**Exercise 1 Answer**

**Assumptions:**

1. An employee can have 1 job
2. Hourly Billing rate (CHG\_HOUR) depends on employee’s position

**First Normal Form**

(project\_num, emp\_number)->(project\_name, employee\_name, job\_class, chg\_hours, hours)

ORIGINALTABLE (project\_num, emp\_number, project\_name, employee\_name, job\_class, chg\_hours, hours)

**Second Normal Form**

Second normal form indicates that there should be no repeating data. If there is repeating data, move it to a separate table. In this table, we have repeating data in the project number, project name, employee number, employee name, job class, and chg\_hours(hourly rate) columns.

In order to move the repeating data to separate tables, we need to look for the functional dependencies

ProjectNumber->ProjectName

EmployeeNumber->EmployeeName, JobClass, Chg\_Hours(Hourly\_Rate)

PROJECT(ProjectNumber, ProjectName)

EMPLOYEE(EmployeeNumber, EmployeeName, JobClass, Chg\_Hours(HourlyRate))

ORIGINALTABLE(ProjectNumber, EmployeeNumber, Hours)

**Third Normal Form**

There should be no transitive dependency?

Look at the assumptions given in the slide’s notes:

1. An employee can have 1 job
2. Hourly Billing rate (CHG\_HOUR) depends on employee’s position

JobClass-> Chg\_Hours(HourlyRate) (This is the given assumption)

EmployeeNumber-> Chg\_Hours(HourlyRate) (This is from my second normal form)

This overlap is called transitive dependency.

JOB(JobClass, Chg\_Hours(Hourly Rate))

PROJECT(ProjectNumber, ProjectName)

Foreign Key

EMPLOYEE(EmployeeNumber, EmployeeName, *JobClass*)

ASSIGMENT(ProjectNumber, EmployeeNumber, Hours)

1 ∞ ∞ 1

Project

Assignment

Employee

∞

1

Job