ASSIGNMENT:

1.Find the functional dependencies for the below and normalize it till BCNF :

CustID	CustName	AccountManager	AccountManagerRoom	ContactName1	ContactName2
171	ABNAmro	Hans	12	Piet	Koos
190	RaboBank	Guus	15	Mona	Mieke

Sol:- The relation has following Functional Dependencies-

CustID -> CustName
CustID -> AccountManager
CustID -> AccountManagerRoom
CustID -> ContactName1
CustID -> ContactName2
AccountManager -> AccountManagerRoom

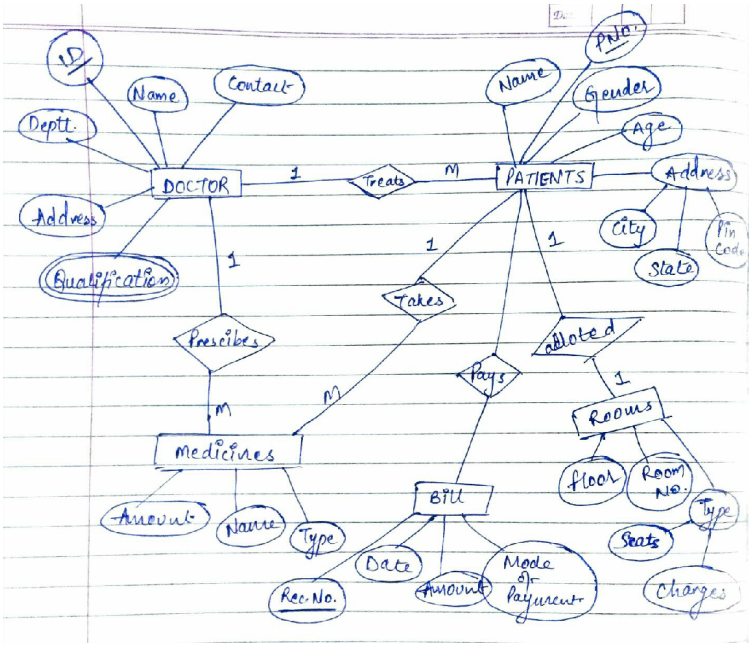
- As all the valus stored in the relation are single-values and unique, hence it is in 1NF.
- Also there is no partial dependency, hence the relation is in 2NF.
- In the relation a transistive dependency is present, so we will split the table to covert it to 3NF.

CustID (Primary Key)	CustName	AccountManager (Foreign Key)	ContactName1	ContactName2

AccountManager (Primary Key)	AccountManagerRoom

2. Draw an ER diagram for a hospital management system.

Sol:- ER Diaram for hospital management system :



3.

Consider a relation Student (StudentID, ModuleID, ModuleName, StudentName, StudentAddress, TutorId, TutorName). Each student is given a StudentID and each module given a ModuleID. A student can register more modules and a module can be registered by more students. TutorID is the ID of the student's personal tutor, it is not related to the modules that the student is taking. Each student has only one tutor, but a tutor can have many tutees. Different students can have the same name. Different students can be living at the same address.

Find all the functional dependencies holding in this relation and normalize the table to 3NF.

Sol:-

StudentID	ModuleID	StudentName	StudentAddress	ModuleName	TutorID	TutorName

Following are the functional dependencies for above relation:

StudentID ->ModuleID
StudentID -> StudentName
StudentId ->StudentAddress
StudentID -> TutorID
ModuleID -> StudentID
ModuleID->ModuleName
TutorID-> TutorName

As it is given that different students can have same name and a tutor is assigned to a student not to the module type. Therefore, StudentID and ModuleID will be the candidate keys.

Hence, to normalise the relation to 3NF following tables will be formed:
R1(StudentID, ModuleID)
R2(StudentID, TutorID) : Due to dependency of tutor on the student
R3(StudentID, StudentName, StudentAddress): Due to partial dependecy of attributes on StudentID
R4(TutorID, TutorName): Due to transitive dependency from
StudentID->TutorID, TutorID->TutorName
R5(ModuleID, ModuleName): Dependency of ModuleName on ModuleID

StudentID (Primary Key)	ModuleID (Primary Key)

StudentID (Primary Key)	TutorID

StudentID (Primary Key)	StudentName	StudentAddress

TutorID (Primary Key)	TutorName

ModuleID (Primary Key)	ModuleName