REALATIONAL DATABASE SCHEMA REPORT

Mapping to Regular Entity types:

- **Staff** table consists of **Eno** (Employee number) as primary key which is also unique and not null. It also has **Sname** and **Jobtype** as participating attributes. (**Assumption:** The subclasses are considered in one table and classified using the attribute **Jobtype**)

- **Member** table consists of **LID** (Library ID) as primary key which is also unique and not null. It also has **SSN, Fname, Lname, Mname, Fullname, Phone, MType, HAddr, CAddr** and **Valid_through** as participating attributes. The attribute SSN is considered as Unique index.

- **Book** table consists of **ISBN** as primary key which is also unique and not null. Other attributes of Book are **Title, Author, Location, Availability** (No. of available copies in hand)**, Is_rent** and **Total_copies**(Total no. of copies existing)**.** Depending upon the binding (Hard cover/Soft cover) / Language / edition of a book having same title, we can make use of the Location and ISBN (unique to each book having same titles) to distinguish and find the book.

- **Catalogue** table consists of **ISBN** as primary key which is also unique and not null. **Description, Subject_area** and **BType**(Book type) are the other participating attributes of the table. **(Assumption:** The subclass BType of Book has been considered in the table Catalogue with an attribute BType.)

Mapping of Binary Relationship Types:

- **Staff - Member- Book:** A relationship named **Checks_out** connects the tables Staff, Member and Book which denotes the process of Staff checking out a book to a Member. The table **Checks_out** has the attributes **Is_overdue** (to check if a book is overdue), **Checkout_date, No_of_books_checkedout, Duedate** and **Gracedate** of which the latter two are derived attributes. (**Assumption:** Any staff can check out a book.)

- **Staff - Member:** A relationship named **Register** connects Staff to Member which denotes the process of Staff carrying out the registration process for Member. **Register** Table denote which staff registered a new membership i.e., **Enum**, **RID.**

- **Staff - Member:** A relationship named **Notice** connects Staff to Member which denotes the process of Staff issuing Notice to a member with a default. **Notice** has three attributes. **NType** - denotes the notice type (Renewal or Overdue), **NTMType**(Notice-to-member type) - denotes the type of member the notice is issued to (Professor or regular), **Date -** denotes date of issue. (**Assumption:** Chief librarian, Assistant librarian and Check out staff can issue a notice to a member)

- **Staff - Book:** A relationship named **Access** is introduced which connects the Staff to Book which shows that the Staff has access to the Book and all its subclasses.

Identified Binary relationships:

Checks_out(Staff – Member) - 1:N – Staff can check out books to any number of members based on the availability of the respective books at a time. After this the availability is updated based on the total copies to check out copies.

Checks_out (Staff-Book) - 1:5 – Staff can check out a maximum of 5 books to a member, for a member cannot have more than 5 books checked out in his tab. Checking out more than 5 books will violate the constraint.

Register (Staff-Member) – 1: N – Staff can register any number of members at a time. After this, every member is issued a member ID based on which a member is identified.

Notice (Staff-Member) - 1: N – Staff can issue notice to any number of members at a time. The notice issuing process differs with the type of notice and the type of member. Also it takes into account the due date and grace period.

Access (Staff-Book) – 1: N – Staff can access any number of books available on the catalogue at a time. The books can be identified using ISBN which is unique to every book and the staff can access information like availability, total copies, title, description.