USiU-Africa

APT1050A: Database Systems

Spring 2024 Semester Class Project

Issued date: Monday March 25th, 2024

Submission date: Thursday, April 18, 2024

Instructions to the students:

1. You should work in groups of 3s, 2s only or individually
2. This class project is worth 20% of the course Marks.
3. Do not send emails, submit the Class Project using the Blackboard link only.
4. **Note:** The link will close at exactly ***11:59pm.***

Background

Waria-Ki, a Confectionery Manufacturing company has several departments. A department may have many employees but must have at least seven employees. Every employee works for one and only one department. Every department has a manager. Employee's details include, employee number, first name, last name, middle initial, gender, address, hobbies and salary. Department details include department number, department name, location and a phone number. The department number and department name are both unique identifiers of a department. Waria-Ki also tracks dependents of each employee. A dependent must be associated with one and only one employee. Some employees will not have dependents, while others will have many dependents. For all dependents, dependent number, first and last names and gender are recorded. Each employee is assigned an office. Some employees do share offices, but an employee must be allocated an office. Office details include Office number, location and office phone number. Some employees are assigned a company car. The company cars are identified by their vehicle id, and have a license plate number, make, model, and year of manufacture. Waria-Ki manufactures many sugar confectionery products including gum and jelly products, hard sweets, lollipops and Chewables. Each of these products are produced by a particular department. Product details include product number, description, manufacture date and the current price. The products are usually distributed for storage in one or many of the company's warehouses. A warehouse may store one or many type of products. A warehouse details include code, location and phone number. Waria-Ki products are very popular among many kiosk owners. Each kiosk owners can buy any number of products, and each product can be bought by any number of kiosk owners. Kiosk owner's details include code, last name, first name, kiosk location, address and email.

Tasks

(a) Given the information provided on the Waria-Ki background:

i. Draw the fully labelled and implementable Crow's Foot ERD for the requirements provided. Include all the entities, relationships, optionalities and multiplicities.

ii. Translate the ERD that you have developed into a relational schema (Tables). Make sure that you identify all the primary and foreign keys.

iii. Create an Access Control (Authorization) Matrix for the tables in your relational Schema.

(b) Implement your Database design using Oracle SQL*Plus.

i. Use at least one sequence

ii. List of your SQL DDL commands (with the necessary integrity and domain constraints).

iii. Populate the database. Sample of tuples for each relation (for each relation about 3 records).

iv. Try five possible queries and Five sub-queries on the database tables.

(c) Add some advanced features including

i. Create 2 Views (involving two different relations and with different limits to modifications)

ii. Create 2 different procedures

iii. Create 2 different synonyms

iv. Create 2 different triggers

v. Index two of your tables

vi. Allow the user system to use and to allow other users to manipulate records in any of your project tables. He should also allow other users to access your tables.

(d) Create an Application to manage the Waria-Ki data using Oracle APEX

(e) Submit the following on Thursday, April 18, 2024, 11:59pm.

i. *Oracle spool file*

ii. *Your ERD*

iii. *MS-Word Document of your Access Control (Authorization) Matrix*

iv. *Submit the Screen shots of the Waria-Ki APEX application*

v. *Provide the login details to your Oracle Apex Workspace*