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| **Midterm Exam 20221**  **STT**  Subject: IT3290E – DatabaseLab Group: 2  Date: Feb 8, 2023 Duration : 45 **min** | |
| Student ID:  Student Name: | **Note:** |

**For each question, paste your code and a screenshot of the output of each question**

Question 1: (Index)

1. Write SQL query to return a list of products in category number 3
2. Write SQL sentence to create a hash index on “products.category” and show the query plan for query (a) generated by DBMS
3. Write SQL query to return a list of products in category number greater than 3 and show the query plan for query (a) generated by DBMS
4. Write SQL sentence to create a btree index on “products.category” and show the query plan for query (c) generated by DBMS
5. Is there any difference between the query plans generated in c and d ? Explain

Question 2: (Query)

* 1. Drop all index (except the ones related to the primary keys)
  2. Write SQL all possible queries (join, nested queries, …. ) to return a list of different products in “Documentary” category which does not appeared in any orders.
  3. Compare the query plans generated by DBMS for the above queries. Are they different? Explain
  4. Create relevant index(es) (one by one) for the above queries and check if index is used. Explain

Question 3 (Trigger)

1. Add the attributes “orders\_value” in the relation Customers. “orders\_value” is the total value of all customer’s orders
2. Write trigger to ensure that the attribute “orders\_value” must be updated automatically according to any change (insert/update/delete) of customer’s orders.

Question 4: (function)

Write a function to return the range of a customer indicated by customerid (as input argument). The range of a customer is

* + - “titan” if the total value of his/her orders is greater or equal to 50.000.000 or the value of an order is greater than 20.000.000
    - “gold” if the total value of his/her orders is greater or equal to 30.000.000 or the value of an order is greater than 15.000.000
    - “silver” for all other cases