In this project, implemented a functioning of company schema using a relational DBMS. Used the MySQL system, and its SQL programming facility, by creating tables, populating them with data, and querying and updating the tables.

Following are the requirements to be executed in separated tasks,

1. Create the following tables from the COMPANY database: EMPLOYEE, DEPARTMENT, PROJECT, WORKS_ON, DEPT_LOCATIONS, DEPENDENT (these correspond to 3.7 (6^{th} edition) or 5.7 (7^{th} edition) of the textbook) using SQLPLUS. Write your CREATE TABLE statements in a text file and execute the commands from the file through SQLPLUS. You **should capture the execution in a spool file** that will be turned in. Specify appropriate key and referential integrity constraints. Choose appropriate data types for each attribute. (Important Note: Because there are **circular references** in the referential integrity constraints, you may have to *add some referential integrity constraints later, after the tables are first created without these constraints*).

2. Write one or more database programs to load the records that will be provided to you into each of the tables that you created. (Note: Again, here you may have to *insert some records with NULL for some of their foreign keys* and then update the foreign key values after the records that they reference are inserted (because of the circular references)). You can use any programming or scripting language you are familiar with (JAVA with JDBC, PERL, PHP, Python, C#, C or C++ etc.).

3. Write SQL commands for the updates that are provided in section 2. **First, execute the updates** one after the other and see which updates violate integrity constraints and which do not. **Then, execute the retrieval queries** (see item 4 below) and display their results.

4. Write down the queries in SQLPLUS for the English queries that are provided in section 2. Execute each query and display its results.

5. Execute 3 more Insert commands in SQLPLUS that attempt to insert 3 more records, such that the records **violate the integrity constraints**. Make each of the 3 records violate a *different type* of integrity constraint.

6. Execute a command in SQLPLUS to **delete** a record that violates a referential integrity constraint.

7. Repeat 5 but Insert three new records that **do not violate any integrity constraints**.

SECTION II
SQL Commands (for item 3 and 4)

For item 3),
Apply the following queries and display the result of each query:

1. Select all the attributes for all employees whose last name is 'Jones' or ‘James’.
2. Select all the attributes for all employees whose first name is 'Kim' or ‘Wilson’.
3. Select the names and Ssn of employees who work on more than one project and count the total hours that the employees work on.
4. For each PROJECT, retrieve the project name, number, and location plus the number of employees who works on the project.
5. For each employee who works in department 5 on a project in Houston, retrieve the employee’s Ssn, first and last names, and the project number, name, and hours for each project that the employee works on.
6. Retrieve the last name and first name of all employees who work more than 40 hours per week total (on all their projects).
(1) Select the first and last name of each employee who is a supervisor, plus count the total number of employees supervised by each supervisor.
(2) For each project determine the total hours that employees work on that project per week.
8. Find which employee has more than 2 dependents.
9. Find which employee has more than 1 children.
10. Find all the employee who works in the department that is located in Atlanta. Select their first name and last name.
11. Find all the departments located in Houston and list how many projects are their under those departments.

For item 4),
Apply the following updates (some of the updates will violate integrity constraints). Document clearly which updates succeeded, and which failed, and the kind of integrity constraint violation that caused it to fail:

1. Insert a record ('Services', 1, '123456789', '11-AUG-2012') into DEPARTMENT.
2. Insert a record ('Purchasing', 3, '990110110', '02-FEB-2013') into DEPARTMENT.
3. Insert a record ('Customers', 12, '333445555', '14-JAN-2013') into DEPARTMENT.
4. Update the Dnumber of the DEP_LOCATIONS record with Dlocation='Seattle' to 9.
5. Update the Salary of the EMPLOYEE record with SSN=444444444 to 55000.
6. Insert a record ('Jane', 'B', 'Smith', '666666606', '01-MAR-1980', '3556 W Second Street,Miami,FL', 'F', 85000, '666666603', 5) into EMPLOYEE.
7. Update the hours of the WORKS_ON record with Pno=1 for the employee with SSN='666884444' to 25.

8. Delete the EMPLOYEE record with Ssn= '432765098'.
   Delete the DEPARTMENT record with DNUMBER = 9.
   Delete all the dependents of employee with Ssn = '666666608'