SC2207 Lab 3

Assumption: use ER approach for subclasses

Person (Person_ID, Email, Phone, Name, Address, City, State, Zip, Schools)

i) Keys: Person_ID

ii) FDs:

1) Person_ID -> Name, Email, Phone, Address, City, State, Zip, Schools
2) Address -> City, State, Zip
3) Zip -> City, State
4) Person_ID -> Name

iii) The relation is not in BCNF

New Table:

Person2 (Person_ID, Name, Email, Phone, Address, Schools)

i) Keys: Person_ID

ii) FDs: Person_ID -> Name, Email, Phone, Address, Schools

Addresses (Address, Zip)

i) Keys: Address

ii) FDs: Address -> Zip

Zips (Zip, City, State)

i) Keys: Zip

ii) FDs: Zip -> City, State

Stakeholder (Person_ID, Domain)

i) Keys: Person_ID

ii) Primary Key: Person_ID

iii) FDs:

1) Person_ID -> Domain

Professor (Person_ID, Field_of_Expertise)

i) Keys: Person_ID

ii) Primary key: Person_ID

iii) FDs:

1) Person_ID -> Field_of_Expertise

Student (Person_ID, Student_ID, Admission_Date, Major&Minor)

i) Keys: Person_ID, Student_ID

ii) Primary key: Student_ID

iii) FDs:

1) Student_ID -> Person_ID, Admission_Date, Major&Minor

2) Person_ID -> Student_ID, Admission_Date, Major&Minor

Staff (Person_ID, Staff_ID, Date_Hired, Position)

i) Keys: Person_ID, Staff_ID

ii) Primary key: Staff_ID

iii) FDs:

1) Staff_ID -> Person_ID, Date_Hired, Position

2) Person_ID -> Staff_ID, Date_Hired, Position

Comment (Person_ID, Topic, Date-Time)

i) Keys: Person_ID

ii) FDs:

1) Person_ID -> Topic, Date-Time

Course (Course_ID, Course_name)

i) Keys: Course_ID

ii) FDs:

1) Course_ID -> Course_name

Teach (Professor.Person_ID, Professor.Field_of_Expertise, Course_ID, lesson_Date)

i) Keys: {Professor_ID, Professor.Field_of_Expertise, Course_ID}

ii) FDs:

1) Professor.Person_ID, Course_ID, Professor.Field_of_Expertise -> lesson_Date

Enrol (Student_ID, Course_ID , Enrollment_date)

i) Keys: {Student_ID, Course_ID}

ii) FDs:

1) Student_ID, Course_ID -> Enrollment_date

Graduate (Student_ID, Thesis_Paper, Professor.Person_ID)

i) Keys: Student_ID

ii) FDs:

1) Student_ID -> Thesis_Paper, Professor.Person_ID

Undergraduate (Student_ID, GPA)

i) Keys: Student_ID

ii) FDs:

1) Student_ID -> GPA

Administrative_Staff (Staff_ID, Office_School, Office_Name)

i) Keys: Staff_ID

ii) FDs:

1) Staff_ID -> Office_School, Office_Name

Technical_Staff (Staff_ID, Lab_School, Lab_Name)

i) Keys: Staff_ID

ii) FDs:

1) Staff_ID -> Lab_School, Lab_Name

Office (Office_School, Office_Name, Location, Phone_Number)

i) Keys: Office_School, Office_Name

ii) FDs:

1) Office_School -> Location

2) Office_Name -> Phone_Number

Laboratory (Lab_School, Lab_Name, Location)

i) Keys: Lab_School, Lab_Name

ii) FDs:

1) Lab_School -> Location

Teaching_lab (Lab_School, Lab_Name, Subject)

i) Keys: {Lab_School, Lab_Name}

ii) FDs:

1) Lab_School, Lab_Name -> Subject

Research_lab (Lab_School, Lab_Name, Specialization)

i) Keys: {Lab_School, Lab_Name}

ii) FDs:

1) Lab_School, Lab_Name -> Specialization

Research (Lab_School, Research_Topic ,Lab_Name, Student_ID)

i) Keys: {Student_ID, Research_Topic}

ii) FDs:

1) Research_Topic, Student_ID -> Lab_Name, Lab_School

Experiment (Lab_School, Lab_Name, Student_ID, Date, Topic)

i) Keys: {Lab_School, Lab_Name, Student_ID, Date}

ii) FDs:

1) Lab_School, Lab_Name, Student_ID, Date -> Topic

Timetable (Course_ID, Professor.Person_ID, Student_ID, Date-Time, If_Clash)

i) Keys: {Professor.Person_ID, Student_ID, Date-Time) OR (Course_ID, Student_ID}

ii) FDs:

1) Student_ID, Course_ID, Date-Time -> Professor.Person_ID, If_Clash

2) Professor.Person_ID, Date-Time -> Course_ID

Equipment (Lab_School, Lab_Name, Equipment_ID, Equipment_Name, Date_Purchased, Model_No)

i) Keys: {Lab_School, Lab_Name, Equipment_ID}

ii) FDs:

1) Lab_School, Lab_Name, Equipment_ID -> Equipment_Name, Date_Purchased, Model_No

2) Model_No -> Equipment_Name

iii) The relation is not in BNCF

New Table:

Equipment2 (Lab_School, Lab_Name, Equipment_ID, Date_Purchased, Model_No)

i) Keys: {Lab_School, Lab_Name, Equipment_ID}

ii) FDs:

1) Lab_School, Lab_Name, Equipment_ID -> Date_Purchased, Model_No

Models (Model_No, Equipment_Name)

i) Keys: Model_No

ii) FDs:

1) Model_No -> Equipment_Name

Assumptions:

1. For each zip code, there is only one city and state
2. For each city, state and address, there is only one zip code
3. Each student has an unique email address
4. Each person only attends one school
5. Each model_no is unique