

Class Activity 5: Normalisation

Lecture 5 Activities

1. Explain two properties that must be satisfied by candidate keys?
 - Unique identification: Its a minimal set of attributes that can be used to identify all attributes of an entity
 - Non-redundancy:
2. Explain the difference between candidate key and primary key.
 - **Candidate key**: A set of attributes that can be used to uniquely identify an entity instace. The PK should be included in the Candidet key
 - **Primary Key**: Often a Single Attribute that can be used to uniquely identify an instance. PK can also be used to determine relation with another entity as a FK
3. Determine the PK of the following relation.

INVOICE (OrderID, ProductID, OrderDate, CustomerID, CustomerName, CustomerAddress, ProductDescription, ProductFinish, ProductStandardPrice, OrderQuantity)

FDs:

- **OrderID, ProductID** > OrderQuantity
- **ProductID** > ProductDescription, ProductFinish, ProductStandardPrice
- **OrderID** > OrderDate, CustomerID, CustomerName, CustomerAddress
- **CustomerID** > CustomerName, CustomerAddress

Right	Mid	Left
OrderId, ProductId	CustomerId	OrderDate, CustomerName, CustomerAddress, ProductDescription, ProductFinish, ProductStandardProce, OrderQuantity

PK: composite - OrderId, ProductId

Tutorial 5 Activities

Write a list of all the functional dependencies (FDs)

For the New Oriental Hospital case study. Use the case study description and the forms in Figures 1-5 to decide what are the business rules and write these as FDs

FD for the **first part** of case study

- **DrugID** > UnitPrice
- **DrugID, ChartID** > AmntPerDay, StartDate, EndDate, Dose, Method
- **InsID** > InsName, InsAddr, InsPhone, InsRep
- **PatID** > PatId, FName, LName, Age, Gender, Addres, DoB, Phone, InsID, InsName, InsAddr, InsPhone, InsRep
- **StaffID** > StaffName, StaffRole

- **MedChartID** > AdmissionDate, DischargeDate, WardNo, Symptom, Diagnosis, PatID, StaffID, {Attributes from Pat}, {Attributes from Staff}

FD for the **second** part of the case study

- **StaffID** > StaffName, Address, Phone, Gender, Dob, Payscale, JobType, Sallary, StartDate, PagerNo, Speciality, Position Type
- **WardNo** > Name, Capacity, Extensiom, Location
- **WardNo, StaffID** > Position, Shift, StartDate,EndDate, {Ward attributes}, {Staff attributes}
- **DrugID** > UnitPrice
- **DrugID, ChartID** > AmntPerDay, StartDate, EndDate, Dose, Method, {MChart attributes}
- **InsID** > InsName, InsAddr, InsPhone, InsRep
- **PatID** > PatId, FName, LName, Age, Gender, Addres, DoB, Phone, InsID, InsName, InsAddr, InsPhone, InsRep
- **MedicalChartID** > AdmissionDate, DischargeDate, Symptom, Diagnosis, {Pat attributes}, {Ward attributes}, {Staff Attributes}
- **MiscNo** > Description, Price
- **MiscNo, BillNumber** > Amount, Charge, {MiscItems}, {Bill attributes}.
- **MedicalBill** > Date, Total, {MiscItems attribute}, {MedicalChart Attributes}

Check the list of relations from Tutorial 4

Solution with the list of functional dependencies to justify whether each relation is in 1NF, 2NF, 3NF. Start with STAFF, PATIENT, COMPANY relations, then check the rest of the relations. (15 Minutes + 5 minutes discussions)

Normalization Check

- **Staff**: 3nf
- **Drug**: 3nf
- **Prescription**: 3nf
- **Ward**: 3nf
- **Shift**: 3nf
- **Patient**: 3nf
- **Insurance**: 3nf
- **MiscItems**: 3nf
- **MiscCharge**: 0nf (derrived attr charge)
- **Bill**: 0nf (derrived attr TotalCost)
- **MedicalChart**: 3nf