**Computer Science 631**

Database System Design Term Project

In this term project, you are asked to design a small database system, create, and populate this database using ORACLE, MySQL, SQL server, DB2 and write 2 application programs to access the database. The topic of the project is to design the database system that a car dealer can use to manage car sales, service appointments and service rendering, and some sale statistics per car type. In the following, you are given a project guideline (Section 1), the requirements for the database design (Section 2) and the requirements for application design (Section 3).

# GENERAL GUIDELINES

The following guidelines apply for the project:

* 1. The projects will be done in **groups of two**. You should form your own groups and post a message in the “Module 02 Discussion 01: Term Project Groupings” discussion board on Canvas.
  2. You are required to demonstrate your programs. You should treat these demonstrations as if you were giving them to your customer. So, prepare them professionally. The demonstrations will take place at the end of the term, after classes are over (It is better to have a Web-based application, you can use your own computer or the NJIT computers). We will put up a sign-up sheet before the demo.
  3. You are required to submit a typed project report at the end of the process. This report should minimally cover (a) a summary of the system requirements and any additions you may have made; (b) Database design (the entity-relationship design, the relational logical database design, and the application program design; (c) a user manual (instructions to use the system). For each of the items in the design part, you should identify the major design decisions that you faced and the design decisions that you made with justifications for those decisions. Also include, as an appendix, a list of the relational instances you have used to populate your database. Your report should sale your work! Write your report in a way to make your design and implementation part easy to understand and modify for a computer programmer. The user manual part should be directed towards users with no computer background and should contain all the information needed to run the applications.

# DATABASE DESIGN REQUIREMENTS

The following list is a collection of information to be recorded in company Best-P personnel

database:

* The company is organized into division and each division has a set of departments. Each department oversees a set of projects. The department has a set of rooms in different buildings that are used as offices or conference rooms.
* An employee works for a department, but a few employees work for the divisions with no affiliation to any department.
* The buildings are identified by a code but have names and the company also records the year each building was built or bought and how much it cost.
* Every department has a department head, and every division has a division head. The head a division is picked from a department and keeps his affiliation to that department.
* An employee can work on 1 project at a time, but the company would like to keep track of all the project an employee has worked on, the time he/she has spent on each project and the role they played in the project
* Each project has only one manager.
* Several employees can share an office; each office has a set of phones, one for each of the employee sharing the office.
* A preliminary analysis has listed the following possible attributes but feel free to challenge them and add more:
* For each department: department name (unique), and budget.
* For each employee: employee number (unique), employee name, current project, title, office number, phone number; also, title of each job the employee has held, plus date (starting
* date) and salary for each distinct salary received in that job. For each project: project number (unique), budget, date started, date ended.
* For each office: office number (unique), area in square feet and numbers (unique) of all the phones in that office.

**3 APPLICATION DEVELOPMENT REQUIREMENTS**

The company Best-P would like your help to implement 2 applications: Human Resource management and Project management. Please integrate the data requirement from the application into the database design

**3.1 Human Resources and Payroll**

In addition to the regular employees of the company that are all salaried, the company employs

people for specific projects. These employees are paid hourly, and their employment is limited

to the duration of the project. The company would like an application that help manage all the

employee and pay their salaries every month. For the salaries, we will assume 10% federal tax,

5% state tax and 3% for other taxes and deductions for simplicity. The company keeps the salary and tax history for all the employees as it has to report them to IRS at the end of each year.

**3.2 Project Management**

The project management application will allow:

* Creating a project and assigning the project manager and the project team
* Viewing some statistics on the project (e.g, number of employees working on the project, total person-hours per project).
* The project management application will also help keep track of the project milestones with some details on what has been done and what is left to be done