Personal Database Application

In this project, you will design and implement a database using the ORACLE database management system, languages SQL and Java. It will proceed progressively through conceptual design, logical design, storing (loading) the database, and implementing queries and reports using the facilities of the ORACLE system. Different parts will be due as status reports on the dates to be announced in class. Turn in the status reports to webCT on the announced dates. Projects will be done in groups of two.

The final project report is due by December 2nd, Sunday 11:59pm, when the project reports as well all scripts and code must be turned in to webCT. **No extension will be allowed!** The report includes conceptual and logical designs, code listings, and possible results of executing certain queries. More details will be given in class.

The project will be demonstrated to the instructor in the last week of class - a signup sheet will be posted.

You are encouraged to pick an application to your own interest. Pick something that you have always wanted to do as you will be stuck with the project for more than half of the semester. Instructions for self-picked projects are provided in the next page.

If you cannot think of anything interesting to do, page 3 describes a default project for you to complete.

The following requirements apply to all Personal Database Applications:

- Between now and the final due date, you will be asked to submit several status reports. Failing to turn in one status report will lower your group's project grade by one letter grade, and failing to turn in two will lower your group's project grade by two letter grades. Failing to turn in more than two status reports will lead to an "F" on the project grade for the team.
- * The system must be implemented on ORACLE with Java as the host-language for the application.
- The system must be GUI-based and menu-driven.
- You and your partner will be assessed as a whole team, so both of you will receive the same grade for the project.

* note that the use of other host languages and will also be allowed after instructor's permission.

Instruction for Self-picked Projects

If you choose to develop your own PDA, you would start by writing a description about the project to be submitted to the instructor for approval. The purpose of this report is to evaluate the complexity of the proposed project. The format of the report should follow the default project description, but it does not have to be complete and extensive at the beginning. That means you can modify some system features later in the semester.

Provide the instructor a written report with the following information by **Oct 16 (Tuesday)**:

1. A high level project summary about the main purpose of this PDA project
2. A detailed data requirements of the project.
3. A brief functional requirements of the project.
4. A rough entity-relationship diagram for your proposed database. The detailed ERD will be submitted as the first status report.

There are some basic requirements for your project:

1. Your project must contain at least four different entities
2. Your project must contain at least three different relationships between entity sets
3. Your project must contain at least two different types of users/roles
4. Your project must have at least three different procedures (menu choices), and for the majority of the procedures, there should be at least two non-trivial sub-choices for each procedure.
5. Your project must use stored procedure/triggers, indices

The default project: The Oracle music store

Project Summary

The Oracle music store serves a wide variety of musical interests. As a small store, it must maintain close control of its sale and inventory. The store keeps an inventory of music in stock. The store also keeps track of sales and customer special orders for items out of stock, which are placed through an employee of the store.

Your task is to design the database and application programs that will help manage the inventory and the day to day processing. Note that certain functions like orders with vendors, automatically-generated orders, receipt of shipments, etc. are left out in order to reduce the size of the project.

*** Important!!! The following specifications are intended as a guide; they are NOT the complete, nitty-gritty specifications. These are intended to get you started in the right direction in designing your system. You as the designer must analyze and decide what other details or features should be specified for your system. Thus, individual group implementations will differ in terms of design and implementation styles. Consult with the instructor for if you need any clarification on the specs of this project.

Data Requirements

The Oracle music store sells music in 3 different forms: cassette, compact disk, and sheet music. A given music title has several attributes associated with it: examples are title, artist(s), producer, musical subject, physical type of music (cassette, compact disc, or sheet music), year of recording, etc. An employee can query the music in stock by searching on any one or more attributes of the music.

Music vendors can distribute several music titles; however, each music title can only be distributed by one vendor. Vendor information (name, address, phone, contact person, etc.) is also maintained in the database.

Employees are in charge of several tasks: selling music to customers, place special order from vendors for customers. Employee information is also maintained: ID, name, address, pay level, job title, etc.

The store can place orders to vendors when stock runs low or when a customer requests a special order. A particular order can only go to one vendor: this means that all items being ordered from a particular vendor can exist on the same order. However, if items are distributed by differing vendors, an order form for each vendor must be filled out. Example attributes of orders are the item(s) to be ordered, date of order, vendor to whom the order is going, and customer information if applicable.

Customer information is maintained when special orders are placed for that customer. Customer information can also be maintained optionally when selling music: for example, customers can fill out a card to be put onto a mailing list. ***Note:** Advertising and promotion features are out of the scope of this project.

Sales information must be maintained whenever music items are sold: amount of purchase, each item purchased, customer information (if applicable), the employee making the sale, etc.

Functional Requirements

There are four types of processes that are relevant:

[query] This process allows store employees to query the database with regard to music in stock and music on order.

[order] This process generates special orders by customers for music. A store employee inputs orders.

[sell] This process modifies the database appropriately, regarding the item(s) being sold and the employee making the sale. It is typically the operation done at the cash register. An invoice is generated for every order placed by a customer. A receipt is printed for every in-store sale transaction.

[admin] This process modifies the database information about employees, customers, vendors, etc. It may have other management report features which are left out for this project.

Assumptions (Business rules)

The following assumptions will be made regarding the day-to-day activities of the Oracle Music store. More assumptions may be added at a later date.

Assume that the database is implemented for transactions on or after Jan. 1, 2000.

Music

Music titles can come in 3 different forms: cassette tape, compact disk, or sheet music. At any one time the store may have all three forms in stock for a particular music title. Therefore, the database must keep track of which forms of music are in stock for each music title.

Vendors

A vendor may publish several music titles; however, a particular music title can be published by one and only one vendor.

Special Orders to Vendors

When placing a special order, all music by the same vendor may exist on the same order. Music from different vendors must be placed on different orders: one vendor per order. You can create a unique order ID by using the date as part of the order number. Date should be in the format YYMMDD. Orders is placed by a store employee.

Customers

Customer information is optionally stored in the database. For special orders, recording customer information is mandatory. For in-stock purchases, it is optional.

Employees

Employees of the store will be the users of this database system, not the customers themselves. Information on every employee is in the database for management purposes.

Sales

Each sale is made by one employee for one customer. The sale can include multiple music titles, and should also include quantity & price of each item and a grand total. Upon making the sale, the system should decrement the music in stock appropriately.

Statistics

Sample statistics relevant to the applications include the following. They would impact the real operational environment of the database system. Here, it is offered as general information only.

CUSTOMERS:

3,000 customers in the database

Queries: sales reports are done once weekly by music title

MUSIC:

5,000 different music titles

between 1 and 20 copies of any music title is in stock at any given time

VENDORS:

100 different vendors supply music

CUSTOMER ORDERS/SALES:

50 customer special orders per day are submitted (each order has on average 2 titles)

30 orders are queried per day to check on the status of the order

50 sale transactions per day in the store with an average of 3 titles per sale

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Applications For the Oracle Music Store

You are to develop a menu driven application system for the Oracle Music Store database using Java. The following are examples of some of the menus to be developed. All applications described below MUST be implemented. However, you may choose to add more functions.

*** Note: You may add more menu screens as necessary; the menus below are intended only as a guide.*

Oracle Music - Main Menu

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1. Music Applications

2. Ordering Applications

3. Sales Applications

4. Administrative Applications -- Access restricted to Managers ONLY

5. Exit

Select Item:

For item 1 (Music Applications) in the Main Menu, another menu would appear as shown below, which allows a sales clerk to add a music title to the inventory, change information about any title (based on ISBN) and query the music title information.

Music Applications - Menu

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1. Add A Music Title

2. Query Music Information

3. Return to Main Menu

Select Item:

Each of these items would require further information about the music title to be entered from the user. Adding music requires all parameters of the title to be entered into the database. ***Note:** Changing music information stored in the database is not included for this project. To query music information, the system must prompt the user to enter the desired search criteria and then return the results in a tabular format.

For item 2 (Ordering Applications) in the Main Menu, another menu would appear as shown below, which allows a sales clerk to query the order data (based on order number, customer, or vendor), or place a new order.

Order Applications - Menu

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1. Query Order Information

2. Place New Order

3. Return to Main Menu

Select Item:
Each of these items would require further information about the order from the user. To query an order, the user must enter search criteria, and results of the query must be returned in a tabular format. To place an order, the order information must be prompted for and stored into the database; if the order is for a customer, then customer information must be stored also.

For item 3 (Sales Applications) in the Main Menu, another menu would appear as shown below. The first option allows a clerk to record the information in the database that a given music title(s) has been sold. Appropriate customer information is also stored. The second option produces six sales reports. Note that only managers are allowed to produce sales reports.

Sales Applications - Menu

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1. Sell A Music Title(s)

2. Sales Reports -- Access restricted to Managers ONLY

3. Return to Main Menu

Select Item:

The first choice is continuously used at the cash registers. No customer information is required for a sale. A sale should allow for multiple music titles to be sold during one transaction. A receipt should also be generated.

For item 2, another menu would be produced which would allow the manager to produce five sales reports. Note that the system must have some method of recognizing that the user is a valid manager (use some kind of login method).

Sales Reports - Menu

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1. Sorted total Sales by title

2. Sorted total Sales by vendor

3. Return to Main Menu

Select Item:

All sales reports will prompt the manager to enter starting and ending dates for the report. Depending on which report is chosen, additional information may be needed. All reports should list sales in decreasing order: e.g., the highest sale first.

For item 4 (Administrative Applications) in the Main Menu, another menu would appear as shown below. This menu allows the manager to add/change vendor information, or employee information.

Administrative Applications - Menu

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1. Vendor Information -- Access restricted to Managers ONLY

2. Employee Information -- Access restricted to Managers ONLY

3. Return to Main Menu

Select Item:

Each of these items would require further information. For each choice, the system should ask whether the user wants to add new information or change existing information. To add information, the system should ask for input and store it appropriately. To change information, the system should first display the current information in the database for a particular record, then prompt the user to change the appropriate information, and finally, store the changes.

To access Employee information, managers must provide some sort of clearance (login id and password, for instance).