Lab 3

Khalisa

People (<u>PersonID</u>, Name, Address, Zip, School, PhoneNo, Email,CityName,StateName)
Keys:{PersonID}
Primary Key: {PersonID}
FDs:PersonID → Name, Address, Zip, School, PhoneNo, Email
Address → Zip,CityName,StateName
PhoneNo → Name
Email → Name

Minimal basis:
PersonID→Address
PersonID→School
PersonID→PhoneNo
PersonID →Email
Address → Zip
PhoneNo → Name
Email → Name

Decomposition:
R1(<u>Address</u>, Zip, CityName, StateName),
FDs: Address —> Zip, CityName, StateName
R2(<u>PersonID</u>, Address, School, PhoneNo, Email),
FDs: PersonID —> Address, School, PhoneNo, Email
R3(<u>PhoneNo</u>, Name),
PhoneNo —> Name
R4(<u>Email</u>, Name)
Email —> Name

```
CREATE TABLE Address_T(
Address VARCHAR(100) PRIMARY KEY,
Zip INT NOT NULL,
CityName VARCHAR(50) NOT NULL,
StateName VARCHAR(50) NOT NULL
);

CREATE TABLE People(
PersonID int PRIMARY KEY,
Address VARCHAR(100) NOT NULL,
School VARCHAR(100),
PhoneNo CHAR(10) NOT NULL,
Email VARCHAR(80) NOT NULL,
FOREIGN KEY (Email) REFERENCES Email_T (Email)
```

FOREIGN KEY (AddressID) REFERENCES Address_T(Email)
);

CREATE TABLE Phone(
PhoneNo char(20) PRIMARY KEY,
Name VARCHAR(50) NOT NULL
);

CREATE TABLE Email_T(
Email VARCHAR(80) PRIMARY KEY,
Name VARCHAR(50) NOT NULL
);

Equipment(<u>ID, LName, LSchool,</u> Model No., Date Purchased, Name)
Keys: {ID, LName, LSchool}
Primary Key: {ID, LName, LSchool}
FDs: Model No. → Name
ID, LName, LSchool → Model No., Date Purchased, Name

Minimal basis:
Model No. → Name
ID, LName, LSchool → Model No.
ID, LName, LSchool → Date Purchased

Decomposition:
R1(<u>Model No.</u>,Name) R2(<u>ID, LName, LSchool</u>, Model No., Date Purchased)

CREATE TABLE Equipment (
ID int,
LName NCHAR(40),
LSchool NCHAR(40),
ModelNo VARCHAR(80) NOT NULL,
DatePurchased DATE,
Name VARCHAR(50) NOT NULL,
PRIMARY KEY (ID, LName, LSchool),
FOREIGN KEY (Lname, LSchool) REFERENCES Laboratory (LName, LSchool)
);

Dong Yunxing

Laboratory(<u>LName, LSchool,</u> Location)
Keys: {LName, LSchool}
Primary Key: {LName, LSchool}
FDs: LName, LSchool→ Location

It is in 3NF.

ResearchLab (<u>LName, LSchool</u>)
Keys: {LName, LSchool}
Primary Key: {LName, LSchool}
FDs:

It is in 3NF.

TeachingLab(<u>LName, LSchool</u>)
Keys: {LName, LSchool}
Primary Key:{LName, LSchool}
FDs:

It is in 3NF.

Experiments(<u>LName, LSchool,StudentID,</u> Attendance, Date/Time)
Keys:{LName, LSchool,StudentID,Date/Time}
Primary Key:{LName, LSchool,StudentID}
FDs: LName, LSchool,StudentID, Date/Time→ Attendance

It is in 3NF.

Undergraduates(<u>StudentID)</u>
Keys:{StudentID}
Primary Key:{StudentID}
FDs:

It is in 3NF.
Wang Yilin
City(<u>Name, StateName)</u>
Keys:{Name, StateName}
Primary Key: {Name, StateName}
FDs:

It is in 3NF.

State(<u>StateName)</u>
Keys: {StateName}
Primary Key: {StateName}
FDs:

It is in 3NF.

Professors (<u>PersonID</u>, Field-of-Expertise)
Keys: {PersonID}
Primary Key: {PersonID}
FDs: PersonID → Field-of-Expertise

It is in 3NF.

Course (<u>Date&Time</u>, <u>Index</u>)
Keys: {<u>Index, Date&Time</u>}
Primary Key: {<u>Index, Date&Time</u>}
FDs: Index → Date&Time

It is in 3NF.

Take (<u>PersonID</u>, <u>CIndex#</u>, Date&Time)
Keys: {PersonID, CIndex#}
Primary Key: {PersonID, CIndex#}
FDs:PersonID, CIndex# → Date&Time

It is in 3NF.
Taylor

CREATE TABLE Student(
  PersonID int NOT NULL,
  Major_Minor nchar(50),
  Admission_Date date NOT NULL,
  StudentID int NOT NULL,
  PRIMARY KEY(PersonID, StudentID),
  FOREIGN Key(PersonID)
    REFERENCES People (PersonID)
);

CREATE TABLE Graduates(
  StudentID int NOT NULL,
  PRIMARY KEY (StudentID),
  CHECK (StudentID IN (SELECT StudentID FROM Student))
);

CREATE TABLE Teach (
  PersonID int NOT NULL,
  Date_Time nchar(50),
  IndexNumber int NOT NULL,
  PRIMARY KEY (PersonID, Date_Time, IndexNumber),
  FOREIGN KEY(PersonID)

CREATE TABLE Research (
  Topic nchar(50),
  ProfessorID int,
  StudentID int,
  LName nchar(50),
  LSchool nchar(50),
  PRIMARY KEY(TOPIC, ProfessorID, StudentID,LName, LSchool)
  FOREIGN KEY(ProfessorID, LName, LSchool, StudentID)
    REFERENCES People (PersonID),
    REFERENCES Laboratory (LName)
    REFERENCES Laboratory (LSchool)
    REFERENCES Student (StudentID)
);

Teach (PersonID, Date&Time, Index)
Keys: {PersonID, Date&Time, Index}
Primary Key: {PersonID, Date&Time, Index}
FDs:

It is in 3NF.

Student (PersonID, Major&Minor, Admission-Date, StudentID)
Keys: {PersonID}
Primary Key: {PersonID}
FDs:
StudentID → Admission-Date, Major&Minor
PersonID→ Major&Minor,Admission-Date,StudentID

Minimal basis:
PersonID→StudentID
StudentID→ Admission-Date
StudentID→ Major&Minor

Decomposition:
R1(PersonID,StudentID)
CREATE TABLE STUDENT1 (
  StudentID int NOT NULL
  PersonID int NOT NULL

PRIMARY KEY(PersonID, StudentID)
FOREIGN KEY(PersonID)
   People (PersonID)
);

R2(StudentID,Major&Minor,Admission-Date)
CREATE TABLE STUDENT2 (
  StudentID int NOT NULL
  Major_Minor nchar(50)
  Admission_Date nchar(50) NOT NULL
  PRIMARY KEY(StudentID)
  FOREIGN KEY(StudentID)
   Student1(StudentID)
);

Research (Topic, ProfessorID, StudentID,LName, LSchool)
Keys: {Topic, ProfessorID, StudentID,LName, LSchool}
Primary Key: {Topic, ProfessorID, StudentID,LName, LSchool}
FDs:StudentID → LName, LSchool

Graduate (StudentID)
Keys: {StudentID}
Primary Key: {StudentID}
FDs:

It is in 3NF.
Thijs
Staff (PersonID,StaffID, Position, DateHired)
Keys: {PersonID}, {StaffID}
Primary Key: PersonID
FDs: PersonID → StaffID,Position,DateHired
StaffID → PersonID
StaffID → Position, DateHired

Minimal basis:
PersonID→ StaffID
StaffID→ PersonID
StaffID→ Position,DateHired

Admin (PersonID)
Keys: {PersonID}
Primary Key: {PersonID}
FDs:

It is in 3NF.

TechnicalStaff (<u>PersonID,</u> LabName, LabSchool)
Keys: {PersonID}
Primary Key: {PersonID}
FDs: PersonID-> LabName, LabSchool

It is in 3NF.

Stakeholders (<u>PersonID</u>, Domain)
Keys: {PersonID}
Primary Key: {PersonID}
FDs: PersonID -> Domain

It is in 3NF.

CommentsSuggestions (<u>CsID</u>, DateTime, Topic, StakeholderID)
Keys:{CsID}
Primary Key:{CsID}
FDs: CsID -> DateTime, Topic, StakeholderID

It is in 3NF.