UNIVERSITY OF TECHNOLOGY, JAMAICA

FACULTY: Engineering and Computing

SCHOOL: Computing and Information Technology

Module Name: **Database Administration**   Module Code: **CIT3013**

Given: **Week of March 4, 2019**   Due: **Week of April 8, 2019 (Lab Time)**

Assessment Type: **Group Project**   Group Size: 3 - **5**

Objective:

Students are required to develop an Oracle Database Package that integrates with a database application. The package will work as a user management utility that will carry out several DBA functions. The requirements of the utility are listed below.

Method of development:

This project is designed to be completed in a new group environment. Each group should have a 4 – 5 members. **Your lab tutor must approve the group**. Within each group one leader must be assigned. The Leader is responsible for the development of the overall project and the coordination between all parts of the project developed by other members.

Section A - Database Application Requirements

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1. Develop a database application simulating a telecoms environment. The database should be placed in an application schema to which users will be given access. The database should use indexes for frequently queried fields and joins. **(Marks will be deducted if the database is not in Third Normal Form.)** **[25 Marks]**

   Tables:

   - **Customer:** ID Number, Name (First and Last), DOB, Gender, Mobile

   - **Address:** (Address ID, Street Number, Street name, Other Details, Parish, Postal Code)

   - **Mail Type:** (Type Id, Cost per lb, Name,)

   - **Mail: (**ID Number, Sender ID, Recipient ID, Date Received, Date Assigned, Date Delivered, Weight, Mail Type, Status (Waiting, Enroute, Delivered), Cost)

   - **Employee:** TRN, Name (First and Last), DOB, Gender

- Add two other tables and appropriate fields for integration into the proposed database.

2. The database should use a partitioning scheme for your Mail Table by Date Received for the month. The Database should automatically create new partitions. **[10 Marks]**

3. Three roles should be implemented that achieves responsibilities for Viewing, Modification and Administration. Ensure that users have been created to demonstrate each. **[15 Marks]**

4. Stored procedures should be developed for each table in the application that handles ALL DML statements. Insert, Update, Delete procedures should implement time windows for what it determined to be normal hours of operation (Example Monday – Friday 6am – 7pm). Please note that the stored procedure populating the mail table should used the type and the weight referencing the mail type table to calculate the total cost of the delivery. **[20 Marks]**

5. Triggers should be used to implement an audit trail for the table, which holds the most essential data for your application. This should be an update trigger and the past values for that record should be stored. (Any Audit table that is created should have a primary key) **[10 Marks]**

6. Tracking Logons from Various Locations - The database should be able to track and identify when a username as has connected to the database from different machines. For security purposes the utility should be able to identify the username, operating system user name, machine from where the user is logged on and how long they are logged on. Custom tables will need to be designed and implemented for this requirement. **[15 Marks]**

7. Develop an application that connects to the Oracle Database Application you created. The application does not have to be fully functional. The application should at a minimum use ALL DML stored procedures to interact with your main table. (A special user account should be setup for this access) **[10 Marks]**

8. Implement a fine grain auditing policy that tracks persons searching for mail delivered over $20,000. Additional demonstrate that the audit was recorded. **[10 Marks]**

9. Implement a view for security demonstrating a user having modification privileges can use this. **[7 Marks]**

Section B - Package Requirements:

1. Managing Users **[10 Marks]**

   a. Creating Single User – The utility should be able to accept a user name and role for which the following will be done. (The role must be one that was implemented for the database in Section A)

   - Give a default Table Space
   - Give a 1 Megabyte Quota
   - Password word of Pass1234, which the user can change upon log on.

   b. Creating A Set of Users - Using the rules in requirements 1a users should be created from reading usernames and roles from a flat file.

   c. Deleting a User (by accepting a username)

   d. Deleting a set of Users (by accepting a flat file with usernames only)

2. Exporting Data – The Utility should have a procedure that will be able to accept a schema and table name and produce a flat file for that table where the user can chose any of the file formats for the export CSV, XML or JSON. **[20 Marks]**

3. Managing Locked Accounts – The utility should be able to identify each locked account that was locked because of invalid login attempts. The utility should further unlock accounts that have been locked for more than a week. **[15 Marks]**

4. The utility should have a procedure that creates records in the mail table to simulates packages being delivered. The procedure should accept a start date and an end date for the simulation along with how many deliveries you want to simulate. The data from the other tables should be used when populating the mail table (Eg. Randomly picking client as receivers and senders, to an address and delivered by a mail man from the employee table). **[20 Marks]**

Section C – Submission Rules and Requirements:

1. Projects are due in the Lab Time of the group Leader.

2. The project must have a project document outlining the scenario of the project and the ERD diagram that will be used in the Application Schema. The project document should further have a detailed paragraph for each task explaining what your implementation of the task in trying to accomplish along with an explanation of any decisions taken **(Eg. Which partitioning method you chose and why for your specific scenario. You should highlight why others techniques were not chosen.)** The project document should include the statements use to implement each task. Marks will only be given for tasks that are commented properly. An example of the execution statement should also be included.

3. Each Group must have a task list with who is responsible for which aspect of the Project.

4. Marks will not be awarded for section B if there is no Oracle Package Present.

5. **Each group must submit the project in a compressed file via email by the due date as stated above.**

6. If the project is submitted to lecturer after the due day the evaluation interview will still be conducted, but a penalty is attracted for every late day. **Each day after due day (including Saturdays and Sundays) will attract a 10% accumulative penalty which will be deducted from the total mark of project. No Project will be accepted one week after the due data has passed.**

7. Presentation of the final project will be based on "face to face" discussion individually with each member of group.

8. If the presentation time is missed, a written letter must be provided outlining the reasons for missing the appointed time along with a request for another presentation time.

9. Each member of the group should be responsible for a task of project.

10. It is not acceptable for a student to know only their part of project and have no knowledge about other parts or how their part integrates with the project.