ISTE-230 Introduction to Database & Data Modeling

## Practice Exercise # 5 – Normalization through 2NF

**Name: Korben Reehill**

**All assignments will be graded with regard to the standards that were discussed in class, which can be found in the Standards Content area.**

For each problem below, given the original relation and functional dependencies, normalize the original and all resulting relations to 2NF. Be sure to use proper relational notation: RELATION(pkattr, attribute, *fkattr*). Include reference statements for foreign keys.

**Problem #1**



EMPLOYEE2(empID, name, deptName, salary, courseTitle, dateCompleted)

Functional Dependencies:

empID, courseTitle 🡺 name, deptName, salary, dateCompleted

empID 🡺 name, deptName, salary

**YOUR ANSWER (Final set of relations normalized to 2NF):**

COURSE(*empID*, coursetitle, dateCompleted)

EMPLOYEE(empID) must exist in COURSE(*empID*)

EMPLOYEE(empID, name, deptName, salary)

**Problem #2**

ENGINEER\_SERVICE(empID, firstName, lastName, email, serviceID, serviceName)

Functional Dependencies:

empID, serviceID 🡺 firstName, lastName, email, serviceName

empID 🡺 firstName, lastName, email

email 🡺 empID, firstName, lastName

serviceID 🡺 serviceName

**YOUR ANSWER (Final set of relations normalized to 2NF):**

SERVICE(serviceID, serviceName)

EMPLOYEE (empID, firstName, lastName, email)

ENGINEER\_SERVICE(*empID*, *serviceID*)

SERVICE(serviceID) must exist in ENGINEER\_SERVICE(*serviceID*)

EMPLOYEE(empID) must exist in ENGINEER\_SERVICE(*empID*)

**Problem #3**



MOVIE(title, year, length, type, studio, star)

Functional Dependencies:

title, star 🡺 year, length, type, studio

title 🡺 year, length, type, studio

**YOUR ANSWER (Final set of relations normalized to 2NF):**

MOVIE(title, year, length, type, studio)

STAR(star)

MOVIE\_STAR(*title*, *star*)

MOVIE(title) must exist in MOVIE\_STAR(*title*)

STAR(star) must exist in MOVIE\_STAR(*star*)

**Problem #4**

APPOINTMENT(clientID, providerID, apptDate, startTime, endTime, firstName, lastName, notes, street, city, state, zipcode, phone, fName, lName,cellNum, serviceID, serviceName, price, duration, description, email)

Functional Dependencies:

clientID, providerID, apptDate, serviceID, startTime 🡺 endTime, firstName, lastName, notes, street, city, state, zipcode, phone, fName, lName, cellNum, serviceName, price, duration, description, email

clientID 🡺 firstName, lastName, street, city, state, zipcode, phone, email

email 🡺 clientID, firstName, lastName, street, city, state, zipcode, phone

providerID, serviceID 🡺 price

providerID 🡺 fName, lName, cellNum

serviceID 🡺 serviceName, duration, description

**YOUR ANSWER (Final set of relations normalized to 2NF):**

CLIENT(clientID, firstName, lastName, street, city, state, zipcode, email)

PROVIDER(providerID, fName, lName, cellNum)

SERVICE(serviceID, serviceName, duration, description)

PRICE(*providerID*, *serviceID*, price)

PROVIDER(providerID) must exist in PRICE(*providerID*)

SERVICE(serviceID) must exist in PRICE(*serviceID*)

APPOINTMENT(apptDate, startTime, endTime, notes, *clientID*, *serviceID*, *providerID*)

CLIENT(clientID) must exist in APPOINTMENT(*clientID*)

PROVIDER(providerID) must exist in APPOINTMENT(*providerID*)

SERVICE(serviceID) must exist in APPOINTMENT(*serviceID*)