**Database Management Systems (BCPR203)**

**Design Assignment**

**Sysmex Hospital Database**

The data given in the spreadsheet was segregated to form seven different entities, which includes RefereeType, Referee, Patient, Department, Surgeonss, WaitListPatients and Reference. From the given spreadsheet, year and month was not included as an attribute since the referral date contains the year and month in it. The refereeTypeID, refereeID, patientID, deptID, empID, waitListPatientID is the externally added columns and they are the primary key it is auto incremented as well as NOT NULL. The Name of the entities such as (patientName, referedBy, SurgeonName) are divided into first name and last name.

All the above mentioned entities were obtained through Normalisation.

During the First normal form (1NF) all the given entities were together, which was then further segregated to two more forms and hence resulted in obtaining entities to create an ERD.

**Normalisation**

**Partial Dependency**: One of the primary key determines the other attribute.

**Transitive Dependency**: Non-key attribute determines another attribute.

**First Normal Form(1NF):**

In the first normal form, two entities are obtained which is the primary key.

* **ReferenceID** has the partial dependency with the refDate, refTypeID, refFrom, refereeID, refFirstname, refLastName, FSA, WLD. In which RefereeID is the Primary Key. Where the ReferenceID is unique and it can be chosen as the primary key so that other references related will form a partial dependency
* **PatientID** has the partial dependency with patientFirstName, patientLastName, DOB, gender, NHI, HTA. In which PatientID is the Primary Key. PatientID is unique and it can be used to link with patient details, department, surgeon. hence it is chosen as the primary key
* **DepartmentID** has the transitive dependency with depName.
* **SurgeonID** has the transitive dependency with Surgeon First Name, Surgeon Last Name, empID.
* RefTypeID and refFrom have transitive relation, RefereeID, refereeFirstname and refereeLastName have transitive relation.

**Second Normal Form(2NF)**

In the second normal the non key attribute is dependent on primary key. Where the refereeID, refTypeID, depID and empID are transitive

**Third Normal Form(3NF)**

In the third Normal form six entities are obtained to draw the ERD (ER diagram).

RefereeTypeID, refereeID, reference, patient, surgeon, department

The Primary key of one sided table will be the foreign key of the other sided table.

**Cardinality and Relationships**

From the seven entities, the relationships are obtained.

Patient

Referee

Reference

RefereeType

Surgeon

Department

From the above-mentioned ERD the relationships between each entity is understood clearly. The cross feet is used to indicate the many to one relation.

* RefereeType and the Referee has the one: many relation. The RefereeType can have many referee or one referee, where as the referee has one and only one RefereeType.
* Referee and the Reference has the one: much relation. The Referee can have many reference or one reference, where as the reference has one and only one referee.
* Reference and Patient has many: one relation. The Reference has one and only one patient, whereas the patient can have many or one reference.
* Reference and Surgeon has many: one relation. The reference can have one and only one Surgeon, whereas the Surgeon can have many or one reference.
* Surgeon and Department has many: one relation. The surgeon has one and only one Department, where as the department can have many or one surgeon.

Reference asks as the bridging table in the diagram.

**Database**

Six tables where created for the database “HospitalSysmexDB”

RefereeType, Referees, Patient, Department, Surgeonss and Reference2

RefereeType: refereeTypeID primary key (PK) + refereeFrom

Referees : refereeID (PK) + refereeTypeID foreign Key (FK) + refFirstName+ refLastName

Patient : patientID (PK) + patientFirstName+ patientLastName+ dob+ gender+ NHI+ HTA

Department: depID (PK) + depName

Surgeonss : empID (PK) + depID+ surgeonFirstName+ surgeonLastName+ depID (FK)

Reference2 : refID (PK)+ refDate+ FSA+ WLD+ empID+ refereeID+ patientID+ empID (FK)+ refereeID(FK)+ patientID(FK)

**Insert** statement is used to insert the values into all the created tables and appropriate values are entered into each table. When the values are entered it can be displayed by using the **select** statement.

Once all the tables are created and values are entered into the table the queries are used to obtain the appropriate result.

Five query questions is answered in the Database.

The table doesn’t contain any subtype/supertype

**GitHub Version Control**