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Dental Practice Management System - Mapping to Relations

Conventions and color coding
- Primary Keys are underlined
- Foreign Keys are in Blue

Employee Table

In Employee Table the EmpID (EmployeeID) is the primary key and PracticeID is foreign key which points to Practice table.

Candidate Keys:
a. EmpID
b. SSN

Employee table:

EmpID	SSN	FName	LName	JobRole	Salary	Hours/Week	PracticeID

Functional Dependency:

a. EmpID -> SSN, FName, LName, JobRole, Salary, HoursPerWeek, PracticeID
b. SSN -> EmpID, FName, LName, JobRole, Salary, HoursPerWeek, PracticeID

EmpID	SSN	FName	LName	JobRole	Salary	Hours/Week	PracticeID

Employee Address Table

Employee Address table maps Employee table and different address the employee has. EmpID is the Foreign Key. EmpID along with Emp_Type is the primary key of the table.

Candidate Keys:
   a. EmpID, Emp_Type

Employee-Address Table:

EmpID	Emp_Type	Street	City	Zip

Functional Dependency
   a. EmpID, Emp_Type -> Street, City, Zip

(EmpID, Type combination is primary key of this table)

EmpID	Emp_Type	Street	City	Zip

Feedback Table

Feedback table collects feedbacks from patient. PatientID is the Foreign Key and FeedbackID is the primary key of this table. One patient can only submit one feedback.
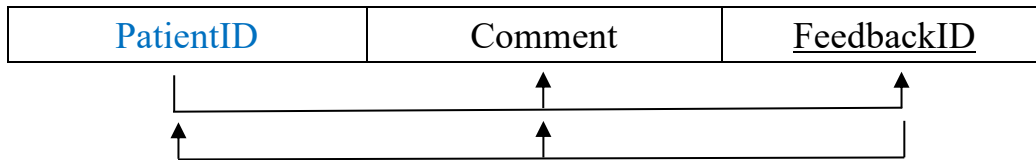
Candidate Keys:
   a. PatientID
   b. FeedbackID

Feedback Table:

PatientID	Comment	FeedbackID

Functional Dependency:
   a. PatientID -> Comment
   b. FeedbackID -> Comment

PatientID	Comment	FeedbackID

Dentist Table

Dentist table is used to determine the specialization of a dentist. EmpID is the foreign key which points to Employee table. EmpID along with specialization is the super key of the table
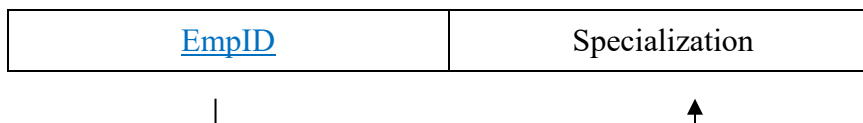
Candidate Keys:
    a. EmpID

Dentist Table:

EmpID	Specialization

Functional Dependency:
    a. EmpID -> Specialization

EmpID	Specialization

Patient Table

Patient table stores patient information. PatientID is the primary key of the table

Candidate Keys:
    a. Email
    b. SSN
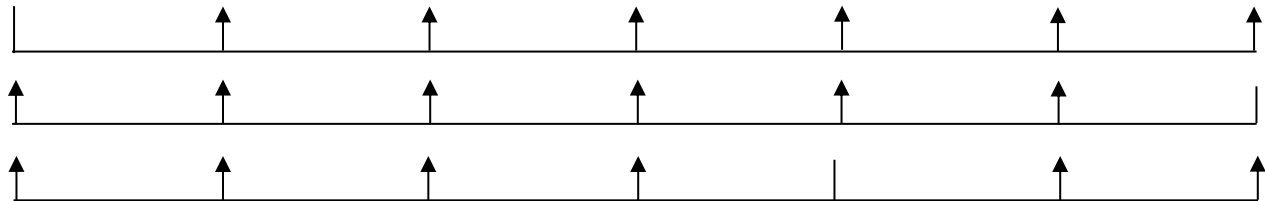   c. PatientID

Patient Table:

PatientID	FName	LName	DOB	SSN	Gender	Email

Functional Dependency:

a. Email -> PatientID, SSN, FName, LName, DOB, Gender
b. SSN -> PatientID, Email, FName, LName, DOB, Gender
c. PatientID -> Email, SSN, FName, LName, DOB, Gender

PatientID	FName	LName	DOB	SSN	Gender	Email

Insurance Table

Insurance table contains patients insurance information. InsID (InsuranceID) is the Primary Key of the table

Candidate Keys:
a. InsID

Insurance Table:

InsID	Name	Ins_Type	coverage	Duration	Plan

Functional Dependency:
a. InsID -> Name, Type, coverage, Duration, Plan

InsID	Name	Ins_Type	coverage	Duration	Plan

Patient Insurance

Patient Insurance table contains insurance information of patients. InsID, PatientID (InsuranceID) is the Primary Key of the table. The foreign keys InsID points to Insurance table and PatientID points to patient table

Candidate Keys:
a. PatientID, InsID

Patient-Insurance Table:

PatientID	InsID	Premium

Functional Dependency:
   a. PatientID, InsID -> Premium

PatientID	InsID	Premium

Operatory Table

Operatory information captures the number of chairs in a practice. OperatoryID is the Primary Key of the table and PracticeID is the Foreign Key of this table.

Candidate Keys:
   a. OperatoryID

Operatory Table:

OperatoryID	RoomNo	PracticeID	Op_Type

Functional Dependency:
   a. OperatoryID -> PracticeID, RoomNo, Op_Type

OperatoryID	RoomNo	PracticeID	Op_Type

Drugs Table

Drug table captures the drug name and it's price. DrugID is the Primary Key of the table

Candidate Keys:
   a. DrugID

Drug Table:

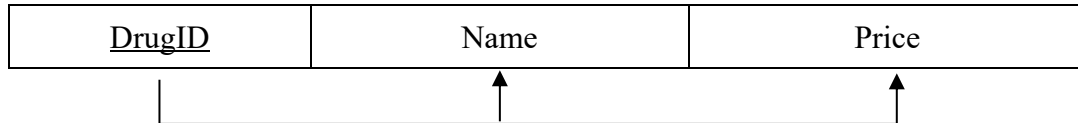| DrugID	Name	Price

Functional Dependency:
   a. DrugID -> Name, Price

DrugID	Name	Price

Materials Table

Materials table captures the different materials that are used for treatment. MaterialID is the Primary Key of this table.
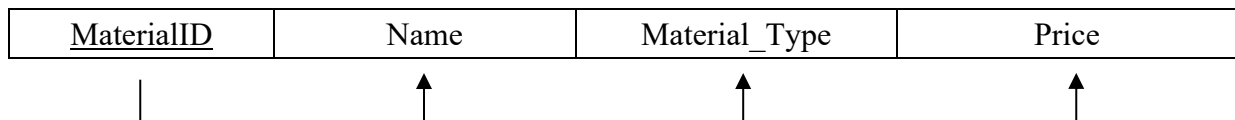
Candidate Keys:
   a. MaterialID

Materials Table:

MaterialID	Name	Material_Type	Price

Functional Dependency:
   a. MaterialID -> Name, Price, Material_Type

MaterialID	Name	Material_Type	Price

Treatment Table

Treatment table captures the treatment information of a patient. TxID(TreatmentID) is the Primary Key. PracticeID (Practice Table), OpID (Operatory table), PatientID (Patients table) are Foreign Keys.

Candidate Keys:
   a. TxID

Treatment Table:

Tx_ID	Tooth	Description	DateTime	Phase	Tx_Type	Surface	Status	OpID	PatientID

Functional Dependency:
  a. Tx_ID -> PatientID, OpID, Tooth, Description, DateTime, Phase, Tx_Type, Surface, Status

Tx_ID	Tooth	Description	DateTime	Phase	Tx_Type	Surface	Status	OpID	PatientID

Treatment-DoneBy Table

This table captures who did the treatment for the patient, either dental hygienist or dentist. TID (Treatment table) and EmpID (Employee table) are the fields of this table.

Candidate Keys:
  a. TID, EmpID

Treatment-DoneBy table:

TID	EmpID

Dependent Table

Dependent table captures the relatives of a patient such as child, spouse etc. PatientID (Patient table) is the Foreign Key of this table and PatientID along with Name is the partial key

Partial Keys:
  a. PatientID, Name

Dependent Table:

PatientID	Name	DOB	Gender	Relationship

Functional Dependency:
  a. PatientID, Name -> Relationship, DOB, Gender

PatientID	Name	DOB	Gender	Relationship

LabTest Table

Lab test table contains results of test done by patients. EmpID (Employee table) and TID (Treatment table) are the Foreign Keys and TestID is the Primary Key.

Candidate Keys:
   a. TestID

LabTest table:

TestID	Name	Type	Pat amount	Practice cost	Result	Status	EmpID	TID

Functional Dependency:
   a. TestID -> Name, Type, PatAmount, PracticeCost, Result, Status, EmpID, TID

TestID	Name	Type	Pat amount	Practice cost	Result	Status	EmpID	TID

Treatment-Drugs Table

Treatment-Drugs table captures the drugs that are prescribed for patients. TreatmentID along with DrugID is the Primary Key and TreatmentID (Treatment table) and DrugID (Drug table) are the Foreign Keys.

Candidate Keys:
   a. TreatmentID, DrugID

Treatment-Drug Table:

TID	DrugID	Dosage	Days

Functional Dependency:
   a. TreatmentID, DrugID -> Dosage, Days

TID	DrugID	Dosage	Days

Treatment-Materials Table

Treatment-Materials table captures the different materials that are used for treatments. TID (Treatment table) and MaterialID (Materials table) are the Foreign Keys.

Candidate Keys:
   a. TID, MaterialID

Treatment-Materials table:

TID	MaterialID

Appointment Table

Appointment table captures the appointments that are taken by the patients. ApptID is the Primary Key of this table. PatientID (Patients table) and EmpID (Employee table) are the Foreign Keys

Candidate Keys:
   a. ApptID,

Appointment Table:

ApptID	DateTime	PatientID	EmpID	Status

Functional Dependency:
   a. ApptID -> DateTime, PatientID, EmpID, Status

ApptID	DateTime	PatientID	EmpID	Status

Payment Plan

Payment plan captures the billing information of a treatment done by patient. BillID is the Primary Key. TID (Treatment table) is the Foreign Keys of this table.

Candidate Keys:
   a. BillID

Payment Plan table:

BillID	InsAmount	PatAmount	Status	DateTime	TID

Functional Dependency:
   a. BillID -> InsAmount, PatAmount, Status, DateTime, TID

BillID	InsAmount	PatAmount	Status	DateTime	TID

Practice Table

Practice table contains the address of practice and the practice manager. PracticeID is the Primary Key. Mgr_EmpID (Employee table) is the Foreign Key this is used to identify the manager of that practice.

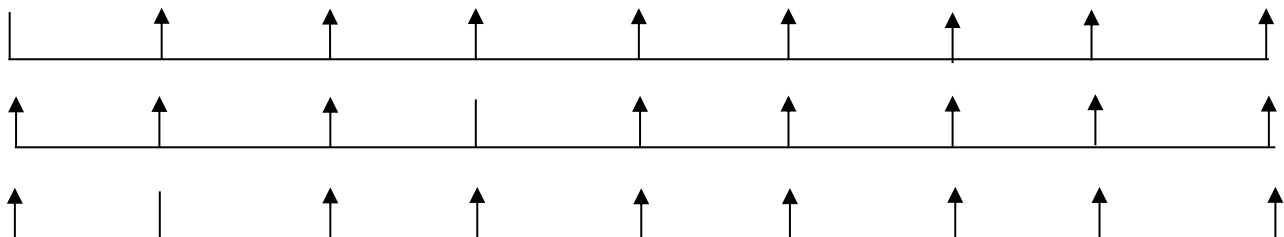Candidate Keys:
   a. NPI
   b. TaxID
   c. PracticeID

Practice Table:

PracticeID	NPI	Name	TaxID	Phone	Street	City	Zip	MgrEmpID

Functional Dependency:
   a. NPI -> PracticeID, TaxID, Mgr_EmpID, Name, Phone, Street, City, Zip
   b. TaxID -> PracticeID, NPI, Name, Phone, Street, City, Zip, Mgr_EmpID
   c. PracticeID -> NPI , Name, TaxID, Phone, Street, City, Zip, Mgr_EmpID

PracticeID	NPI	Name	TaxID	Phone	Street	City	Zip	MgrEmpID

Relationship Mapping

Employee

EmpID	SSN	FName	LName	JobRole	Salary	Hours/Week	PracticeID

Employee-Address

EmpID	Type	Street	City	Zip

Dentist

EmpID	Specialization

Feedback

PatientID	Comment	FeedbackID

Operatory

OperatoryID	RoomNo	PracticeID	Type

Patient

PatientID	FName	LName	DOB	SSN	Gender	Email

Patient-Insurance

PatID	InsID	Premium

Insurance

InsID	Name	Type	%covered	Duration	Plan

Drug

DrugID	Name	Price

Treatment-Material

TID	MaterialID

Material

MaterialID	Name	Type	Price

Treatment

TID	Tooth	Description	DateTime	Phase	Type	Surface	Status	OpID	PatientID

Treatment-Drugs

TID	DrugID	Dosage	Days

Dependent

PatientID	Name	DOB	Gender	Relationship

LabTest

TestID	Name	Practice cost	Pat amount	Type	Result	Status	EmpID	TID

Treatment-DoneBy

TID	EmpID

Appointment

ApptID	EmpID	Status	PatientID

PaymentPlan

BillID	InsAmount	PatAmount	Status	DateTime	TID

Practice

PracticeID	MgrEmpID	Name	TaxID	Phone	Street	City	Zip	NPI