~Entities and its Attributes

**Database- BIG Library**

1. Library Staff (strong) :|person|

* LibID <pri>
* name
* age
* address
* phone
* email
* degree\*
* timings( day{name of days}, startTime, stopTime)
* wages [derived]
* efficiency [derived]

1. LOG (strong) :|place|

* logTime <pri>
* LibID
* leaveTime
* hoursWorked [derived]

1. Membership (strong) :|event|

* AadharNo < pri>
* Image
* date
* LibID
* MemID
* checkIDBanned\*

1. Plans (strong) :|concept|

* planID <pri>
* type
* initialPayment
* issueCharge
* penalyCharge( charge, NODays)
* NoMems [derived]

1. Members (strong) :|person|

* MemID <pri>
* Name
* Addr
* Phone
* Email
* PlanID
* Dues [Derived]
* {BooksID-inPoss}

1. Issues (strong) :|event|

* issueNo. <pri>
* issuedDt
* returnDt

8. Transaction

* TransID
* MemID
* LibID
* TextID
* amount [derived]
* ifPaid

1. Returns (strong) :|event|

generalisation

* returnNo. <pri>
* DateOfRet

1. FineGen (weak) //indentified by Returns// :|concept|

* fineID <par>
* MemID
* latency [derived]
* amount [derived]
* ifPaid

11. Books

* ISBN
* {Authors}
* Publisher
* {copyIDs}

1. Texts (strong) :|thing|

* TextID <pri>
* Name
* {category}
* Location(section, shelf, rack)

specialisation

* language
* Popularity

12. nonIssuables

* PubliDt
* distributer

1. Vendors (strong) :|person|

* vendorName <pri>
* phoneNo
* ratings

1. orderDetails (strong) :|thing|

* orderID <pri>
* date
* vendorName
* textID
* Pricing(price, quantity, disc)
* TotPrice [derived]

1. AccountTransactions (strong) :|event|

specialisation

16. expenditures

* DeBillNo.
* Date/Time
* Description

17. Incomes

* CreBillNo.
* balance

~Relations and Constraints:

1. Manages <unary>
   * One-to-Many
   * (e) LibraryStaff
   * Desc.Attr-> assignDt
2. signInOut <binary>
   * One-to-One
   * (e) LibraryStaff {partial}
   * (e) LOG {total}
3. Provides <binary>
   * One-to-Many
   * (e) LibraryStaff {partial}
   * (e) Membership {total}
4. Offered <binary>
   * One-to-Many
   * (e) Plans {partial}
   * (e) Membership {total}
5. plansUpdate <ternary>
   * One-to-Many
   * (e) Plans {partial}
   * (e) LibraryStaff {partial}
   * (e) Members {total}
   * Desc.Attr-> date
6. Borrowing <binary>
   * (e) Members(0,5)
   * (e) Issues(1,1)
7. Returning <binary>
   * One-to-Many
   * (e) Members {partial}
   * (e) Returns {partial}
8. calcFine <binary> <<Identifying>>
   * One-to-One
   * (e) Returns {partial}
   * (e) FineGen {total}
9. Search <binary>
   * Many-to-Many
   * (e)Members
   * (e)Texts
   * Desc.Attr-> reportID
10. Update <binary>
    * Many-to-Many
    * (e)Texts {total}
    * (e) LibraryStaff {partial}
11. Order <ternary>
    * One-to-Many
    * (e) LibraryStaff {partial}
    * (e) vendors {partial}
    * (e) orderDetails {total}
12. Maintains <binary>
    * One-to-Many
    * (e) LibraryStaff
    * (e) AccountTransactions

Problem Statement:

The library management database keeps track of **library staffs**, **members**, **books**, and other various units of library. One of the **library staff** is assigned to *manage* other staffs. **Staff**’s *shift* or work timings are recorded in the **log** DB. Library Staffs have various jobs. *Providing* new **membership** to numerous people is one of the important job. Every **membership** is completed by *choosing* a member **plan**. This **plan** can later be *updated* by the **members** under the consent of any **library staff**.

**Members** have facility to *search* through diverse collection of **texts**, which consists of all categories of books, articles, magazines, newspaper, etc. **Members** can perform various **transactions** like *borrowing* and *returning* of issuable **texts**. A **member** can have atmost 5 books in possession, which are **issued** from the library. **Fine** is *calculated* on every **return** of book and its amount is dependent on member’s **plan**. Only **library staffs** have permission to *update* the records of the **texts**. These **texts** are usually *ordered* from selected **vendors**. **Staffs** also *maintains* overall monetary **transactions**-track all **expenses** and **incomes** (fundings and other credits).