

Computer Science 631

Database Management Systems Design

Term Project

In this term project, you are asked to design a small database system, create, and populate this database using ORACLE. In the following, you are given the requirements for the database design.

1 GENERAL GUIDELINE

The following guidelines apply for the project:

1. The projects will be done in groups of two. You should form your own groups and update the file on google drive if you have not done it yet.
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.
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) the entity-relationship design, and (c) the (relational) logical database design. For each of these, 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 and the code written for the application.
4. Grading will be done as follows: (a) design report: 40%; (b) database design: 60%. The report must be typed and should be written clearly. The presentation (language and communication of ideas) of the report is very important. Please have it read by someone else before you submit it.
5. In general, each member of a group will be assigned the same grade. However, if I notice that one member of the group is doing all (or most of) the work, I reserve the right to assign differential grades.

2 DATABASE DESIGN REQUIREMENTS

A requirements analysis that was conducted has identified a few requirements about the operations and goals of CS631-MaterialsManagement. You, as the systems analyst/designer,

should feel free to add to these requirements to achieve a richer design. We will assume that the following information results from an interview process with key individuals in the organization:

- The department is responsible for the inventory of three material types: raw material, finished goods, and supplies. Each material, identified by a material ID, belongs to one material type. Each material type classifies many different materials.
- When a raw material or supply is ordered, it is done using a purchase order, where it appears on the purchase order detail. Purchase orders are also used to order capital equipment and services.
- When the materials or supplies ordered on a purchase order arrive or when finished goods are produced, they are a tangible manifestation of the concept of MATERIAL. They are called material lots, and each is assigned a unique identification called a material lot number. For each material, there may be zero, one, or many material lots. Each material lot is the tangible manifestation of one and only one material.
- The entity MATERIAL_LOT includes inventoried raw materials, supplies, and finished goods. These three categories are nonoverlapping and each instance of a material lot must appear in one and only one category.
- A material lot is stored in a warehouse location. A warehouse location may store zero, one, or many material lots. If a material lot is too large to be stored in one warehouse location, it may have to occupy more than one location. A material lot may not be assigned to a warehouse location at some point in time. For example, when raw material is taken from storage and moved to the production area for use in making a finished product, it still exists as a material lot but is not in storage.
- If a material lot is finished goods, it was produced on a production line. A production line can produce more than one material lot of material, and each lot of finished goods will be produced on one and only one production line.
- A production line is made up of one or more pieces of equipment, each with its own equipment ID. Each piece of equipment belongs to one and only one production line.
- Materials may have quality control tests associated with them. This is true of some raw materials and all finished goods. Some raw materials and all supplies are not subject to any quality control tests. Some quality control tests are performed on more than one material, and some materials require more than one quality control test.

This is the end of the requirements report. You are now expected to work on this report to come up with your database design. This requires the development of (a) an entity-relationship model for the conceptual design, and (b) a relational schema design for the logical design. You are also expected to populate this database with some sample data of your own so that you can demonstrate the functionality to your customer.