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| **Midterm Exam 20221**  **STT**  Subject: IT3290E – DatabaseLab Group: 3  Date: Feb 9, 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 customer in US (country)
2. Write SQL sentence to create a hash index on “customers.country” and show the query plan for query (a) generated by DBMS
3. Write SQL sentence to create a btree index on “customers.country” and show the query plan for query (a) generated by DBMS
4. Is there any difference between the query plans generated in b and c ? Explain
5. Drop all the index created in (b) and (c). Write SQL query to return a list of customer in France (country) and then redo b,c,d for the new query.
6. Is there any difference between d and e ? Explain

Question 2: (Query)

* 1. Write SQL all possible queries (join, nested queries, …. ) to return a list of different customers in “Canada” who have already orders somethings
  2. Drop all index (except the ones related to the primary keys) in the relations in query (a). Show the query plans generated by DBMS for each above queries. Are they different? Explain
  3. 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 “total\_sold” in the relation Products. “total\_sold” is the total of number of products in all orders
2. Write trigger to ensure that the attribute “total\_sold” must be updated automatically according to any change (insert/update/delete) of orders related to the product

Question 4: (function)

Write a function to return the range of a products indicated by product id (as input argument). The range of a product is

* + - “trending” if the total number (total\_sold) of sold is greater than 30
    - “potential” if the total number of sold is between 20 and 30
    - “new” for other cases

Before returning the range of the product, we must check if total\_sold is correct (see question 3(a)). If it is not correct, the total sold must be updated.