CS430/630 – Homework 5

Released Apr 17, Due Apr 27

Instructions: The homework is due on Fri, Apr 27th, 11:59pm. Submission is done in electronic format: create a folder HW5 in your course directory and place the source code there. Name your source files Q1.sql, Q2.sql and Q3.sql. Make sure you set the proper permissions for files!

Consider a database schema with three relations:

```
Parts (pid:integer, pname:string, year:integer, price:integer)
Suppliers (sid:integer, sname: string, state:string, zipcode:string)
Orders (pid:integer, sid:integer, quantity:integer)
```

The description is as follows: a factory keeps a database with parts that it uses, the suppliers of those parts, and purchase orders. Each part is uniquely identified by `pid`. Each part has a string description `pname`, `year` of fabrication and `price` per unit. Parts are provided by suppliers, and each supplier is uniquely identified by `sid`. Each supplier has a name `sname`, and it operates at the given `state` and `zipcode`. The company has a number of orders for parts, and each order contains the `pid` of the part ordered, the `sid` of the supplier from which the part is ordered, and the `quantity` ordered. You are allowed flexibility on the exact attribute types you use for your schema, as long as they reasonably match the specification above (e.g., in terms of number types, string types). Include the schema definition in your submission in a file called `schema.sql`.

Question 1 (25 points for 430, 15 points for 630)

Write a PL/SQL function that takes a price as argument and returns the `pid` of the part that has the third-nearest price to the one given. Note that nearest can be either higher or lower. In case there are multiple parts with that property, choose the one with higher `year`. If there is still a tie, choose the one with highest `pid`.

Question 2 (25 points for 430, 15 points for 630)

Write a PL/SQL procedure that receives as arguments `pid`, `sid` and `quantity` of a prospective order. First, you need to determine if the value (i.e., dollar amount) of that order will be lower or equal than 75% of the average previous order value for that part. If the answer is yes, go ahead and input the new order into the database.

Otherwise, compute the `price` value that would make the prospective order value be exactly at the 75% limit above, and then insert a NEW part with that price, and the same attributes as the part given in the `pid` parameter (except for the `pid` of course, for which you need to determine a unique value). Then, input in the database an order with the `sid` and `quantity` given, but for the new `pid`.

Question 3 [630 only] (0 points for 430, 20 points for 630)

Write a PL/SQL module that takes as input a `zipcode` and returns the mean and the variance of order values (i.e., dollar amount) for all orders corresponding to suppliers in that `zipcode`. You are not allowed to use any pre-defined Oracle functions for computing statistics.