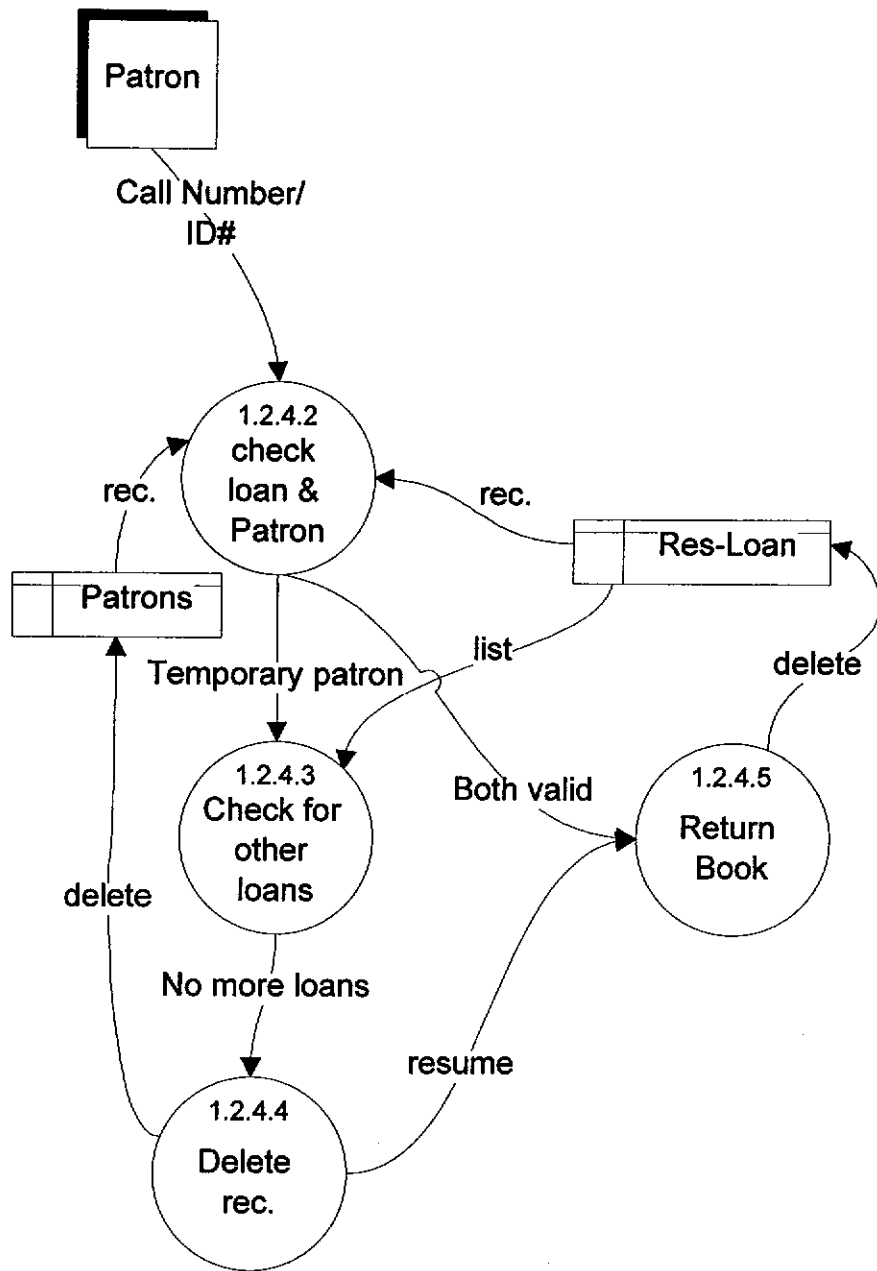
Book Reservation Level 4



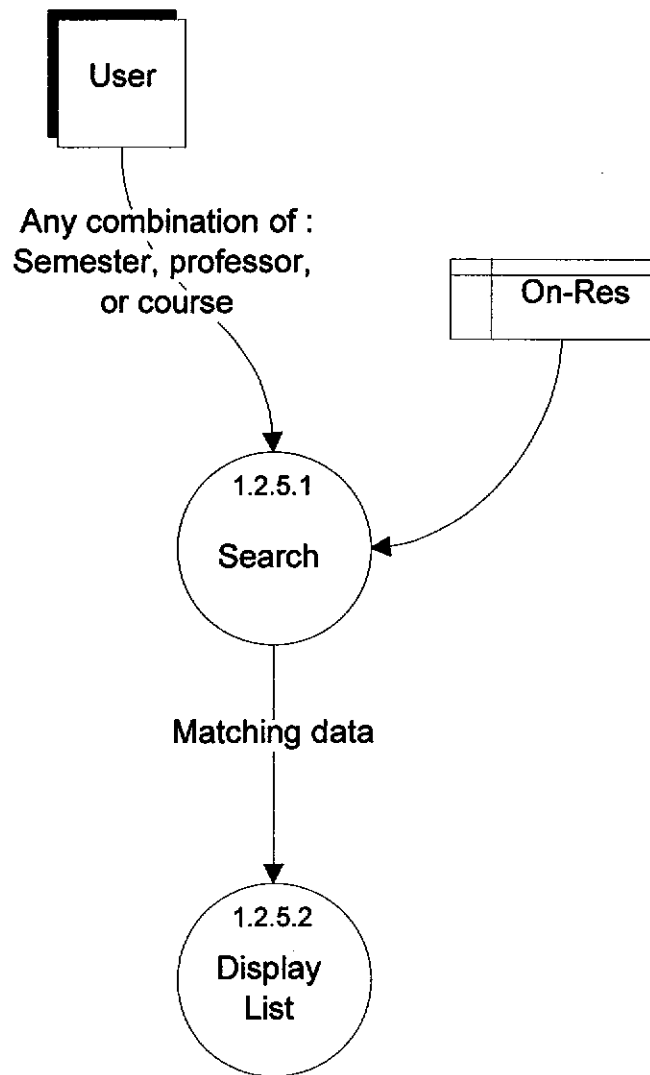
Recirculate Level 4



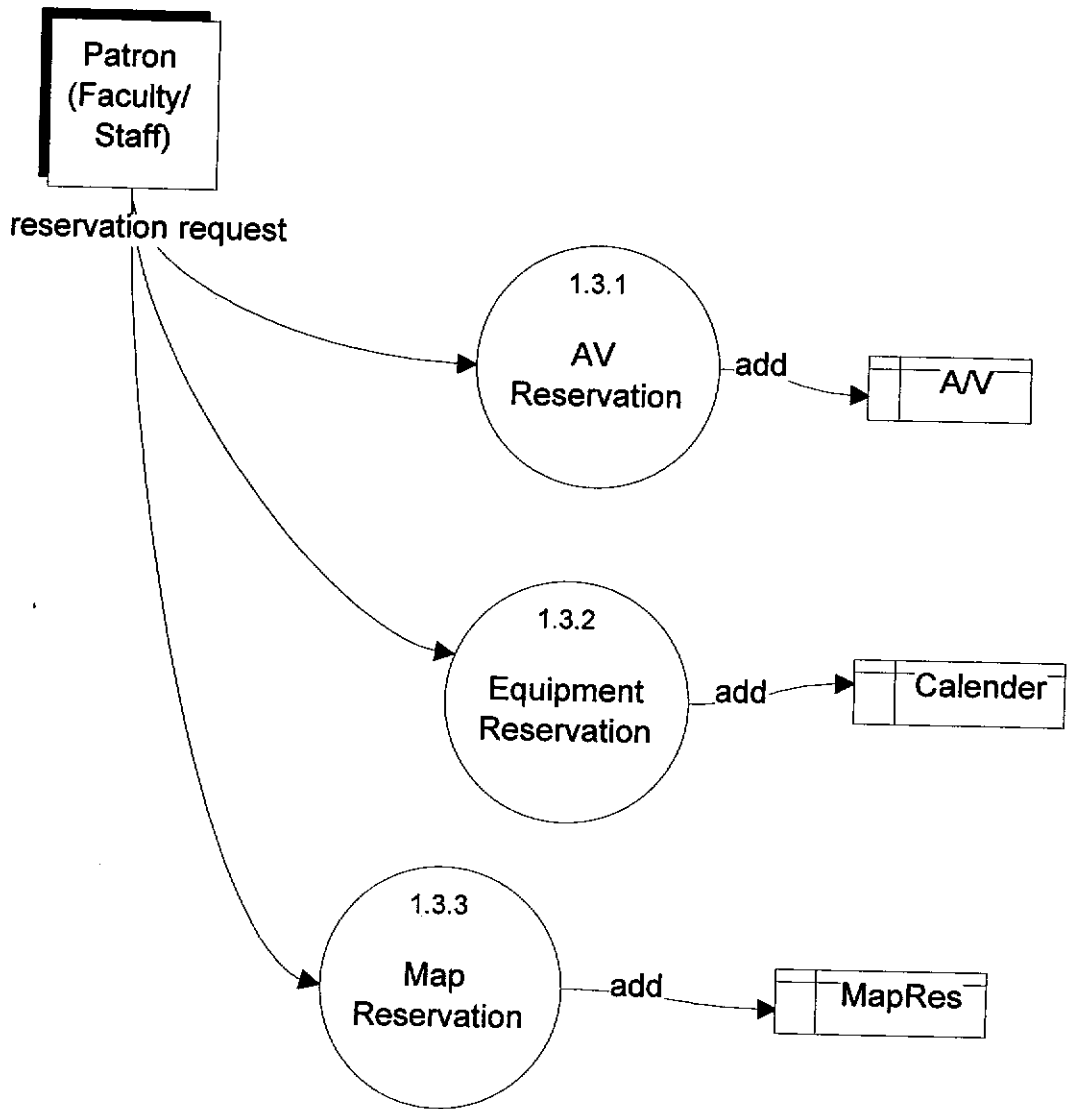
Borrow reserved books Level 4



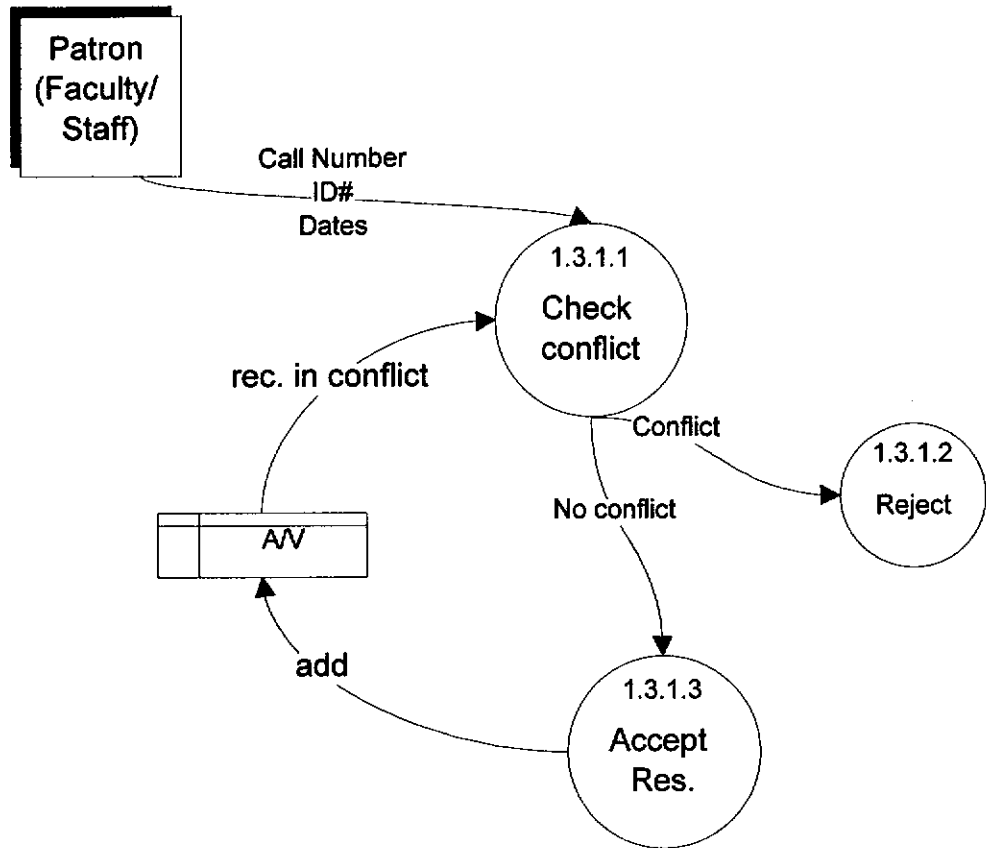
Return Book to reserve room Level 4



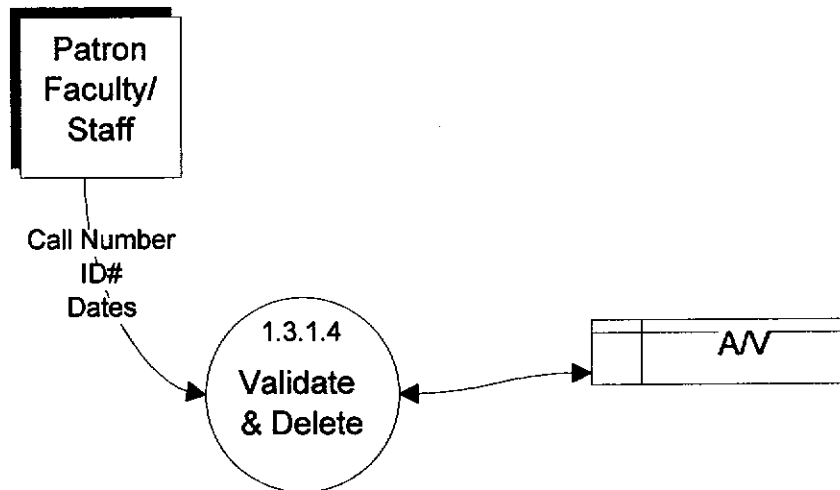
Search in reservation Level 4



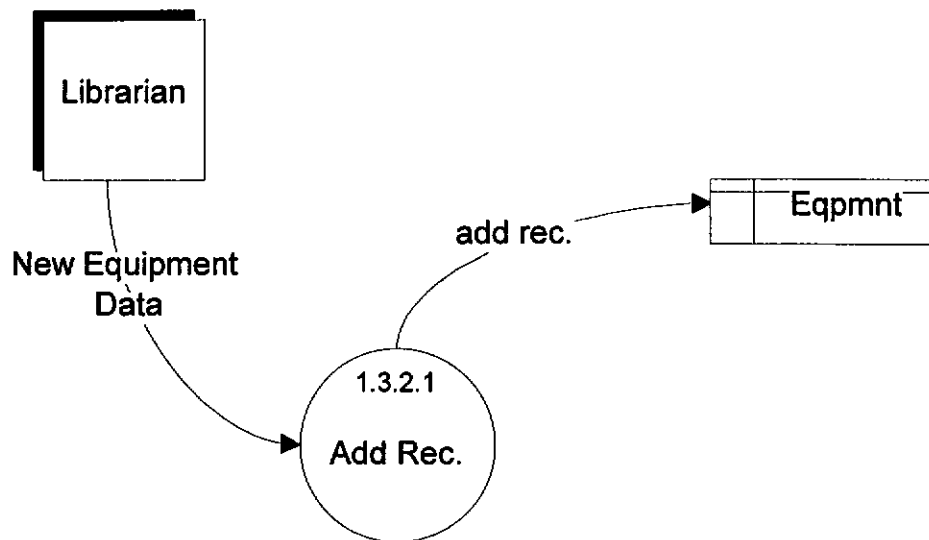
AV Circulation Level 3



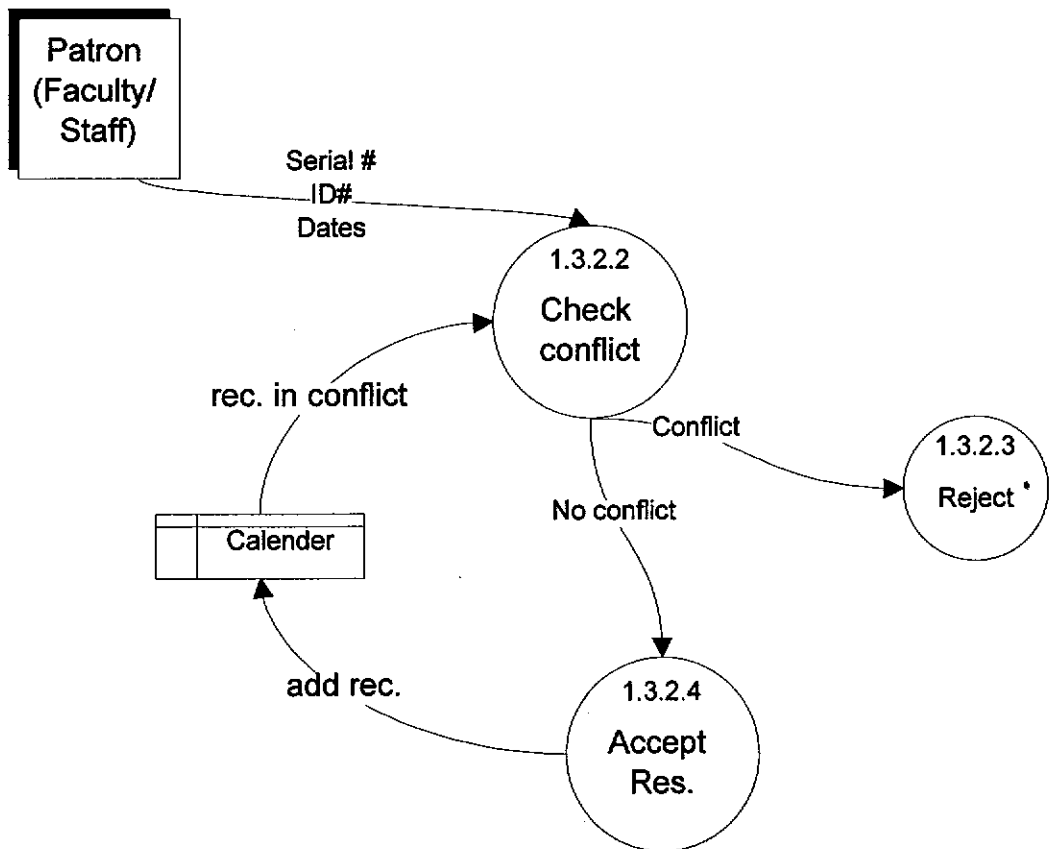
AV Reservation Level 4



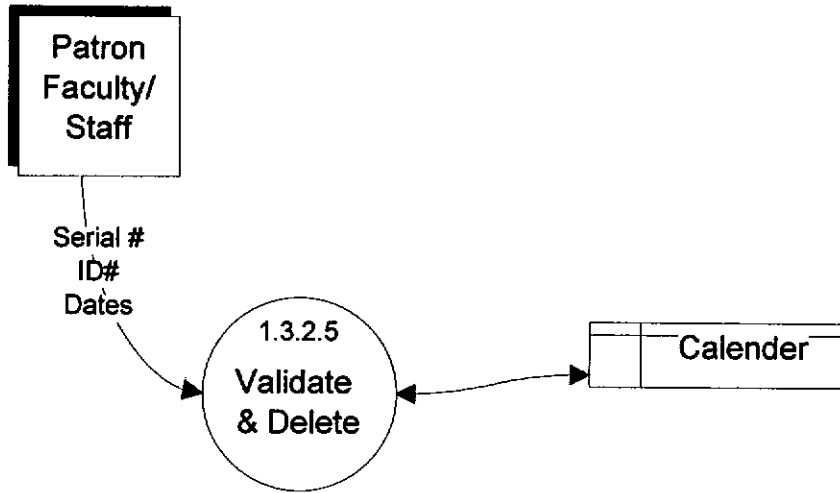
Delete AV Reservation Level 4



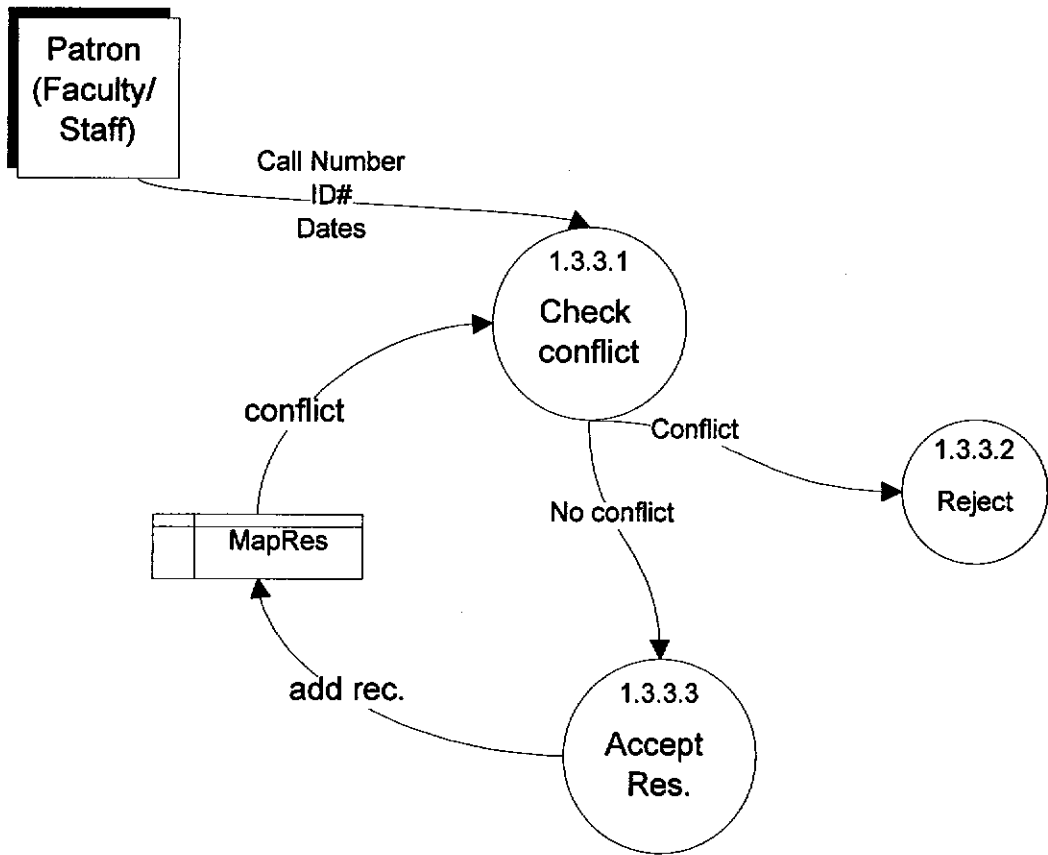
Equipment Inventory Level 4



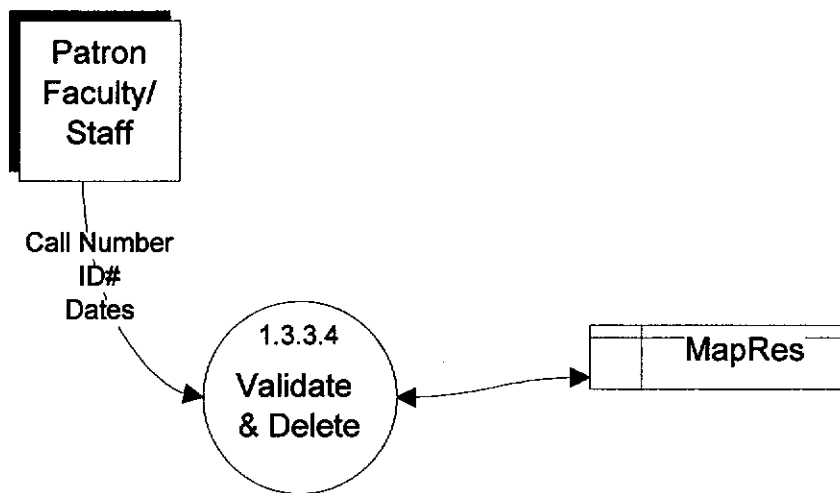
Equipment Reservation Level 4



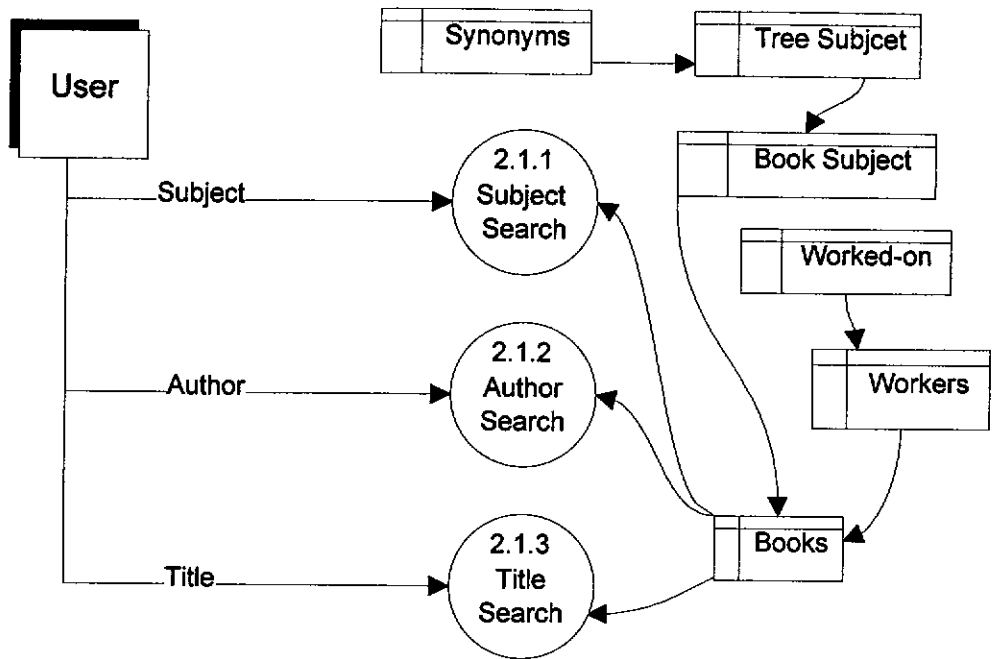
Delete Equipment Reservation Level 4



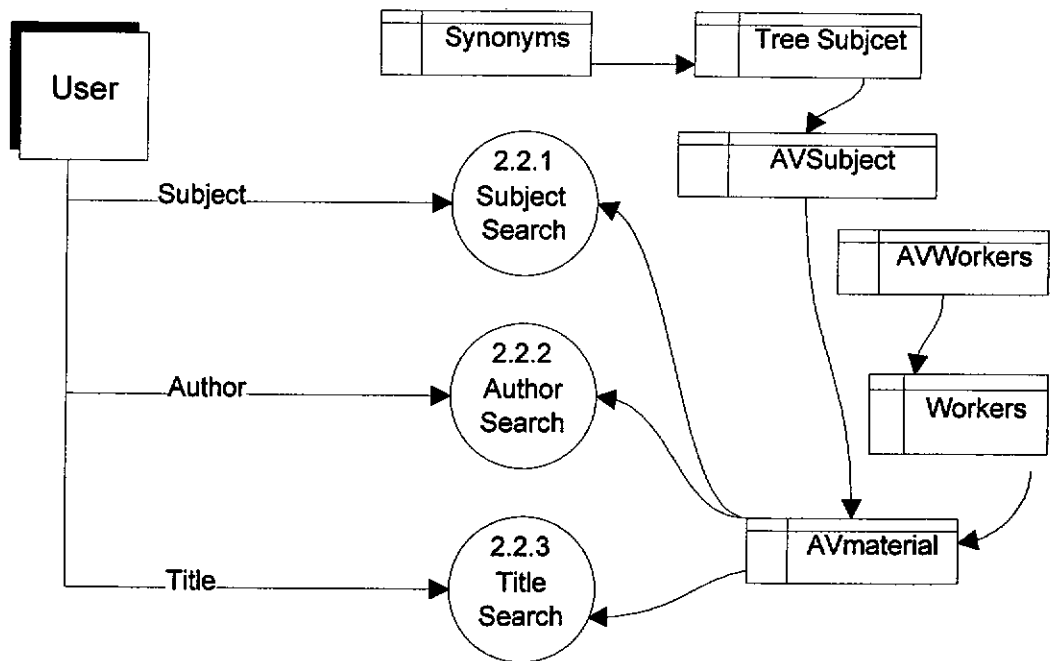
Map Reservation Level 4



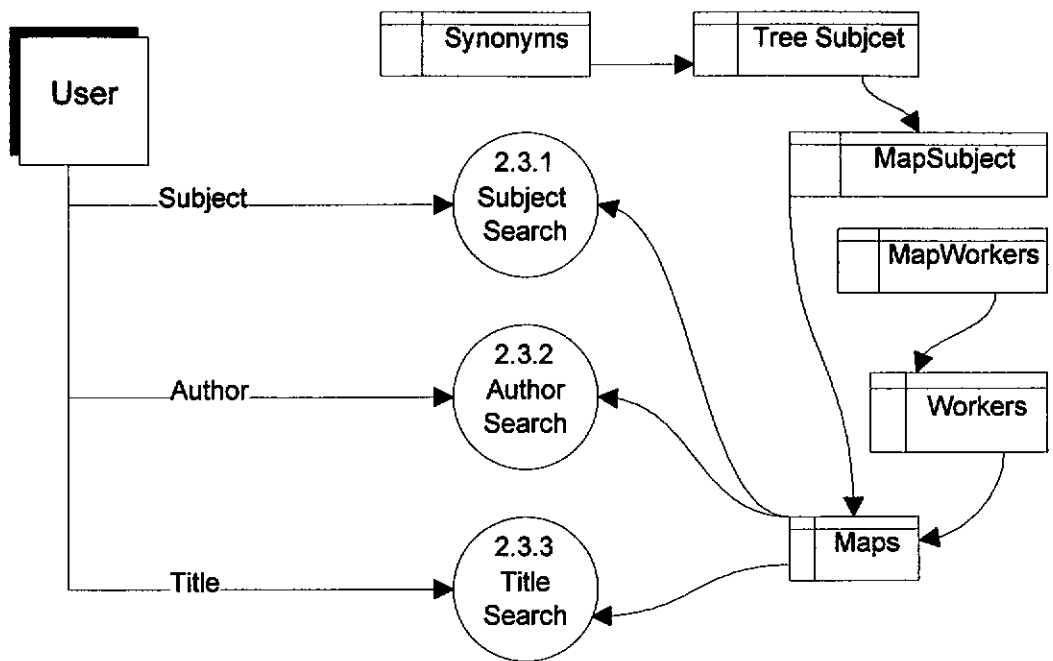
Delete Map Reservation Level 4



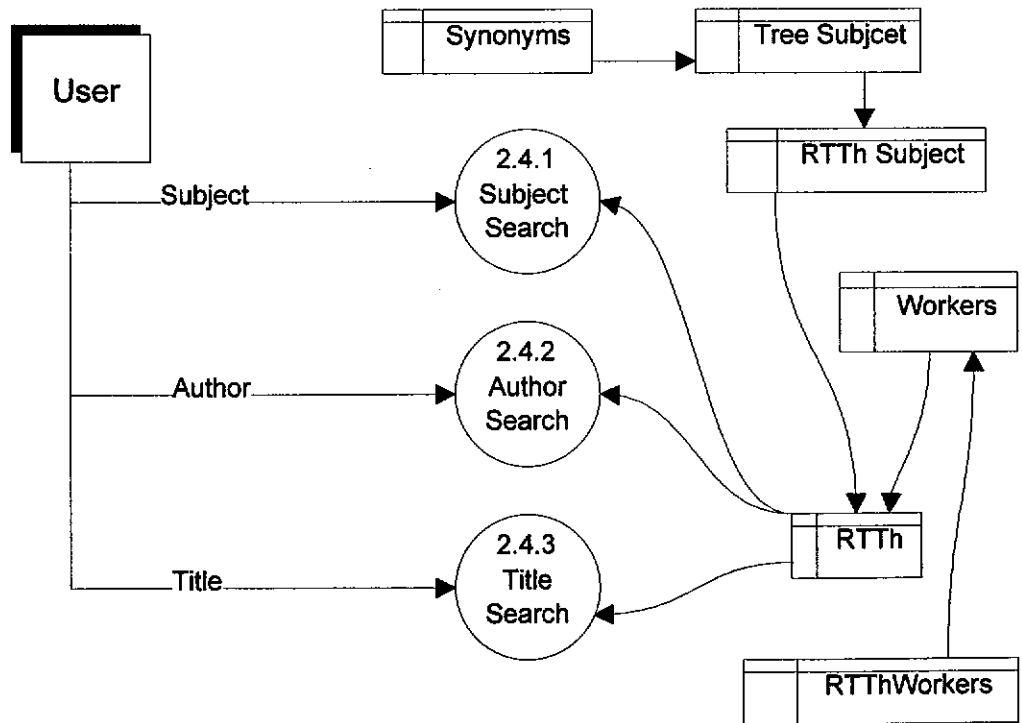
Books Search Level 3



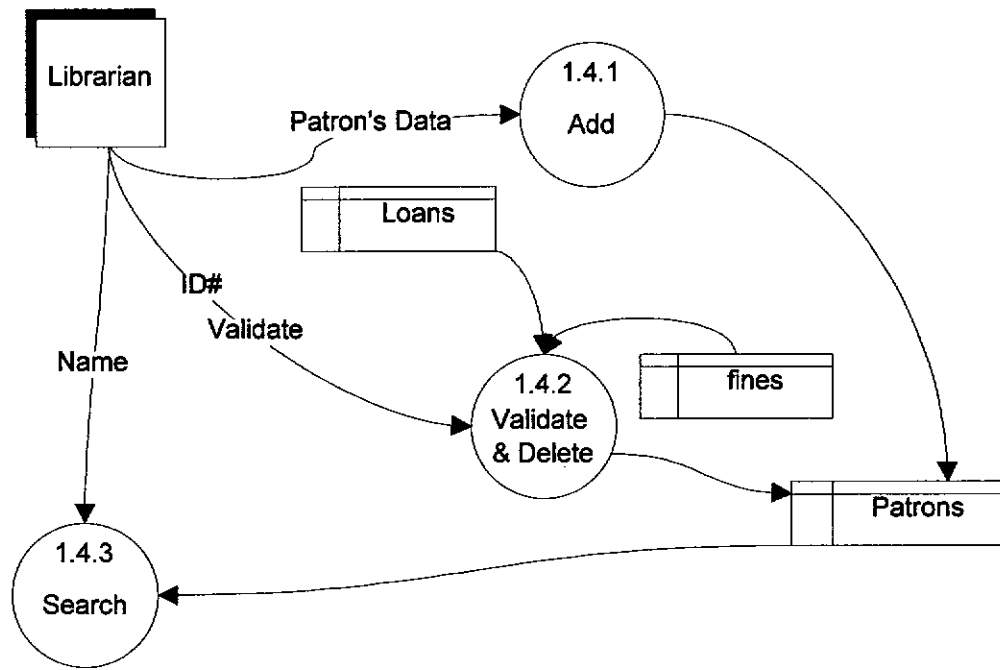
AV Search Level 3



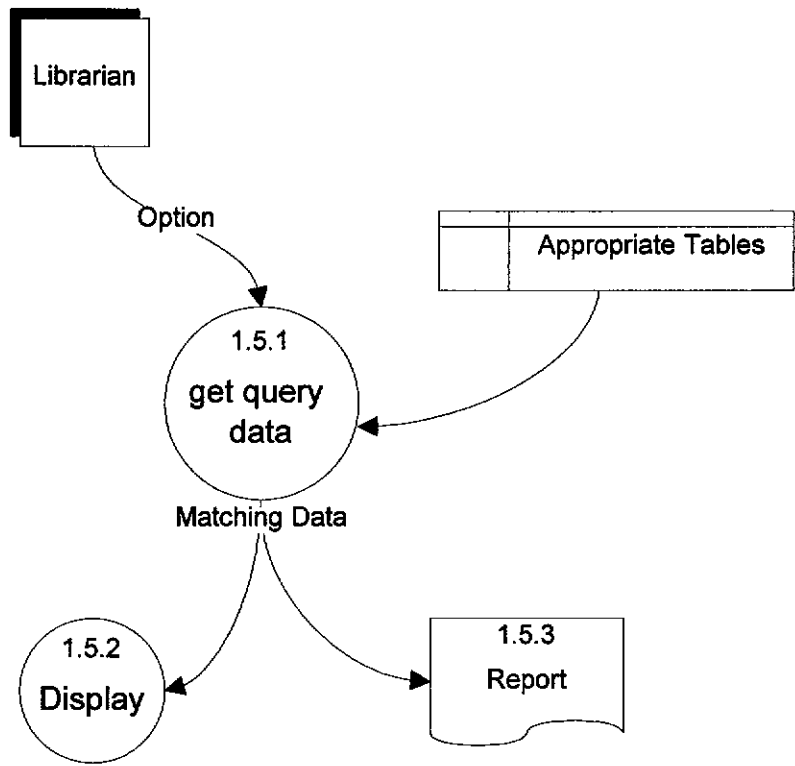
Maps Search Level 3



RTTh Search Level 3



Patrons Module Level 3



Report Module Level 3

Chapter 3

Design Issues

On the basis of the above analysis, tables and system modules were designed. This section will go through the tables and modules design.

3.1 Data Dictionary : Table Design

Note that fields, defined above in the analysis section, will not be redefined; moreover, fields repeated in more than one table will be defined only once and referred to in subsequent tables.

1. A/V

Primary Key : (Collection, Language, Format, Cutter, Part-no, Copy-no, FromDate)

The first six fields are the call number of an Audio/Visual material.

Indexes : Primary key, ID#.

Properties : Validation of dates ([FromDate] < [ToDate])

Due date of reservation should be strictly greater than the reservation date.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
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1. <u>Collection</u> :	Text (5)	“ ”
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2. <u>Language</u> :	Text (1)	“E”
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- Validation rule : ([Language] in (“E”, “G”, “F”, “A”)).

3. <u>Format</u> :	Text (5)	“ ”
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4. <u>Cutter</u> :	Text (6)	“”
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5. <u>Part-no</u> :	Byte (1)	1
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- Description : as explained earlier, an item may be composed of many parts. This field gives the specific part to be reserved.

6. <u>Copy-no</u> :	Byte (1)	0
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- Description : Since an item may have duplicates, this field specifies which copy to reserve.

7. <u>FromDate</u> :	Date + Time	Now()
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- Description : the exact starting date and time for reservation period

8. <u>ID#</u> :	Text (6)	“”
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- Description : the identification number of the patron

9. ToDate : Date + Time Now()

- Description : the exact ending date and time for reservation period

10. Division : Text (25) ""

- Description : Normally, an A/V material is reserved for specific course lecture, this field gives the division the course belongs to.

11. Place : Text (10) ""

- Description : where the lecture is going to be given

2. ArchPatron

It has the same structure as the "Patrons" table; so please refer to patrons tables for further details.

Primary Key : (ID#).

3. AVMaterial

Primary Key : (Collection, Language, Format, Cutter).

Indexes : Primary Key, Collection, Cutter, Format, Language, Title.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>Collection</u> :	Text (5)	" "
2. <u>Language</u> :	Text (1)	"E"
- Validation rule : ([Language] in ("E", "G", "F", "A")).		
3. <u>Format</u> :	Text (5)	" "
4. <u>Cutter</u> :	Text (6)	" "
5. <u>Copies</u> :	Byte (1)	1
- Description : the total number of copies		
6. <u>Parts</u> :	Byte (1)	1
- Description : the total number of parts		
7. <u>Title</u> :	Text (255)	
- Description : the title and subtitle of the item		
8. <u>PubPlace</u> :	Text (50)	
- Description : the publication place of the item		
9. <u>PubID</u> :	Number (long)	0
- Description : the ID number of publisher in the <i>publishers</i> table		

5. AVWorkers

Primary Key : (Collection, Language, Format, Cutter, workerID)

Collection, Language, Format, and Cutter link this table to AVMaterial table.

WorkerID Links this table to Workers table.

Indexes : Primary Key, Collection

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>Collection</u> :	Text (5)	“ ”
2. <u>Language</u> :	Text (1)	“E”
- Validation rule : ([Language] in (“E”, “G”, “F”, “A”)).		
3. <u>Format</u> :	Text (5)	“ ”
4. <u>Cutter</u> :	Text (6)	“ ”
5. <u>WorkerID</u> :	Number (Long)	
- Description : the ID of worker		
6. <u>Job-code</u> :	Text (5)	
- Description : a code that describes the kind of job the worker performed on this item, for example , Act means actor, LDir means director, and LComp means composer. Note that the “L” in the code denotes that the item is mainly recognized by this worker, and it is a must that each item to be recognized by exactly one leading worker. The description of codes is found in the Codes table.		

6. Books

Primary Key : (Collection, size, Type, Language, Format, DDC, Cutter).

Indexes : Primary Key, Collection, Language, Format, DDC, Cutter, Title.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>Collection</u> :	Text (5)	“ ”
2. <u>Size</u> :	True/False	False
3. <u>Type</u> :	True/False	False
4. <u>Language</u> :	Text (1)	“E”
- Validation rule : ([Language] in (“E”, “G”, “F”, “A”)).		
5. <u>Format</u> :	Text (5)	“ ”
6. <u>DDC</u> :	Text (20)	

7. Cutter : Text (6) 0
8. Vol-no : Number (Long) 0
- Description : the total number of volumes for this book
9. Copies : True/False False
- Description : Does it have more than one copy ?
10. Title : Text (255)
- Description : the title and subtitle of the book
11. PubPlace : Text (50)
- Description : the publication place of the book
12. PubID : Number (long) 0
- Description : the ID number of publisher in the *publishers* table
13. PubDate : year (4)
- Description : the publication year
14. Collation : Text (50)
- Description : number of preliminary pages, number of pages, size
15. SeriesName : Text (50)
- Description : series name (if any)
16. SeriesNumber : Byte (1) 0
- Description : series number (if a series)
17. Bibliography : Text (50)
- Description : bibliographic information
18. DescNote : Text (50)
- Description : descriptive note
19. ISBNNumber : Text (50)
- Description : International standard book number, a unique number for each book and edition of a book
20. Congress : Text (50)
- Description : Library of Congress call number
21. MARC : True/False False
- Description : Is the book on Machine-readable cataloguing
22. EditionNumber : Text (20)
- Description : edition number writing found on card catalogues.

7. **BookSubject**

Primary Key : (Subject-no, Collection, Size, type, Language, format, DDC, Cutter)

Indexes : Primary Key, Collection, Cutter, Subject-no

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
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1. <u>Subject-no</u> :	Text (20)	
------------------------	-----------	--

- Format : "999.9999999999999999" the same as the DDC number

- Description : a subject number that uniquely identifies each subject in the tree of subjects.

2. <u>Collection</u> :	Text (5)	" "
------------------------	----------	-----

3. <u>Size</u> :	True/False	False
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4. <u>Type</u> :	True/False	False
------------------	------------	-------

5. <u>Language</u> :	Text (1)	"E"
----------------------	----------	-----

- Validation rule : ([Language] in ("E", "G", "F", "A")).

6. <u>Format</u> :	Text (5)	" "
--------------------	----------	-----

7. <u>DDC</u> :	Text (20)	
-----------------	-----------	--

8. <u>Cutter</u> :	Text (6)	" "
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8. **Calender**

Primary Key : (Serial#, FromDate)

Indexes : Primary Key, ID#, Serfrom(Serial#, FromDate), SerTo(Serial#, FromDate)

Properties : Validation of dates ([FromDate] < [ToDate])

Due date of reservation should be strictly greater than the reservation date.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
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1. <u>Serial#</u> :	Text (5)	" "
---------------------	----------	-----

- Description : a unique number identifying the equipment to be reserved.

2. <u>FromDate</u> :	Date + Time	Now()
----------------------	-------------	-------

- Description : the exact starting date and time for reservation period

3. <u>ID#</u> :	Text (6)	" "
-----------------	----------	-----

- Description : the identification number of the patron

4. <u>ToDate</u> :	Date + Time	Now()
--------------------	-------------	-------

- Description : the exact ending date and time for reservation period

5. Division : Text (25) ""

- Description : Normally, an A/V material is reserved for specific course lecture, this field gives the division the course belongs to.

6. Place : Text (10) ""

- Description : where the lecture is going to be given

9. Codes

Primary Key : (Code)

Indexes : Primary Key

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. <u>Code</u> :	Text (5)	
------------------	----------	--

2. <u>Description</u> :	Text (50)	
-------------------------	-----------	--

- Description : the code description

3. <u>No-Books</u> :	Byte (1)	0
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- Description : number of books allowed for a class of patrons, it is used only in case the code is for a class of patrons

4. <u>Duration</u> :	Byte (1)	0
----------------------	----------	---

- Description : number of weeks the patron is allowed to borrow a book. It cannot exceed 15 weeks i.e. a semester.

10. Copies

Primary Key : (Collection, Size, Type, Language, Format, DDC, Cutter, Vol-no, Copy-no)

Indexes : Primary Key, Collection

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. <u>Collection</u> :	Text (5)	""
------------------------	----------	----

2. <u>Size</u> :	True/False	False
------------------	------------	-------

3. <u>Type</u> :	True/False	False
------------------	------------	-------

4. <u>Language</u> :	Text (1)	"E"
----------------------	----------	-----

- Validation rule : ([Language] in ("E", "G", "F", "A")).

5. <u>Format</u> :	Text (5)	""
--------------------	----------	----

6. <u>DDC</u> :	Text (20)	
-----------------	-----------	--

7. Cutter : Text (6) ""
8. Vol-no : Byte (1) 0
- Description : the number of the volume (if any)
9. Copy-no : Byte (1) 0
- Description : copy number (if there is more than 1 copy)
10. DatePurchased : Date (dd/mm/yyyy)
- Description : date of purchase of the book
11. PurchasePrice : Currency (8) 0
- Description : purchase price of the book
12. Status : Text (3) "I"
- Description : tells the status of the book which can be :

Status Code	Meaning
I	book is on the library shelves
O	book is out with a patron
H	book is put on hold upon a patron request
R	book is on reserve shelves
C	book is recalled to be put on reserve
Msg	book is missing (i.e. lost by a patron)
DL	book is dead loan

13. DealerID : Number (long) 0
- Description : ID of the dealer that supplied the book. This field links the Copies table to the Dealers table.

11. Dealers

Primary Key : (Dealer-ID)

Indexes : Primary Key, Name, Postal code

- | <u>Field Name</u> | <u>Type(Size)</u> | <u>Default value</u> |
|--|-------------------|----------------------|
| 1. <u>Dealer-ID</u> : | Number (Long) | Auto increment |
| - Description : a serial number increased automatically by database. | | |
| 2. <u>Name</u> : | Text (50) | |

- Description : name of the dealer, often a company name

3. Address : Text (255)

4. City : Text (50)

5. State : Text (50)

6. Region : Text (50)

7. PostalCode : Text (20)

- Format : 00000\ -9999

8. Country : Text (50)

9. FaxNumber : Text (30)

10. Note : Memo

- Description : a memo field to write any special notes about the dealer.

12. Eqmmt

Primary Key : (Serial#)

Indexes : (Primary Key, AV-Eq-Type)

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
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1. <u>Serial#</u> :	Text (6)	
---------------------	----------	--

- Description : a combination of text and numbers to give each equipment a unique identification number.

2. <u>AV-Eq-Type</u> :	Text (50)	
------------------------	-----------	--

- Description : the name of the equipment

3. <u>FabDate</u> :	Date (yyyy)	
---------------------	-------------	--

- Description : fabrication date

4. <u>Purchase-Date</u> :	Date (dd/mm/yyyy)	Date()
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5. <u>Price</u> :	Double (8)	0
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6. <u>DealerID</u> :	Number (Long)	
----------------------	---------------	--

7. <u>Status</u> :	Text (5)	"ON"
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- Description : "ON" the equipment is in order

"OFF" the equipment is out of order.

13. Fines

Primary Key : (ID#)

Indexes : primary Key

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>ID#</u> :	Text (6)	
- Description : patron's identification number		
2. <u>Due-Fees</u> :	Double (8)	
- Description : total of due charges.		

14. HistLoans

Primary Key : (RecordNumber)

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>RecordNumber</u> :	Number (Long)	Auto increment
- Description : a serial number automatically incremented by the database.		

Since the remaining has the same structure as the Loans table, it will not be discussed here. Please refer to Loans table for further details.

15. Hold

Primary Key : (ID#, Collection, Size, Type, Language, Format, DDC, Cutter, vol-no)

Indexes : Primary Key, Collection, ID#, HoldDate, CallNo (Collection, Size, Type, Language, Format, DDC, Cutter, Vol-No)

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>ID#</u> :	Text (6)	
- Description : Patron's ID number		
2. <u>Collection</u> :	Text (5)	“ ”
3. <u>Size</u> :	True/False	False
4. <u>Type</u> :	True/False	False
5. <u>Language</u> :	Text (1)	“E”
- Validation rule : ([Language] in (“E”, “G”, “F”, “A”)).		
6. <u>Format</u> :	Text (5)	“ ”
7. <u>DDC</u> :	Text (20)	
8. <u>Cutter</u> :	Text (6)	“”
9. <u>Vol-No</u> :	Byte (1)	0
10. <u>Serial</u> :	Byte (1)	0

- Description : the position of the patron in the waiting queue

11. HoldDate : Date (8) Null

- Description : the date the requested book is actually on hold for the patron. The book is put on hold for a patron when the book is checked in and it is his turn in the queue.

16. Loans

Primary Key : (Collection, Size, Type, Language, Format, DDC, Cutter, Vol-No, Copy-No)

Indexes : Primary Key, collection, ID#.

Properties : Validate dates ([Check-Out-Date]<=[DueDate])

Due date of a loan should be greater than or equal to check out Date of loan.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>Collection</u> :	Text (5)	“ ”
2. <u>Size</u> :	True/False	False
3. <u>Type</u> :	True/False	False
4. <u>Language</u> :	Text (1)	“E”
- Validation rule : ([Language] in (“E”, “G”, “F”, “A”)).		
5. <u>Format</u> :	Text (5)	“ ”
6. <u>DDC</u> :	Text (20)	
7. <u>Cutter</u> :	Text (6)	“”
8. <u>Vol-No</u> :	Byte (1)	0
9. <u>Copy-No</u> :	Byte (1)	0
10. <u>ID#</u> :	Text (6)	

- Description : Patron’s ID number

11. Check-Out-Date : Date (dd/mm/yyyy) Date()

- Description : the date the book was checked out

12. DueDate : Date (dd/mm/yyyy) Null

- Description : Due date of loan. Due date is calculated according to the patron’s class, and it can not exceed the end of the semester or to be equal to a Sunday.

13. Notice# : Byte (1) 0

- Description : in case of overdue, the patron is sent warning messages. This field keeps track on the number of messages sent. Its value is between 0 and 3.

17. MapRes

Primary Key : (Collection, Language, Format, DDC, Cutter, Copy-no, FromDate)

The first six fields are the call number of a map.

Indexes : Primary key, ID#, DDC.

Properties : Validation of dates ([FromDate] < [ToDate])

Due date of reservation should be strictly greater than the reservation date.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>Collection</u> :	Text (5)	“ ”
2. <u>Language</u> :	Text (1)	“E”
- Validation rule : ([Language] in (“E”, “G”, “F”, “A”)).		
3. <u>Format</u> :	Text (5)	“ ”
4. <u>DDC</u> :	Text (20)	
5. <u>Cutter</u> :	Text (6)	“”
6. <u>Copy-no</u> :	Byte (1)	0

- Description : Since a map may have duplicates, this field specifies which copy to reserve.

7. <u>FromDate</u> :	Date + Time	Now()
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- Description : the exact starting date and time for reservation period

8. <u>ID#</u> :	Text (6)	“”
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- Description : the identification number of the patron

9. <u>ToDate</u> :	Date + Time	Now()
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- Description : the exact ending date and time for reservation period

10. <u>Division</u> :	Text (25)	“”
-----------------------	-----------	----

- Description : Normally, a map is reserved for specific course lecture, this field gives the division the course belongs to.

11. <u>Place</u> :	Text (10)	“”
--------------------	-----------	----

- Description : where the lecture is going to be given.

18. Maps

Primary Key : (Collection, Language, Format, DDC, Cutter).

Indexes : Primary Key, Language, Format, DDC, Cutter, Title.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. Collection : Text (5) “ ”
2. Language : Text (1) “E”
- Validation rule : ([Language] in (“E”, “G”, “F”, “A”)).
3. Format : Text (5) “ ”
4. DDC : Text (20)
5. Cutter : Text (6) “ ”
8. Copies : Byte (1) 1
- Description : total number of copies
9. Title : Text (255)
- Description : the title and subtitle of the map
10. PubPlace : Text (50)
- Description : the publication place of the map
11. PubID : Number (long) 0
- Description : the ID number of publisher in the *publishers* table
12. PubDate : year (4)
- Description : the publication year
13. Collation : Text (50)
- Description : dimensions
14. SeriesName : Text (50)
- Description : series name (if any)
15. SeriesNumber : Byte (1) 0
- Description : series number (if a series)
16. Bibliography : Text (50)
- Description : bibliographic information
16. DescNote : Text (50)
- Description : descriptive note
17. Congress : Text (50)
- Description : Library of Congress call number
18. MARC : True/False False
- Description : Is the map on Machine-readable cataloguing
19. EditionNumber : Text (20)
- Description : edition number writing found on card catalogues.

20. MProjection : Text (50)

- Description : the style to be used for projection

21. Mform : Text (10)

- Description : map form.

19. MapSubject

Primary Key : (Subject-no, Collection, Language, format, DDC, Cutter)

Indexes : Primary Key, Collection, DDC, Cutter, Subject-no

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. <u>Subject-no</u> :	Text (20)	
------------------------	-----------	--

- Format : "999.9999999999999999" the same as the DDC number

2. <u>Collection</u> :	Text (5)	" "
------------------------	----------	-----

3. <u>Language</u> :	Text (1)	"E"
----------------------	----------	-----

- Validation rule : ([Language] in ("E", "G", "F", "A")).

4. <u>Format</u> :	Text (5)	" "
--------------------	----------	-----

5. <u>DDC</u> :	Text (20)	
-----------------	-----------	--

6. <u>Cutter</u> :	Text (6)	" "
--------------------	----------	-----

20. MapWorkers

Primary Key : (Collection, Language, Format, DDC, Cutter, workerID)

Collection, Language, Format, DDC, and Cutter link this table to Maps table.

WorkerID Links this table to Workers table.

Indexes : Primary Key, Collection, WorkerID

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. <u>Collection</u> :	Text (5)	" "
------------------------	----------	-----

2. <u>Language</u> :	Text (1)	"E"
----------------------	----------	-----

- Validation rule : ([Language] in ("E", "G", "F", "A")).

3. <u>Format</u> :	Text (5)	" "
--------------------	----------	-----

4. <u>DDC</u> :	Text (20)	
-----------------	-----------	--

5. <u>Cutter</u> :	Text (6)	" "
--------------------	----------	-----

6. <u>WorkerID</u> :	Number (Long)	
----------------------	---------------	--

- Description : the ID of worker

7. Job-code : Text (5)

- Description, please refer to AVWorkers for details.

21. Misc

Primary Key : no primary key.

Indexes : no indexes.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. <u>Semester</u> :	Text (8)	
----------------------	----------	--

- Description : the current semester

2. <u>SemStart</u> :	Date (dd/mm/yyyy)	
----------------------	-------------------	--

- Description : the starting date for the current semester

3. <u>SemEnd</u> :	Date (dd/mm/yyyy)	
--------------------	-------------------	--

- Description : the last date in the current semester

4. <u>SerialID</u> :	Byte (1)	0
----------------------	----------	---

- Description : serial to generate Ids for temporary patrons and patrons who do not have ID such as staff and some faculty members

5. <u>FullDB</u> :	True/False	False
--------------------	------------	-------

- Description : False the catalogues of items are still empty

True the catalogues of items were filled with data.

6. <u>Penalty</u> :	Single (4)	500
---------------------	------------	-----

- Description : penalty for delays per day per book.

22. On-Res

Primary Key : Prmry-Key

Indexes : Primary Key, Collection, Course-No, ProfID#, Semester,

Call-No(Collection, Size, Type, Language, Format, DDC, Cutter, Vol-no, Copy-No).

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. <u>Prmry-Key</u> :	Number (long)	Automatic increment
-----------------------	---------------	---------------------

- Description : due to restrictions on the number of fields for primary key by MS ACCESS , a serial number has been created to identify records. Else, the primary would had been : Course-No, Collection, Size, Type, Language, Format, DDC, Cutter, Vol-no, Copy-No, ProfID#, Semester.

2. Course-No : Text (6)

- Description : course number for which the book is on reserve shelf.

3. Collection : Text (5) “ ”

4. Size : True/False False

5. Type : True/False False

6. Language : Text (1) “E”

- Validation rule : ([Language] in (“E”, “G”, “F”, “A”)).

7. Format : Text (5) “ ”

8. DDC : Text (20)

9. Cutter : Text (6) “”

10. Vol-No : Byte (1) 0

11. Copy-No : Byte (1) 0

12. ProfID# : Text (6)

- Description : the professor identification number taken from the Patrons table

13. Semester : Text (8)

- Description : the name of the semester the book is reserved during.

23. Patrons

Primary Key : ID#.

Indexes : Primary Key, Last-Name, Ctgry, Regstrd.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. <u>ID#</u> :	Text (6)	
-----------------	----------	--

- Description : Identification number that uniquely identifies a patron. LAU students use their university Ids. Others the system generates one for them.

2. <u>First-Name</u> :	Text (15)	
------------------------	-----------	--

- Description : patron's first name

3. <u>Last-Name</u> :	Text (15)	
-----------------------	-----------	--

- Description : patron's last name

4. <u>Middle-Name</u> :	Text (3)	
-------------------------	----------	--

- Description : patron's father initial

5. <u>Box#</u> :	Integer (2)	
------------------	-------------	--

- Description : patron's box number at LAU, if any

6. Ctgrty : Text (5) "STD"

- Description : Patron's category, i.e., student, faculty, staff, or others. This field is linked to Codes table to specify the allowed number of books to borrow, and the duration.

7. Status : Text (1) "C"

- Description : Patron's status. "C" : Clear , the patron is allowed to use library facilities. "B" : the patron is blocked because he/she has due fees.

- Validation Rule : [status] = "C" or [status] = "B"

8. Regstrd : True/False False

- Description : registered or not , i.e. , a valid user of library facilities for current semester.

24. Payments

Primary Key : Receipt#

Indexes : Primary Key, ID#.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. <u>Receipt#</u> :	Integer (2)	0
----------------------	-------------	---

- Description : receipt number, it is manually entered by the user.

2. <u>ID#</u> :	Text (6)	
-----------------	----------	--

- Description : patron's ID

3. <u>Paid-amnt</u> :	Number (Double)	0
-----------------------	-----------------	---

- Description : the total paid amnt

- Validation Rule : [Paid-amnt] > 0

4. <u>Pay-Date</u> :	Date + Time	
----------------------	-------------	--

- Description : payment date and time to supervise income.

25. Publishers

Primary Key : (Pub-ID)

Indexes : Primary Key, Name, Postal code

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. <u>Pub-ID</u> :	Number (Long)	Auto increment
--------------------	---------------	----------------

- Description : a serial number increased automatically by database.

2. <u>Name</u> :	Text (50)	
------------------	-----------	--

- Description : name of the publisher, often a company name

3. Address : Text (255)

4. City : Text (50)

5. State : Text (50)

6. Region : Text (50)

7. PostalCode : Text (20)

- Format : 00000\ -9999

8. Country : Text (50)

9. FaxNumber : Text (30)

10. Note : Memo

- Description : a memo field to write any special notes about the publisher.

26. Res-Loan

Primary Key : (Collection, Size, Type, Language, Format, DDC, Cutter, Vol-No, Copy-No).

Indexes : Primary Key, Collection, ID#.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>ID#</u> :	Text (6)	
- Description : Patron's ID number		
2. <u>Collection</u> :	Text (5)	“ ”
3. <u>Size</u> :	True/False	False
4. <u>Type</u> :	True/False	False
5. <u>Language</u> :	Text (1)	“E”
- Validation rule : ([Language] in (“E”, “G”, “F”, “A”)).		
6. <u>Format</u> :	Text (5)	“ ”
7. <u>DDC</u> :	Text (20)	
8. <u>Cutter</u> :	Text (6)	“”
9. <u>Vol-No</u> :	Byte (1)	0
10. <u>Copy-No</u> :	Byte (1)	0
11. <u>LoanDate</u> :	Date+Time	Now()

- Description : the date the book was taken off shelf.

27. RTTh

Primary Key : (Collection, Language, Format, Cutter).

Indexes : Primary Key, Collection, Language, Format, Cutter, Title.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>Collection</u> :	Text (5)	“ ”
2. <u>Language</u> :	Text (1)	“E”
- Validation rule : ([Language] in (“E”, “G”, “F”, “A”)).		
3. <u>Format</u> :	Text (5)	“ ”
4. <u>Cutter</u> :	Text (6)	“”
8. <u>Vol-no</u> :	Number (Long)	0
- Description : the total number of volumes for this RT/Th		
9. <u>Copies</u> :	Byte (1)	0
- Description : the total number of copies		
10. <u>Title</u> :	Text (255)	
- Description : the title and subtitle of the RT/Th		
11. <u>PubPlace</u> :	Text (50)	
- Description : the publication place of the RT/Th		
12. <u>PubID</u> :	Number (long)	0
- Description : the ID number of publisher in the <i>publishers</i> table		
13. <u>PubDate</u> :	year (4)	
- Description : the publication year		
14. <u>Collation</u> :	Text (50)	
- Description : number of preliminary pages, number of pages, size		
15. <u>SeriesName</u> :	Text (50)	
- Description : series name (if any)		
16. <u>SeriesNumber</u> :	Byte (1)	0
- Description : series number (if a series)		
17. <u>Bibliography</u> :	Text (50)	
- Description : bibliographic information		
18. <u>DescNote</u> :	Text (50)	
- Description : descriptive note		
19. <u>ISBNNumber</u> :	Text (50)	

- Description : International standard book number, a unique number for each book and edition of a book

20. Congress : Text (50)

- Description : Library of Congress call number

21. MARC : True/False False

- Description : Is the book on Machine-readable cataloguing

22. EditionNumber : Text (20)

- Description : edition number writing found on card catalogues.

28. RTThSubject

Primary Key : (Subject-no, Collection, Language, format, Cutter)

Indexes : Primary Key, Collection, Cutter, Subject-no

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>Subject-no</u> :	Text (20)	
- Format : "999.9999999999999999" the same as the DDC number		
- Description : a subject number that uniquely identifies each subject in the tree of subjects.		
2. <u>Collection</u> :	Text (5)	" "
3. <u>Language</u> :	Text (1)	"E"
- Validation rule : ([Language] in ("E", "G", "F", "A")).		
4. <u>Format</u> :	Text (5)	" "
5. <u>Cutter</u> :	Text (6)	" "

29. RTThWorkers

Primary Key : (Collection, Language, Format, Cutter, workerID)

Collection, Language, Format, and Cutter link this table to AVMaterial table.

WorkerID Links this table to Workers table.

Indexes : Primary Key, Collection, WorkerID

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>Collection</u> :	Text (5)	" "
2. <u>Language</u> :	Text (1)	"E"
- Validation rule : ([Language] in ("E", "G", "F", "A")).		

3. Format : Text (5) “ ”

4. Cutter : Text (6) “”

5. WorkerID : Number (Long)

- Description : the ID of worker

6. Job-code : Text (5)

- Description : a code that describes the kind of job the worker performed on this RT/Th.

The description of codes is found in the Codes table.

30. Synonyms

Primary Key : (Synonym, Subject-No)

Indexes : Primary Key, Synonym, Subject-No

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. <u>Synonym</u> :	Text (50)	
---------------------	-----------	--

- Description : the synonym of the subject linked to by Subject-no in TreeSubject table.

2. <u>Subject-No</u> :	Text (20)	
------------------------	-----------	--

- Description : subject number of subject in TreeSubject table. It has the same format as the DDC.

31. TempLoans

Primary Key : (RecordNumber)

Indexes : Primary Key.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. <u>RecordNumber</u> :	Number (Long)	Auto increment
--------------------------	---------------	----------------

- Description : record number, a serial number automatically given by the system for each appended record.

The remaining structure is the same as that for Loans table.

32. TreeSubject

Primary Key : (Description)

Indexes : Primary Key, Subject-No

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
-------------------	-------------------	----------------------

1. <u>Subject-No</u> :	Text (20)	
------------------------	-----------	--

- Description : Subject number, each subject is given a unique number having the same format as the DDC to create a tree of subject that expands as further as possible.
- Format : “999.9999999999999999”

2. Description : Text (50)

- Description : subject text.

33. Worked-on

Primary Key : (Collection, Size, Type, Language, Format, DDC, Cutter, workerID)

Collection, Size, Type, Language, Format, DDC, and Cutter link this table to Books table.

WorkerID Links this table to Workers table.

Indexes : Primary Key, Collection, WorkerID, Call-No(Collection, Size, Type, Language, Format, DDC, Cutter)

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>Collection</u> :	Text (5)	“ ”
2. <u>Size</u> :	True/False	False
3. <u>Type</u> :	True/False	False
4. <u>Language</u> :	Text (1)	“E”
- Validation rule : ([Language] in (“E”, “G”, “F”, “A”)).		
5. <u>Format</u> :	Text (5)	“ ”
6. <u>DDC</u> :	Text (20)	
7. <u>Cutter</u> :	Text (6)	“”
8. <u>WorkerID</u> :	Number (Long)	

- Description : the ID of worker

9. Job-code : Text (5)

- Description : a code that describes the kind of job the worker performed on this book.

The description of codes is found in the Codes table.

34. Workers

Primary Key : (Ser-No)

Indexes : Primary Key, First-Name, Last-Name.

<u>Field Name</u>	<u>Type(Size)</u>	<u>Default value</u>
1. <u>Ser-No</u> :	Number (Long)	

- Description : identification number automatically generated by the system for new added workers

2. First-Name : Text (25)

- Description : First name of the worker, it can be empty in case the worker is an institution

3. Last-Name : Text (25)

- Description : Last name of the worker, it can be the name of an institution.

4. Middle-Name : Text (3)

- Description : the middle name of the worker, it can be empty

5. Birth : Year (8)

- Description : the year the worker was born or established.

3.2 Entity Relationship Diagram

The system is composed of two major modules : the circulation module, and the card catalogues search module , the ERD of the two modules is drawn below.

ERD

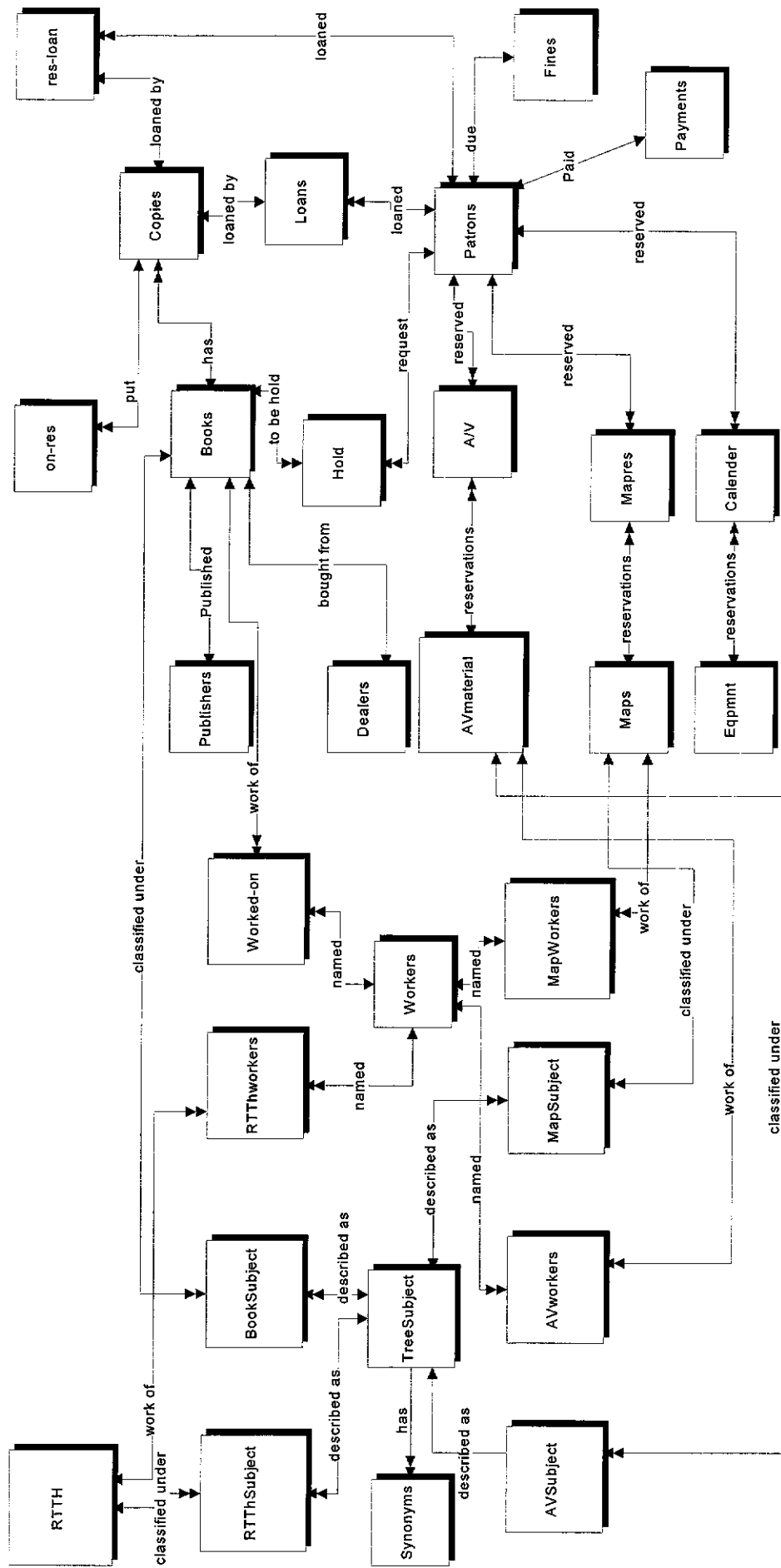


Figure 2.1

3.3 Hierarchical Charts

Hierarchical Charts

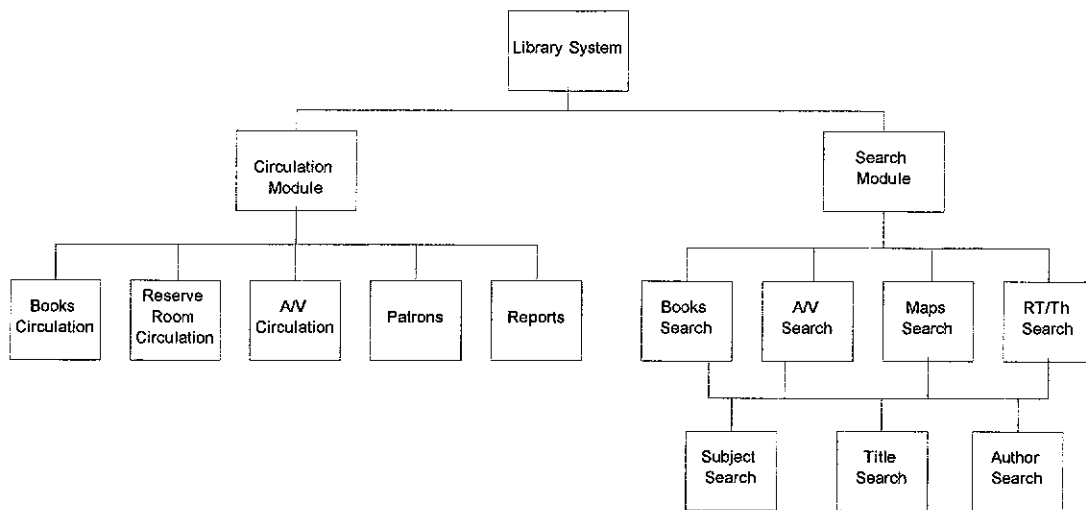


Figure 2.2

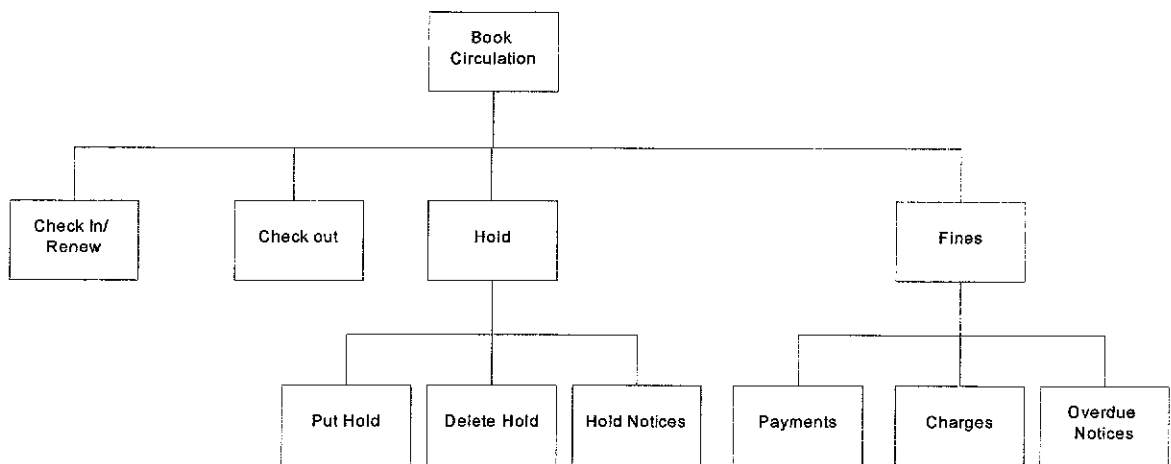


Figure 2.3

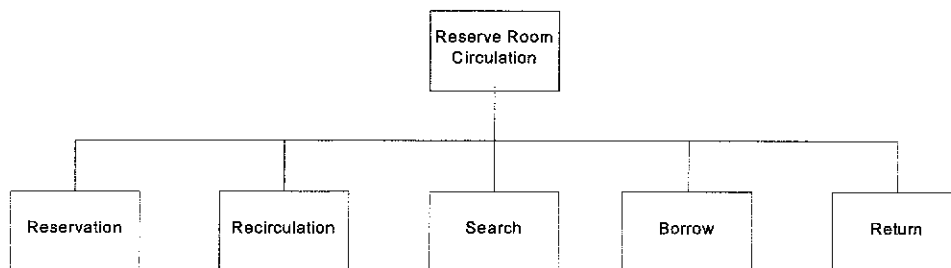


Figure 2.4

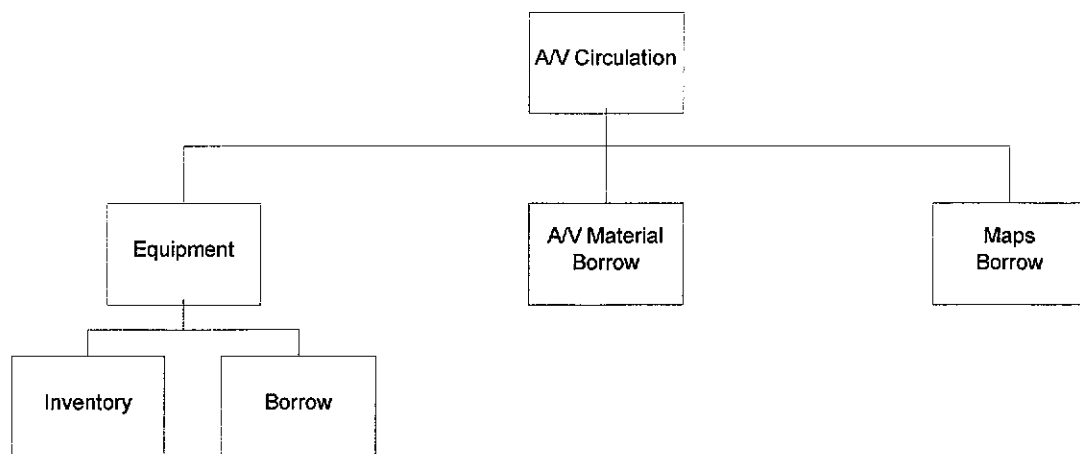


Figure 2.5

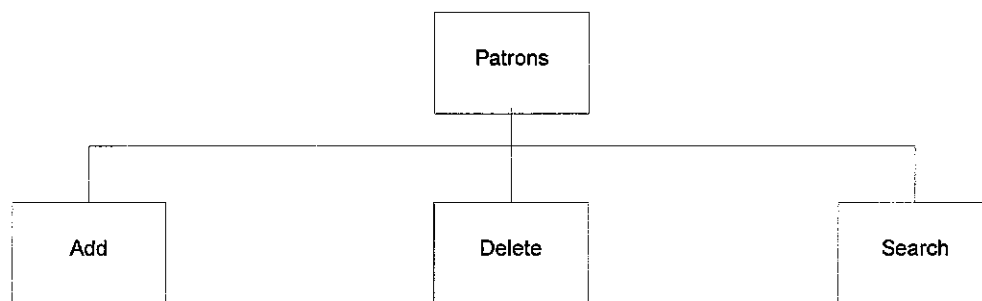


Figure 2.6

3.4 Structured English description of modules

Networking dictates certain precaution procedures to ensure consistency in the database.

First, records are locked while being edited. This is called pessimistic locking in MS ACCESS. This is set by the forms properties called RecordLocks = Edited records and LockEdits = 1 (by default pessimistic).

Second, read-write and write transactions are treated as atomic processes. In case of failures to lock or to update any record in the transaction, a recovery procedure is initiated to undo all. This is accomplished by the MS ACCESS statement

BeginTrans...CommitTans, and the RollBack statement. This is needed when writing ACCESS Basic code.

The different modules in the DFD will be explained in structured English.

Circulation Module

• Book Circulation

A- Check a book out (one or more books)

Get ID/name of patron

Check in PATRON table if (patron record exists, patron status \diamond not blocked, Patron is registered and number of loans by patron found $<$ max. allowances)

If valid

 enter call-no

 if found

 Display title and leading author from BOOKS table

 else if fullIDB = false (Library database is still incomplete)

 get title and leading author and add records to BOOKS, COPIES,
 WORKED-ON, and WORKERS

 else

 reject

 end if

end if

check if book is in (I) in the COPIES table

if in or book is on hold (H) and patron is the one on hold

 flag the book in Copies as out (O)

 enter a record in Loans file

 if book was on hold

 delete record from HOLD table

 adjust waiting queue serials

 end if

else if (out (O)) or (on hold(H) and not the same patron)

 give the patron the choice of being queued for hold

 if yes then

```
        hold it by inserting a record into Hold file (giving priority to faculty)
    end if
end if
end if
end if
```

B-Check book in (one or more books)

Two options : by ID/name or by call number

Check the LOANS table and get record(s, in case of by ID)

Verify the due dates

The book can be returned, renewed, or reported as missing, or reported as DeadLoans

Calculate any overdues (penalty per book/day is taken from MISC table) or charges in case of missing (1 1/2 book price or 150000 L.L.); faculties are not charged.

if yes (overdue or missing or DeadLoan)

flag the patron as Blocked

add new charges to patrons record in FINES table

end if

if book is recalled (C)

Change status in COPIES to (R) and tell the assistant to put it on reserve shelf

else

Check if any request for hold in HOLD table

if yes

change status in Copies table to hold (H)

update the HOLDDATE in HOLD table for the first patron in the waiting queue

else if option is renew and no patron is not blocked

update duedate

else

Change status for book in COPIES table as In (I)

Archive Loan in HISTLOANS table

end if

end if

end if

C- Hold

3 choices are present :

- 1- a patron is requesting a hold
- 2- a librarian wants to delete a hold
- 3- a librarian wants to issue a notice to a holder

1- Request a hold

Get call-no of the book

Display title and leading author from BOOKS table

if no copy is available (all out (O) or on hold (H))

 Get ID#, display name

 if valid then

 insert record into the waiting queue in HOLD table

 end if

end if

2- Delete hold

2 options :

a- Specific delete

get Call Number , Display title and leading author

get ID# , Display full name

verify

delete record

adjust serials in waiting queue accordingly

b- Unresponded notices (Book is on hold for 3 days and not claimed)

Get date

List unresponded holds

verify

delete unresponded holds

adjust serials and give turn to next in queue by putting date in HOLDDATE if last in queue Change status in COPIES table to in (I)

3- Issue notice

Get date

A notice is issued to all holders with HOLDDATE = entered date

D-Fines (one or more dues)

3 Options :

a- Payments

Get ID#, display name

Display due fines from FINES table

Get the paid amount

Adjust due fines in FINES table

Add record in PAYMENTS table

if the whole amount was paid and no dead loans

release the block from PATRON table

end if

The librarian has the right to override the paid amount; i.e. the patron has valid reasons not to be charged the specified amount, no record is added to PAYMENTS table and overridden amount is subtracted from due fines.

b- Charges

1- get ID

2- get charge

3- add charge to FINES table and block patron

c- Issue notice for overdues

Fetch the records of overdues from LOANS file

Get the information from PATRON table (name)

Issue a notice (1st, 2nd, or 3rd) to each overdue and send a copy to Guidance office in case it is 3rd notice

N.B. : the notice number is taken from a LOANS table notice field.

• Reserve Room Circulation

a-Reservation

Get call-no

if book not found

 if FULLDB = false

 get title and leading author

 add records to BOOKS, COPIES, WORKED-ON, and WORKERS

 else reject

 end if

end if

Get course number, and professor

check if not duplicate reservation if yes reject

if out (O)

 recall book by :

 - fetch patron record

 - change COPIES status to recalled (C)

 - send a notice to patron and update the due dates as due in 48 hours

else in (I)

 flag COPIES status as reserved (R)

 add a record to ON-RES table after getting course-no, and professor

end if.

b-Recirculation

Get call-no/course/professor

Fetch record(s)

Update status in Copies as (I) if no more reservations

c-Borrow a reserved book (for inner library usage)

3 options : call-no/course-no/professor

choose a book in second and third option

Verify if books are on shelf (by checking in RES-LOAN table)
if yes display patron ID
else
 if no record for patron, create a temporary record
 grant loan by adding a new record into RES-LOAN table
end if.

d-Return a book on reserve

Get ID/call-no
Delete record in res-loan
if patron is temporary delete record if no more loans.

e-Search of reserved books

Get semester/course-no/professor name or any combination
2- list books on-reserve from ON-RES and BOOKS.

• Equipments

a- Inventory

Get the information (serial and name)
Add record to EQPMNT table and status = ON.
N.B. : This record can be updated and deleted.

b-Reserve Equipment

Get equipment name for an operative equipment (status = ON)
Get dates (from and to)
Get faculty/staff ID
Check if no conflict with other reservations
 Add new record into CALENDER table
end if.

N.B. : an option is available to delete reservation.

- Audio-Visual Circulation(reservation)

Get call number, and display title

if not found and not FULLDB

 get information and add record to AVMATERIAL table

end if.

Get dates (from and to)

Get faculty/staff ID

Check if no conflict with other reservations

 Add new record into A/V table

end if.

N.B. : an option is available to delete reservation.

- Maps reservation

Get call number, and display title From MAPS table

if not found and not FULLDB

 get information and add record to MAPS table

end if.

Get dates (from and to)

Get faculty/staff ID

Check if no conflict with other reservations

 Add new record into MAPRES table

end if.

N.B. : an option is available to delete reservation.

- Patron module

- Add, delete, update , or search records.

- Archive (put all unregistered patrons in a different table, ARCHPATRON)

- Rearchive (re-add unregistered patrons to PATRONS table from ARCHPATRON).

- Reports

- a list of report types is given

- the user choose one

- the report is issued accordingly

- Miscellaneous

2 options:

a- Codes

- the different categories of patrons are identified corresponding maximum number of allowed books and duration (number of weeks)

- type of books in call-no is identified

- any code can be defined.

b- Settings

- semester name, starting, and ending dates

- penalty for overdue (per book/ per day)

- is database is full?

Search Module

- Books/ AV/ Maps/ RT/Th Search

A- Subject Search

Get letters of subject / synonym

Move in the list of subjects/ list of synonyms with the entered letters

Subject is selected

List matching items from (BOOKS/ AVMATERIAL/ MAPS/ RTTH AND WORKERS).

B- Title Search

Get the title

search in BOOKS/ AVMATERIAL/ MAPS/ RTTH

Display record (call number, title and author (workers))

C- Author Search

Choose author from list or enter letters

List matching items from (BOOKS/ AVMATERIAL/ MAPS/ RTTH AND WORKERS).

Access Groups and Permissions

The system users were divided into 4 groups of users :

- Experts
- Librarians
- Assistants
- and, - users

with different authorities over the system.

Experts : they are the programmers, they have access to everything.

Librarians : they are super users, they have access to all running system facilities but not code.

Assistants : they assist librarians, they have access to all running facilities except reports, codes, settings and overriding charges.

Users : they are ordinary patrons, they have access only to search module.

Chapter 4

Implementation

The system was implemented with the MS ACCESS 2.0 Arabic edition. It was developed on a Novell networked PC.

4.1 Listing of Forms, Queries, Macros, Reports, Module, Menus and Relationships among them

This section includes a description of forms with interrelationship among them, and links with macros, queries and reports. Along with this list, lists of queries, macros, and reports will be given with a brief definition of each.

A- Forms

It should be noted that record source does not necessarily mean that this is the main record source or the only source, for in codes other tables and queries may be used.

1. AllAV : This is a reporting form listing all A/V materials.

-Record Source : AVMaterial (table)

-Record Locks : No Locks

-Parent form : Reports

- Reports : AllAV.

2. AllBooks : This is reporting form listing all books.

-Record Source : AllBooks (query)

-Record Locks : No Locks

-Parent form : Reports

-Reports : AllBooks.

3. AllMaps : List all the maps.

-Record Source : Maps (table)

-Record Locks : No locks

-Parent form : Reports

-Reports : AllMaps.

4. AllRecirculate : Recirculate all books on reserve for the current semester.

-Record Source : ReserveData (query)

-Record Locks : edited records

-Parent form : Recirculate.

5. AllRTTh : List all RT/Th.

-Record Source : RTTh (table)

-Record Locks : No Locks

-Parent form : Reports

-Reports : AllRTTh.

6. Archive : archive unregistered patrons in ARCHPATRON table.

-Record Locks : Edited records

-Called by : mainmenu.

7. Author : a subform that displays the author of a book, linked to main form by call number.

-Record Source : on-line query.

-Record Locks : No Locks

-Main Forms : CheckOut, HoldRequest, ResbyCall, Reservation, SubListofLoans, SubRecBook, SubRetResbyCall.

8. AVforAuthor : lists the A/V materials worked on by the selected author.

-Record Source : on-line query.

-Record Locks : No Locks

-Parent Form : CatAvAuthor.

9. AVMain : Audio visual main form, where equipments, materials, or maps forms can be selected for reservation.

-Called by : MainMenu

-Child forms : InvEqpmnt, EqRes, MapRes, AVRes.

10. AVRes : reserve audio visual materials.

-Record Source : on-line query.

-Record Locks : Edited records

-Parent Form : AVMain

-Embedded Form : NewMaterial.

11. AVunderSubject : List AV materials under selected subject.

-Record Source : on-line query.

-Record Locks : No Locks

-Parent Form : CatAVSubject.

12. BookCirculation : main form for book circulation.

- Record Locks : No Locks -Called by : MainMenu.
13. BooksbyCollection : list books in a collection (like Women collection).
 -Record Locks : No Locks -Parent form : Reports
 -Subforms : SubBooksbyCollection -Reports : BooksbyCollection.
14. BooksforAuthor : list books worked on by selected author.
 -Record Source : on-line query.
 -Record Locks : No Locks -Parent form : CatAuthor.
15. BooksunderSubject : list matching books under selected subject.
 -Record Source : on-line query.
 -Record Locks : No Locks -Parent form : CatSubject.
16. BorrowRes : main form to borrow books from reserve room, by call number, course, or professor.
 -Record Locks : No Locks -Parent form : ReserveShelf
 -Child forms : resByCall, ResbyCourse, ResbyProfessor.
17. CatAuthor : search books card catalogues by author.
 -Record Locks : No Locks -Parent form : CatBooks
 -Child form : BooksbyAuthor.
18. CatAV : main form for search in AV card catalogues.
 -Record Locks : No Locks -Parent form : MainLibrary
 -Child forms : CatAVAuthor, CatAVSubject, CatAVTitle.
19. CatAVAuthor : search AV card catalogues by selecting an author.
 -Record Locks : No Locks -Parent form : CatAV
 -Child form : AVforAuthor
20. CatAVSubject : search AV card catalogues by selecting a subject.

- Record Locks : No Locks
-Child form : AVunderSubject.
21. CatAVTitle : search for AV materials by title.
-Record Locks : No Locks
-Subform : SubAVCatTitle.
22. CatBooks : main form to search books card catalogues by subject, author, or title.
-Record Locks : No Locks
-Child forms : CatAuthor, CatTitle, CatSubject.
23. CatMapAuthor : search maps card catalogues by selecting an author.
-Record Locks : No Locks
-Child form : MapsforAuthor.
24. CatMaps : main form to search in maps card catalogues by subject, title, or author.
-Record Locks : No Locks
-Child forms : CatMapAuthor, CatMapSubject, CatMapTitle.
25. CatMapSubject : search in maps card catalogue by selecting a subject.
-Record Locks : No Locks
-Child form : MapsunderSubject.
26. CatMapTitle : search in maps card catalogues by title.
-Record Locks : No Locks
-Subform : SubMapCatTitle.
27. CatRTTh : main form to search RT/Th card catalogues by subject, title, or author.
-Record Locks : No Locks
-Child forms : CatRTThAuthor, CatRTThSubject, CatRTThTitle.
28. CatRTThAuthor : search in RT/Th card catalogues by selecting an author.

- Record Locks : No Locks
-Child form : RTThforAuthor.
29. CatRTThSubject : search in RT/Th card catalogues by selecting a subject.
-Record Locks : No Locks
-Child form : RTThunderSubject.
30. CatRTThTitle : search RT/Th card catalogues by title.
-Record Locks : No Locks
-Subform : SubRTThCatTitle.
31. CatSubject : search in books card catalogues by selecting a subject.
-Record Locks : No Locks
-Child form : BooksunderSubject.
32. CatTitle : search in books card catalogues by title.
-Record Locks : No Locks
-Subform : SubCatTitle.
33. Charges : charge a patron an amount of money.
-Record Locks : Edited Records
-Parent Form : Fines.
34. CheckByCallNo : check in a book by call number.
-Record Locks : Edited Records
-Subform : SubListCallNo.
35. CheckByID : check in books by ID#.
- Record Source : on-line query.
-Record Locks : Edited Records
-Subform : SublistofLoans.
36. CheckIn : this the main form for checking a book in by call number or ID#.

- Record Locks : No Locks
- Parent form : BookCirculation
- Child forms : CheckbyCallNo, and CheckbyID
- Macros : OpenCheckID.

37. CheckOut : Check a book out by a patron. It is required to enter either the patron's ID# or Name.

- Record Source : inquiry (query)
- Record Locks : Edited Records
- Parent form : BookCirculation
- Subforms : Author, and Title
- Child forms : NewBook, and PatronName
- Queries : CountLoans, InQuery, OverDues, PatronCtgry
- Macros : NameSearch .

38. Codes : form to enter the system codes.

- Record Source : Codes (table)
- Record Locks : Edited records
- Called by : MainMenu.

39. CopyRes : returns the status of a copy of a copy. It is linked to its parent form by call number.

- Record Source : Copies (table)
- Record Locks : No Locks
- Parent form : ResByCall.

40. DelHoldDate : deletes holds done in a specified day.

- Record Locks : No Locks
- Parent Form : HoldDelete
- Child form : DelSpecificList
- Macro : ListSpecificDel.

41. DelSpecificHold : delete a specific request for hold on a book.

- Record Locks : Edited Records
- Parent form : HoldDelete
- Subform : SubDelSpecificHold
- Macros : OpenSubDelNames, ReqSubDel.

42. DelSpecificList : delete unresponded holds for specific date.

- Record Source : on-line query.

-Record Locks : Edited Records

-Parent form : DeleteHoldDate.

43. EqRes : reserve equipment for usage in lectures and classes.

-Record Source : on-line query.

-Record Locks : Edited Record

-Parent form : AVMain.

44. Fines : main form for fines to pay, to charge or to issue overdue notices.

-Record Locks : No Locks

-Parent form : BookCirculation

-Child forms : Payments, Charges, OverduList.

45. HoldDelete : a dialog form to choose if user wants to delete a specific hold or all unresponded holds.

-Record Locks : No Locks

-Parent Form : HoldSystem

-Child forms : DeleteHoldDate, DelSpecificHold.

- Macros : OpenSpecificDel, OpenUnres.

46. HoldRequest : request a hold.

-Record Source : on-line query.

-Record Locks : Edited Record

-Parent form : Hold System

-SubForm : Author

- Query : PatronCtgy

-Macros : NewHold, OpenPatronSearch.

47. HoldSystem : main form for holds where user can either request a hold, delete holds or issue notices for fulfilled holds.

-Record Locks : No Locks

-Parent form : Book Circulation

-Child forms : HoldDelete, HoldRequest, IssueNotice

-Macros : OpenHoldDelete, OpenIssue, OpenRequest.

48. InvEqpmnt : Equipments inventory.

-Record Source : Eqpmnt

-Record Locks : Edited Record

-Parent form : AVMain.

49. IssueNotice : issue notices for patrons who have books on hold.

-Record Locks : No Locks
-Parent form : Hold System
-Report : RepIssueHoldNotice.

50. ListDueFines : list due fines for the library due to overdues and charges.

-Record Source : ListDueFines (Query) -Parent form : Reports.

51. ListofBorrowedBooks : list of all borrowed books.

-Record Source : ListBorrowedBooks -Record Locks : No Locks
-Parent form : Reports -Reports : ListofBorrowedBooks

52. LoansForm : list of borrowed books by a patron.

-Record Source : LoanBooks -Record Locks : No Locks
-Parent form : PatronMod, RepBorrowed.

53. LOGO : a “splash screen” for the application.

-Calls : MainLibrary - Menu : LOGOMenu

54. MainForm : main form for circulation.

-Parent form : MainLibrary - Menu : MainMenu
-Child forms : AVMain , BookCirculation, Codes, PatronMod, ReserveShelf, Reports, Settings.

55. MainLibrary : main form for all the library system.

-Called by : LOGO -Menu : MainLibrary
-Child forms : Mainform, CatAV, CatBooks, CatMaps, CatRTTh.

56. MapRes : reserve maps for usage in classes.

-Record Source : on-line query.
-Record Locks : Edited Record -Parent form : AVMain
-Child form : NewMap.

57. MapsforAuthor : list maps for selected author.

-Record Source : on-line query.

-Record Locks : No Locks

-Parent form : CatMapAuthor.

58. MapsunderSubject : list maps under selected subject.

-Record Source : on-line query.

-Record Locks : No Locks

-Parent form : CatMapsAuthor.

59. NewBook : add a new book when a book is not founded while checking a book out, as long as library database is not complete.

-Record Source : Books (table)

-Record Locks : Edited Record

-Parent form : CheckOut

-Macros : BookOpen, SaveTitle, SetCopies, VolSet.

60. NewBookRes : add a new book when a book is not founded while putting a book on reserve, as long as library database is not complete.

-Record Source : Books (table)

-Record Locks : Edited Record

-Parent form : Reservation

-Macros : BookOpenRes, SaveTitleRes, SetCopiesRes, VolSetRes.

61. NewMap : add a new map when a map is not founded while reserving a map, as long as library database is not complete.

-Record Source : Maps (table)

-Record Locks : Edited Record

-Parent form : MapRes

-Macros : NewMap.

62. NewMaterial : add a new AV material when a material is not founded while reserving a material, as long as library database is not complete.

-Record Source : AVMaterial (table)

-Record Locks : Edited Record

-Parent form : AVRes

-Macros : NewMaterial.

63. OverdueList : issue warning messages to overdues.

-Record source : ListNoticesDues (Query)

-Record Locks : No Locks

-Parent form : Fines

-Reports : NoticebyID0, NoticebyID1, NoticebyID2

-Queries : OverduebyID0, OverduebyID1, OverduebyID2.

64. PassPayments : password level to override payments.

-Record Locks : No Locks

-Parent form : Payments.

65. PatronName : choose a patron by name from a list.

-Record Locks : No Locks

-Parent form : CheckOut.

66. PatronMod : keeps track of patrons records : add, delete, and search.

-Record Source : Patrons (table)

- Record Locks : No Locks

-Parent form : MainForm

-Child forms : SearchForm

-Subform : LoansForm

-Macros : IDGenerate, NewRec, SearchMacro, UpdateSerID.

67. PatronSearch : Choose the name of the patron who wants to put a hold on a book by name.

-Record Locks : Edited Record

-Parent form : HoldRequest.

68. Payments : handles payments.

-Record Source : on-line query.

-Record Locks : Edited Record

-Parent form : Fines

-Child form : PassPayments

-Macro : CalculateNet

-Query : DLCount.

69. PopUpID# : list of matching patrons with the name entered in SearchForm.

-Record Source : Patrons

-Record Locks : No Locks

-Parent form : SearchForm

-Macro : SetToID

-Query : Matching.

70. ReArchive : returns patrons records extracted earlier by Archive.

-Record Locks : Edited Record

-Called by : MainMenu.

71. RecBook : recirculate a specific book.

-Record Locks : Edited Record

-Parent form : Recirculate

-Subform : SubRecBook.

72. RecCourse : recirculate books on reserve for a course.

-Record Locks : Edited Record

-Parent form : Recirculate

-Subform : SubRecCourse.

73. Recirculate : main form to recirculation by book, course, professor, or all.

-Record Locks : No Locks

-Parent form : ReserveShelf

-Child forms : AllRecirculate, RecBook, RecCourse, RecProfessor.

74. RecProfessor : recirculate books put on reserve for a professor.

-Record Locks : No Locks

-Parent form : Recirculate

-SubForm : SubRecProfessor.

75. RepAbusing : list all abusing patrons, overdues with 3 warnings.

-Record Source : NameAbusingPatrons (query)

-Record Locks : No Locks

-Parent form : Reports

-Reports : repAbusingPatrons.

76. RepAV : list all reservations for AV materials between 2 dates.

-Record Source : RepAVRes (query)

-Record Locks : No Locks

-Parent form : ResDuration

-Reports : RepAVRes.

77. RepBorrowed : list loans of a patron.

-Record Locks : No Locks

-Parent form : Reports

-SubForm : LoansForm

-Reports : RepBorrowed.

78. RepDLBooks : report books dead loaned or missing.

-Record Source : DLBooks (query)

-Record Locks : No Locks

-Parent form : Reports

-Reports : RepDLBooks.

79. RepEqpmnt : report equipment reservation between 2 dates.

-Record Source : RepEqpmntRes (query)

-Record Locks : No Locks

-Parent form : ResDuration

-Reports : RepEqpmntRes.

80. RepMaps : report maps reservation between 2 dates.

-Record Source : RepMApRes (query)

-Record Locks : No Locks

-Parent form : ResDuration

-Reports : RepMapRes.

81. Reports : list all kinds of reports supported by the system.

-Record Locks : No Locks

-Parent form : MainForm

-Child forms : AllAV, AllBooks, AllMaps, AllRTTh, StatOptions, RepPatrons, BooksbyCollection, ListofBorrowedBooks, RepBorrowed, RepOverdue, RepDLBooks, RepAbusing, Searchres, RepPayments, ListDueFines, ResDuration.

82. RepOverdue : list all overdues.

-Record Source : ListNoticesDues (query)

-Record Locks : No Locks

-Parent form : Reports

-Reports: RepOverdue.

83. RepPatrons : choose category whose patrons are to be listed.

-Record Locks : No Locks

-Parent form : reports

-Child form : SubRepPatrons

-Reports : RepPatrons

-Macro : RepPatrons.

84. RepPayments : receives the dates between which to report payments done.

-Record Locks : No Locks

-Parent form : Reports

-Child form : SubRepPayments

-Reports : RepPayments.

85. ResbyCall : borrowing reserved books by call number.

-Record Source : on-line query.

-Record Locks : Edited Record

-Parent Form : BorrowRes

-Subforms : Author, CopyRes

-Child form : TempPatron.

86. ResbyCourse : borrow a reserved book by course number.

-Record Locks : No Locks

-Parent form : BorrowRes

-SubForm : SubResbyCourse.

87. ResbyProfessor : borrow a reserved book by professor.

-Record Locks : No Locks

-Parent form : BorrowRes

-SubForm : SubResbyCourse.

88. ResCurr : list books on reserve for a selected criteria in SearchRes.

-Record source : on-line query.

-Record Locks : No Locks

-Parent form : SearchRes

-Reports : RepReserved

-Query : ReserveCurData.

89. ResDuration : receive the dates between which to report reservation for equipments, maps, or AV materials.

-Record Locks : No Locks

-Parent form : Reports

-Child forms : RepAV, RepEqpmnt, RepMaps.

90. Reservation : put a book on reserve shelf.

-Record Source : on-line query.

-Record Locks : Edited Record

-Parent form : ReserveShelf

-Child forms : NewBookRes

-Subforms : Author, title

-Reports : RecallNotice.

91. ReserveShelf : main form for reserve shelf functions.

-Record Locks : No Locks

-Parent form : MainForm

-Child forms : Reservation, Recirculate, BorrowRes, Return Reserve, SearchRes.

92. RetResbyCall : return a book by call number to reserve shelf borrowed by a patron.

-Record Locks : Edited Record

-Parent form : Return Reserve

-Subform : SubRetResbyCall

-Macro : ReqSubRetResbyCall.

93. RetResbyID : return books to reserve shelf borrowed by a patron by ID.

-Record Locks : Edited Record

-Parent form : Return Reserve

-Subform : SubRetResbyID.

94. Return Reserve : select which way to return a borrowed book from reserve room : by call number or by ID.

-Record Locks : No Locks

-Parent form : ReserveShelf.

95. RTThforAuthor : list RT/Th for selected author.

-Record Source : on-line query.

-Record Locks : No Locks

-Parent form : CatRTThAuthor.

96. RTThunderSubject : list RT/Th under the selected subject.

-Record Source : on-line query.

-Record Locks : No Locks

-Parent form : CatRTThSubject.

97. SearchForm : a dialog form to search for patrons by name.

-Record Locks : No Locks

-Parent form : PatronMod

-Child form : PopUpID#

-Macros : PopMatchingID, SearchbyID.

98. SearchRes : search for reserved books by a combination of semester, course number and professor.

-Record Locks : No Locks

-Parent form : ReserveShelf

-Child form : ResCurr.

99. Settings : set all system parameters.

-Record Source : Misc

-Record Locks : No Locks

-Parent form : mainForm.

100. Statistics Over Months : gives statistical information on loans per subjects over months.

-Record Locks : No Locks

- Parent form : StatOptions.

101. Statistics Over Weeks : gives statistical information on loans per subjects over weeks.

-Record Locks : No Locks

- Parent form : StatOptions.

102. Statistics Over Years : gives statistical information on loans per subjects over years.

-Record Locks : No Locks

- Parent form : StatOptions.

103. StatOptions : options for statistical reports.

-Record Locks : No Locks

-Parent form : Reports.

104. SubAVCatTitle : displays AV material matching entered title in card catalogue search.

- Record Source : AVMaterial (table)

-Record Locks : No Locks

-Parent form : CatAVTitle.

105. SubBooksbyCollection : lists books in a collection.

-Record Source : BooksbyCollection

-Record Locks : No Locks

-Parent form : BooksbyCollection.

106. subCatTitle : displays books matching entered title in card catalogues search.

-Record Source : BooksbyTitle

-Record Locks : No Locks

-Parent form : CatTitle.

107. SubDelNames : List patrons whose last name matches entered last name in DelSpecificHold.

-Record Locks : No Locks

-Parent form : DelSpecificHold.

108. SubDelSpecificHold : display books title and author for entered call number.

-Record Source : on-line query.

-Record Locks : No Locks

-Parent form : DelSpecificHold.

109. Subject Over Months : displays statistical information about loans for a subject over months.

-Record Locks : No Locks

-Parent form : StatOptions.

110. Subject Over Weeks : displays statistical information about loans for a subject over weeks.

-Record Locks : No Locks

-Parent form : StatOptions.

111. Subject Over Years : displays statistical information about loans for a subject over years.

-Record Locks : No Locks

-Parent form : StatOptions.

112. SubListCallNo : display the loans record for entered call number.

- Record Source : on-line query.

-Record Locks : Edited record

-Parent form : CheckbyCallNo

-Subform : Author.

113. SubListofLoans : list all loans for selected ID#.

-Record Source : ListofLoans (query)

-Record Locks : No Locks

-Parent form : CheckbyID

-Subform : Author.

114. SubMapCatTitle : list all maps matching entered title in search.

-Record Source : Maps

-Record Locks : No Locks

-Parent form : CatMapsTitle.

115. SubRecBook : displays title and author for entered call number.

-Record Source : on-line query.

-Record Locks : No Locks

-Parent form : RecBook

-Subform : Author.

116. SubRecCourse : list of books on reserve for current course.

-Record Source : on-line query.

-Record Locks : No Locks

-Parent form : RecCourse.

117. SubRecProfessor : list of books on reserve for current professor.

-Record Source : ReserveData

-Record Locks : No Locks

-Parent form : RecProfessor.

118. SubrepPatrons : list of patrons in a class.

-Record Source : on-line query.

-Record Locks : No Locks

-Parent form : RepPatrons.

119. SubRepPayments : report all paid amounts in a period.

-Record Source : on-line query.

-record Locks : No Locks

-Parent form : RepPayments

-Query : SumPayments.

120. SubResbyCourse : list of books on reserve for current course/professor.

-Record Source : ReserveData

-Record Locks : No Locks

-Parent form : ResbyCourse, ResbyProfessor.

121. SubRetResbyCall : displays loans information about a borrowed book from reserve.

-Record Source : on-line query.

-Record Locks : No Locks

-Parent form : RetResbyCall

-Subform : Author.

122. SubRetResbyID : displays list of loans information about a borrowed books from reserve.

-Record Source : ListRetResbyID (query)

-Record Locks : No Locks

-Parent form : RetResbyID.

123. SubRTThCatTitle : list RT/Ths matching the title entered.

-Record Source : on-line query.

-Record Locks : No Locks

-Parent form : RTThCatTitle.

124. TempPatron : Add a temporary patron for reserve shelf borrowings.

-Record Source : patrons (table)

-Record Locks : No Locks

-Parent form : ResbyCall

-Macros : EndNewTemp, NewTempPatron.

125. Title : gives the title of a book.

-Record Source : Books (table)

- Record Locks : No Locks

-Parent form : CheckOut, Reservation.

B- Queries

The queries have been implemented using the QBE tool offered by MS ACCESS.

1. AllBooks : list of all books with their leading author, or editor, ...

- Used in : AllBooks (form) and AllBooks (report).

2. BooksByCollection : list of books in a collection.

- Used in : SubBooksbyCollection (form) and BooksinCollection (report).

3. BooksbyTitle : books matching a title.

-Used in : SubCatTitle (form).

4. BooksUnderSubject : list of books under a specific subject.

- Used in : BooksunderSubject (form).

5. CountLoans : counts the number of loans for a patron.

- Used in : CheckOut (form)

6. DLBooks : list of books lost or dead loan.

- Used in : RepDLBooks (form), and RepDLBooks (report).

7. DLCount : counts the number of dead loaned books for a patron.

- Used in : Payments (form).

8. IDAbusingPatron : list of patrons with overdue books and received 3 warnings.

- Used in : NameAbusingPatron (Query).

9. InQuery : query on which the Checkout form is based, it links Codes, Patrons, Loans, and Copies tables.
10. IssueHoldNotice : issue hold notice for a patron.
 - Used in : RepIssueHoldNotice (report)
11. ListBorrowedBooks : list of borrowed books by a patron.
 - Used in : ListofBorroedBooks (form), and ListofBorrowedBooks (report).
12. ListDueFines : list of due fines from calculated overdues and charges.
 - Used in : ListDueFines (form) and ListDueFines (report).
13. ListNoticesDues : list of patrons with overdue books.
 - Used in : OverdueList, RepOverdue (forms), and repOverdue (report).
14. ListofLoans : list of all loans.
 - Used in : SubListofLoans (form).
15. ListofPatrons : list of registered patrons in a class.
 - Used in : RepPatrons (report).
16. ListRetResbyID : list of books on reserve shelf borrowed by a patron.
 - Used in : SubRetResbyID (form).
17. LoanBooks : list of borrowed books arranged by title.
 - Used in : LoansForm (form), and RepBorrowed (report).
18. Matching : list of patrons with name matching entered parts of name.
 - Used in : PopUpID# (form).
19. NameAbusingPatrons : list of patrons aith overdue books and received 3 warnings.
 - Used in : repAbusing (form), and RepAbusingPatrons (report).
20. OverdueByID0 : patrons with overdues who hasve received 0 warning notice.
 - Used in : OverdueList (form), and NoticebyID0 (report).
21. OverdueByID1 : patrons with overdues who hasve received 1 warning notice.
 - Used in : OverdueList (form), and NoticebyID1 (report).
22. OverduebyID2 : patrons with overdues who hasve received 2 warning notice.
 - Used in : NoticebyID2 (report), and OverdueList (form).
23. Overdues : overdue books on a patron not in faculty or staff.
 - Used in : CheckOut (form).
24. PatronCtgry : category of a patron requesting a hold.
 - Used in : Checkout, and HoldRequest (forms).

25. RecallData : data to issue a recall notice for a patron who has a book to be put on reserve.

- Used in : RecallData (report).

26. RepAVRes : reservations for AV materials.

- Used in : RepEqpmnt (form), and RepEqpmntRes (report).

28. RepMapRes : maps reservations.

- Used in : repMaps (form), RepMapRes (report).

29. ReserveCurData : data for books on reserve satisfying a criteria.

- Used in : ResCurr (form) and RepReserved (report).

30. ReserveData : data on reserved books.

- Used in : subRecProfessor, SubRecCourse, and SubRebyCourse (forms).

31. SumPayments : sum of received payments.

-Used in : SubRepPayments (form).

C- Macros

1. Autoexec : executes automatically on database opening.

OpenForm(LOGO,Form,,,Edit,Normal) for an interval of time, HourGlass(YES), Maximize.

2. BookOpen : creates a new record in Books table using NewBook form, and sets call number equal to one entered in CheckOut form.

3. BookOpenRes : creates a new record in Books table using NewBookRes form, and sets call number equal to one entered in Reservation form.

4. CalculateNet : calculates net amount in Payments form.

5. EndNewTemp : closes TemPatron form.

6. ExitApp : closes the active window and the database, called by LibraryMenu.

7. ExitApplication : closes active windows, available in MainMenu menu.

8. IDGenerate : generates an ID# for non students patrons.

9. LibraryMenu : adds LibraryMenu.

10. LibraryMenu-Library : executes Library option in LibraryMenu.

11. LibraryMenu-Library-CardCatalogues : executes card catalogues option in LibraryMenu.

12. ListSpecificDel : OpenForm(DelSpecificList,Form,,,Edit,Normal) used in DelHoldDate form.
13. LogoMenu : adds menu for LOGO form.
14. LogoMenu-Library : executes quit option in LogoMenu.
15. MainCirculation : used in MainMenu menu, it open MainForm form for authorized personnel (Experts, Librarians, and assistants).
16. MainMenu : creates MainMenu for MainForm.
17. MainMenu-Circulation : executes appropriate macros for the different options in Circulation and Patrons options for MainMenu menu.
18. MainMenu-Circulation-Patrons : executes appropriate macros for the different options in Miscellaneous option for MainMenu menu.
19. NameSearch : OpenForm(PatronName,Form,,,Edit,Normal) used in CheckOut form.
20. NewHold : goes to a new record in HoldRequest form.
21. NewMap : creates a new record for a new map in NewMap form and setting the call number to the one entered in MapRes form.
22. NewMaterial : creates a new record for a new AV material in NewMaterial form and setting the call number to the one entered in AVRes form.
23. NewRec : goes to a new record in PatronMod form, i.e., a new patron record.
24. NewTempPatron : creates a new record for a temporary patron in TempPatron form using ResByCall form ID#.
25. OpenArchive : OpenForm(Archive,Form,,,Edit,Dialog), called by MainMenu menu, only authorized personnel (experts, Librarian).
26. OpenAVMain : OpenForm(AVMain,Form,,,Read Only,Normal), called by MainMenu menu.
27. OpenBookCirculation : OpenForm(BookCirculation,Form,,,Read Only,Normal), called by MainMenu menu.
28. OpenCheckID : OpenForm(CheckbyID,Form,,,Edit,Normal)and Close CheckIn form called by MainMenu menu.
29. OpenCodes : OpenForm(Codes,Form,,,Edit,Dialog) called by MainMenu menu, only for authorized personnel (experts, Librarian).
30. OpenHoldDelete : OpenForm(HoldDelete,Form,,,Edit,Dialog) called by HoldSystem form.

31. OpenIssue : OpenForm(IssueNotice,Form,,,Edit,Dialog) called by HoldSystem form.
32. OpenPatron : OpenForm(PatronMod,Form,,,Edit,Normal) called by MainMenu menu.
33. OpenPatronSearch : OpenForm(PatronSearch,Form,,,Edit,Dialog) called by HoldRequest form.
34. OpenRearchive : OpenForm(Rearchive,Form,,,Edit,Dialog) called by MainMenu menu.
35. OpenReports : OpenForm(IssueNotice,Form,,,Edit,Normal) called by MainMenu menu.
36. OpenRequest : OpenForm(HoldRequest,Form,,,Add,Dialog) called by HoldSystem form.
37. OpenReserveShelf : OpenForm(ReserveShelf,Form,,,Read Only,Normal) called by MainMenu menu.
38. OpenSettings : OpenForm(Settings,Form,,,Edit,Dialog) called by MainMenu menu, by authorized personnel (experts, Librarian).
39. OpenSpecificDel : OpenForm(DelHoldDate,Form,,,Edit,Dialog) called by HoldDelete form.
40. OpenSubDelNames : OpenForm(SubDelNames,Form,,,Edit,Dialog) called by DelSpecificHold form.
41. OpenUnres : OpenForm(DelSpecificHold,Form,,,Edit,Dialog) called by HoldDelete form.
42. PopMatchingID : OpenForm(PopUpID#,Form,,,Edit,Normal) called by SearchForm form.
43. RepPatrons : OpenForm(SubRepPatrons,Form,,,Read Only,Dialog) and close RepPatrons form.
44. ReqSubDel : requery SubDelSpecificHold, called by DelSpecificHold form.
45. ReqSubretResbyCall : requery SubretResbyCall, called by RetResbyCall form.
46. SaveTitle : save title in a temporary control box, in NewBook form.
47. SaveTitleRes : save title in a temporary control box, in NewBookRes form.
48. SearchAV : OpenForm(CatAV,Form,,,Edit,Normal) called by LibraryMenu menu.
49. SearchBooks : OpenForm(CatBooks,Form,,,Edit,Normal) called by LibraryMenu menu.

50. SearchByID : return ID# found by searching by name in SearchForm, and find it in PatronMod form and return control to PatronMod.
51. SearchMacro : OpenForm(SearchForm,Form,,,Edit,Normal) called by PatronMod form.
52. SearchMaps : OpenForm(CatMaps,Form,,,Edit,Normal) called by LibraryMenu menu.
53. SearchRTTh : OpenForm(CatRTTh,Form,,,Edit,Normal) called by LibraryMenu menu.
54. SetCopies : set the copies field in Books table to true in case of more than 1 copy in NewBook form.
55. SetCopiesRes : set the copies field in Books table to true in case of more than 1 copy in NewBookRes form.
56. SetToID : returns control to PatronMod form after finding the corresponding ID# for the name entered in SearchForm and sent to PopUpID# form, and goes to the record in PatronMod form.
57. UpdateSerID : increase serial ID# kept in Misc table, called by PatronMod form.
58. VolSet : set the vol-no field in Books table to number entered in NewBook form.
59. VolSetRes : set the vol-no field in Books table to number entered in NewBookRes form.

D- Reports

Reports will be listed in alphabetical orders, and a sample of each report can be found in the Appendix B.

Report Name	Issued from (forms)	Uses query
AllAV	AllAV	<i>on line query</i>
AllBooks	AllBooks	AllBooks
AllMaps	AllMaps	<i>on line query</i>
AllRTTH	AllRTTh	<i>on line query</i>
BooksInCollection	BooksbyCollection	BooksbyCollection
ListDueFines	ListDueFines	ListdueFines
ListofBorrowedBooks	ListofBorrowedBooks	ListBorrowedBooks
NoticebyID0	OverdueList	OverdueID0
NoticebyID1	OverDueList	OverdueID1
NoticebyID2	OvedueList	OverdueID2
RecallNotice	Reservation	RecallData
RepAbusingPatrons	RepAbusing	NameAbusingPatrons
RepAVRes	RepAV	RepAVRes
RepBorrowed	RepBorrowed	LoanBooks
RepDLBooks	RepDLBooks	DLBooks
RepEqmmtRes	RepEqmmt	RepEqmmtRes
RepIssueHoldNotice	IssueNotice	IssueHoldNotice
RepMapRes	RepMaps	RepMapRes
RepOverdue	RepOverdue	ListNoticesDues
RepPatrons	subRepPatrons	ListofPatrons
RepPayments	SubRepPayments	<i>online query</i>
RepReserved	ReserveCurr	ReserveCurData

E- Module

Only 2 functions are used in the system and present in MiscMod module :

- CheckDelete : checks if a patron record can be deleted, i.e., patron does not have any books, books on reserve shelf (in case of faculty), or due fines to pay. It is called from PatronMod (form).
- GetNextID : generates an ID for non LAU students, and for temporary patrons. It is called by TemPatron (form) and PatronMod (form).

F- Menus

The system uses 3 menus :

- LOGOMenu : the menu displayed when the database is opened.
- LibraryMenu : the main menu for the system (circulation and card catalogues search)
- MainMenu : the main menu for circulation module.

4.2 Development Effort

As mentioned previously, the system has been implemented using the MS ACCESS 2.0 Arabic Edition. MS ACCESS is an object oriented relational database, with event-driven programming style.

- Networking : The System is developed to work on an network. This was done by :

1. setting the options in the MS ACCESS Multiuser/ODBC to :

Number of Update Retries = 5

Update Retry Interval = 250 milliseconds.

This gives 1,25 second wait before you receive the Can't Update message box when another user is updating the same records.

2. setting the RecordLocks = Edited records and LockEdits = 1 (pessimistic) properties in forms where records are updated.

3. dividing update transactions into atomic processes such that the whole transaction is executed or none. This is done with the help of Basic ACCESS statement :

CurrentWorkspace.BeginTrans

On Error GoTo UndoTrans

{ statements for update }

CurrentWorkspace.CommitTrans

On Error GoTo Somewhere

...

Exit Sub

UndoTrans :

On Error GoTo UndoError

CurrentWorkspace.Rollback

Exit Sub

UndoError :

{message}

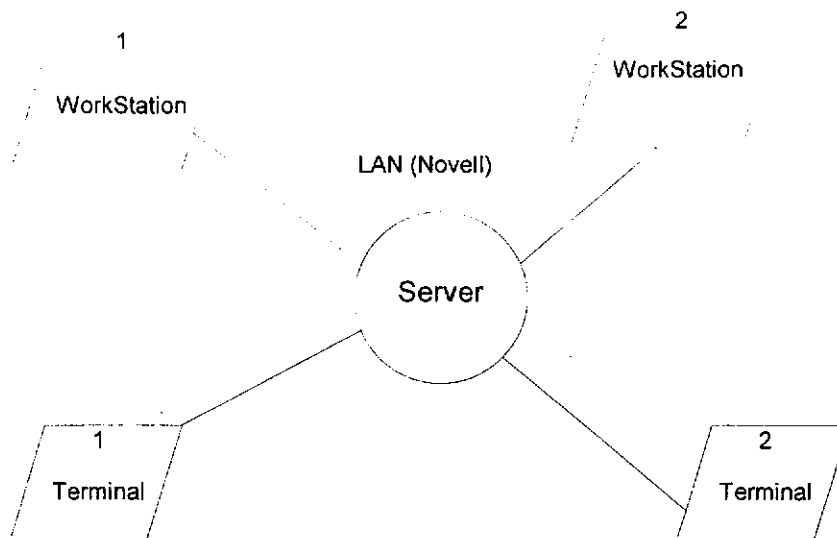
Exit Sub.

- Help System : A help system was developed to assist users in working on the application. The procedure to create a help file is as follows :
 - Create a help document where WinHelp engine instructions are embedded in the form of footnotes. Footnote symbols used are : # to indicate a context string and \$ to indicate a topic title. (Help.Doc Winword 6.0)
 - Save it in *.RTF* format. (Library.RTF)
 - Create a help project file *.HPJ* : this is where the context strings are linked to context IDs. (Library.HPJ)
 - Compile the *.HPJ* with HC compiler to create the *.HLP* file. (Library.HLP).
 - in each form set the Help File = Library.Hlp and Context ID = appropriate number.
- The help file should in the same directory as the database file (.mdb).

4.3 System Requirements

4.3.1 Hardware

The system hardware requirements are actually due to the library requirements. The system is to be installed on a network, so at least two computer systems are needed one as server and another as workstation. The server naturally has to be at least 100 MHZ Pentium with 16 MB ROM and 2GB RAM. In addition, to coordinate with the server the workstation has to have a competent power. Of course, there should also be a Printer to ouput reports. The architecture of the system :



As for Diskspace, the application is approximately 12 MB without any data. Any library item will need 1 KB of diskspace for its data (bibliography, workers, dealers, publishers, and subjects), each patron record 45 bytes, and each loan 64 bytes (any item loan or reservation), these figures are rough figures since exact figures depends on each item.

4.3.2 Software

Some software packages are needed for the system :

- Novell for the network (or any LAN software that can give the same results)
 - Windows for Workgroups 3.11 Arabic Version (or any Windows version that can give the same results)
- and, - Microsoft Access 2.0 Arabic Version.

4.3.3 Conversion

Two sorts of conversion may be needed :

- Conversion from manual work to automated work : any software system needs a testing period. The system has been tested both on personal computers and on network; however, it is advisable, at least during the first semester may be to work in parallel with the manual system. This is a precaution step to ensure no loss of data, since problems may be faced not only in software but also in hardware before arriving to a stable stage. Another reason and which is the real reason is that staff may not be familiar at the first stage with

the application and they may need training to work easily on the application although it has been designed to be as user friendly and clear as possible.

- Conversion from incomplete library system to complete one : the tables for books, AV materials, RTTh, and maps are still empty. During work with the application, few fields of these tables will be filled by the borrowed items. On completeness of the library package, the tables has to be emptied and refilled with complete data. On the other side, the application has to be informed that the library system is complete. This is done by entering into the “settings” option under the “Miscellaneous” in the circulation menu and checking the “is the database full?”.

4.4 Conclusion and Suggestions for Further Work

The application was developed to assist the Stoltzfus Library in its services. Library services range from acquisition to circulation passing through classification and cataloguing. The system will offer the circulation services along with card cataloguing search.

The system, as it is, is only one part of a large package, further work is still needed to offer the other library functions. In addition to completing the library package, the package should exchange data with the other university departments. For example, registered patrons records can be imported from the registrar instead of manual entrance. Second, patrons fines can be exported to the business office for payments. Third, abusing patrons' records can be sent to Guidance Office immediately. Of course, this needs automation all over the university, which is a long term project.

Appendix A

User Manual

System installation

For this application to work, you have to install first MS Access 2.0 Arabic version on your PC, or Server for networks.

Follow the following steps to install the application :

- Make sure you have 5 3.5" disks : 3 backup disks of the application, 1 MSBACKUP version files 6.0 and pkunzip.exe file disk, and 1 disk for help and system.mda files.
- If your msbackup version is higher than 6.0 you will need to do the following:
create a new directory and copy the msbackup files contained in the disk, use the copied msbackup version to restore the files.
- Restore the application using the 3 first disks.
- One file will be restored LIB.ZIP into C:\LIB directory.
- Copy pkunzip.exe and use it to unzip LIB.ZIP file (PKUNZIP LIB). You will get two files : Library.mdb and Library.ldb.
- Copy system.mda and Library.hlp from 5th disk.

Note that you will always need to copy system.mda to the directory where MS Access is installed as C:\ACCESS. If you are running other MS Access application you will need to save old system.mda before moving system.mda of the library application to MS Access directory.

Of course, if you are working on a network you will need to move the application files to the shared directory on the server as d:\users\Library\. You will need to set the following in the MS Access Multiuser/ODBC category of options for the application to run correctly for multiusers.

- Set Default open Mode for databases = shared
- Set Default Record Locking = Edited Record
- Set the Number of Update retries = 5 and Update Retry Interval = 250 msec.

How to run the application ?

You will need to follow the following steps :

- Make sure you have the library application version of system.mda in MS Access directory. Don't forget to save the old version in case you have other MS Access applications.
- Launch MS Access from your windows.
- Type the name of the group you belong to in Account name box. Press Tab, type the password and press enter.
- You will get MS Access menu. From File option, choose open database.
- Choose the correct directory where the Library.mdb file is present and choose Library to run the application.
- In case you need help, just press F1 to get help.

Appendix B

Reports Samples

The following pages are samples of all reports that can be generated by the application. They have been printed using inkjet Epson Stylus 820 printer.

List of all Audio-Visual Material

15-Jan-97

Call Number	Title	copies	Parts	Publication Date	Edition Number
J F 23	E Beauty and the Deast	2	2		
J PS 24	E Canderella	2	2		
J FS 35	E Tom And Jerry	2	2		

List of All Books

15-Jan-97

Collection Title Author Number of Vol. copies Publication Date Ed. Number

<input type="checkbox"/> Folio <input checked="" type="checkbox"/> Reference E	irataia	titit	0	<input checked="" type="checkbox"/>
123.4				
123				

W <input type="checkbox"/> Folio <input checked="" type="checkbox"/> Reference A	femme	dada	0	<input type="checkbox"/>
125.4				
S123s				

<input type="checkbox"/> Folio <input checked="" type="checkbox"/> Reference E	History	hoho	0	<input type="checkbox"/>
456.				
F561f				

List of all Maps

15-Jan-97

Call Number	Title	copies	Publication Date	Edition
E M 222.2 A222a	Lebanon			1
E M 233.33 23	SYria			1
E M 333.3333 22	Egypt			1

List of All reasearches/Thesis

15-Jan-97

Call Number	Title	No. of Vols	copies	Publication Date	Edition
A123a	E Network	0	1	1996	

Books in Collection

15-Jan-97

Call Number	No. of Vol. copies	Title	Publication Date	Ed. No.	Author
<input type="checkbox"/> Folio <input type="checkbox"/> Reference E 456.6 566	0	fafi			qo
W <input type="checkbox"/> Folio <input type="checkbox"/> Reference A 125.4 S123s	0	femme			rew
<input type="checkbox"/> Folio <input type="checkbox"/> Reference E 456. F561f	0	History			dada
W <input checked="" type="checkbox"/> Folio <input type="checkbox"/> Reference A 789.52 L789l	2	Islamic Woman			foufou

List of Due Fines

15-Jan-97

ID Number	First Name	Last Name	Due-fees
3	Watsi	Yung	3000
4	Rania	Murtada	9000
940101	Rola	Karaki	1000
940579	Rania	Murtada	3000
			16000

List of Borrowed Books

15-Jan-97

Call Number	Title	Patron	Check Out Date	Due Date
<input type="checkbox"/> Folio <input type="checkbox"/> Reference E	fafi	895011	06/11/1996	23/11/1996
456.6	foufou	Khadijeh		
566		Murtada		
0 0				

Stoltzfus Library-List of overdues

ID #: 895011

Khadijeh

Murtada

15-Jan-97

<u>Call Number</u>	<u>Title</u>	<u>Due Date</u>
<input type="checkbox"/> Folio <input type="checkbox"/> Reference		
E		
456.6	fafi	23/11/1996
566	foufou	
0 0		

These books are overdue. You are automatically charged for delay. Any further negligence the Guidance office will be notified.

Stoltzfus Library-List of overdues

ID #: 895011 Khadijeh Murtada

15-Jan-97

<u>Call Number</u>	<u>Title</u>	<u>Due Date</u>
<input type="checkbox"/> Folio <input type="checkbox"/> Reference		
E		
456.6	fafi	23/11/1996
566	foufou	
0 0		

These books are overdue. You are automatically charged for delay. Any further negligence the Guidance office will be notified.

Stoltzfus Library-List of overdues

ID # :

15-Jan-97

Call Number**Title****Due Date**

 Folio Reference

These books are overdue. We are sorry to inform you that the Guidance Office has been notified.

Stoltzfus Library - Recall memo

15-Jan-97

Memo to :

Subject : Recall a book

Please,

Folio Reference

, ,

book has to be returned immediately to the library to be put on reserve.

Any delay you will be charged for it starting, 18/01/1997

Name of Abusing Patrons

15-Jan-97

ID Number	First Name	Middle Name	Last Name
------------------	-------------------	--------------------	------------------

AV Materials Reservation

15-Jan-97

Call Number	Title	Patron	From Date	To Date	Division/Place
-------------	-------	--------	-----------	---------	----------------

ID#

P C

A Patron's Loans

15-Jan-97

ID# Khadijeh

Murtada

Call Number

Title

Author

Folio Reference E

456.6

566

V O C O

fafi

foufou

Dead Loans

15-Jan-97

Call Number

Book

Patron

<input type="checkbox"/> Folio <input type="checkbox"/> Reference
V C

Equipment Reservation

15-Jan-97

Serial #	Eq. Type	From Date	To Date	Patron	Division	Place
223	Over Head Projector	25/10/1996 8:03:47 PM	26/10/1996 8:03:47 PM	ID# 3 Rania	Hannoud	dhg
223	Over Head Projector	25/10/1996 8:03:47 PM	26/10/1996 8:03:47 PM	ID# 3 Rania	Murtada	dhg
223	Over Head Projector	25/10/1996 8:03:47 PM	26/10/1996 8:03:47 PM	ID# 3 Kola	Karaki	dhg
223	Over Head Projector	25/10/1996 8:03:47 PM	26/10/1996 8:03:47 PM	ID# 3 Khadjeh	Murtada	dhg
223	LCD	27/10/1996 8:04:04 PM	28/10/1996 8:04:04 PM	ID# 940101 Watsi		klim
223	LCD	27/10/1996 8:04:04 PM	28/10/1996 8:04:04 PM	ID# 940101 Rania	Yung	klim
223	LCD	27/10/1996 8:04:04 PM	28/10/1996 8:04:04 PM	ID# 940101 Sukayna	Murtada	klim

Hold Notice - Stoltfuz Library

15-Jan-97

Memo to : ,

ID Number =

Folio Reference

is on Hold from , you have 3 days from mentioned day
to come and pick it up, else it will be recirculated.

Thank you

Maps reservations

15-Jan-97

Call Number	Title	Patron	From Date	To Date	Division/Place
		ID#			

C

List of Patrons with Overdues

15-Jan-97

ID#	First Name	Last Name	Category
895011	Khadijeh	Murtada	STD

List of Patrons in

15-Jan-97

ID Number	First Name	Middle Name	Last Name	Status
------------------	-------------------	--------------------	------------------	---------------

payments

15-Jan-97

Receipt#	Patron	Paid-Amnt	Payment Date
222	ID# 4 Rania Murtada	1000	15/10/1996 12:03:50 PM
3	ID# 4 Rania Murtada	2000	10/11/1996 12:00:00 PM
52	ID# 895011 Khadijeh Murtada	1000	18/05/1996 12:00:00 PM
22	ID# 3 Waisi Yung	6000	04/11/1996 2:46:31 PM

Totals : 10000 L.L.

Books on Reserve

15-Jan-97

Call Number	Title	Course No.	Semester	Professor
<input type="checkbox"/> Folio <input type="checkbox"/> Reference E				
123.4	tratata	88	Spring96	R. Hammoud
123				
0 1	ttt			

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