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IST 302
Spring 2017 Computer Exercise 3 (CE3)
Due Date: 03/06/2017

Create copies of the IST302.PROMOTIONS, IST302.CUSTOMERS, IST302.CHANNELS, IST302.TIMES tables in your schema as MY_PROMOTIONS, MY_CUSTOMERS, MY_CHANNELS, MY_TIMES. You do not need to calculate storage for these tables.

Question 3.1: Query Catalog Tables

- a) Run a query that accesses the USER_TABLES catalog table and reports the AVG_ROW_LEN, NUM_ROWS values for the MY_PROMOTIONS table.
- b) Execute the statement “ANALYZE TABLE MY_PROMOTIONS COMPUTE STATISTICS” and then rerun the query of part (a). Is there any difference in the results of both queries? Please provide an explanation.

Question 3.2: Execution Plans

Use the EXPLAIN PLAN facility to generate the execution plans for each query described in the table below. Interpret each execution plan.

- o You should first analyze table then generate the execution plans.
- o You should try to generate at least 4 execution plans (see below) for each query then select the ‘best’ plan based on the cost.
- o Plan Type 1: Indexes should be available on the Join columns only
- o Plan Type 2: Individual indexes on all select (σ) columns should also be available plus those above
- o Plan Type 3: Use index hint on one of the indexes that you think the query optimizer should use. Check Oracle index hint syntax [here](#).
- o Plan Type 4: A composite index on CUST_GENDER & CUST_MARITAL_STATUS should also be available plus those above

Label	Description
Q3.2a	<pre> SELECT CUST_LAST_NAME ', ' CUST_FIRST_NAME AS CUST_NAME, FISCAL_MONTH_NAME, S.TIME_ID AS SALES_DATE, CHANNEL_DESC, PROMO_NAME, PROD_SUBCATEGORY, PROD_NAME, AMOUNT_SOLD FROM MY_SALES S, MY_CUSTOMERS C, MY_PRODUCTS_CE2 P, MY_PROMOTIONS R, MY_CHANNELS H, MY_TIMES T WHERE S.CUST_ID = C.CUST_ID AND S.PROD_ID = P.PROD_ID AND S.PROMO_ID = R.PROMO_ID AND S.CHANNEL_ID = H.CHANNEL_ID AND S.TIME_ID = T.TIME_ID AND CUST_GENDER = 'M' AND CUST_MARITAL_STATUS = 'Married' AND FISCAL_MONTH_NAME IN ('February', 'March', 'April', 'May', 'June') AND PROD_SUBCATEGORY IN ('Monitors', 'Recordable CDs') AND CHANNEL_DESC = 'Tele Sales' AND S.TIME_ID BETWEEN '02-25-1998' AND '01-30-2000'; </pre>

Q3.2b	<pre> SELECT CUST_LAST_NAME ', ' CUST_FIRST_NAME AS CUST_NAME FROM MY_SALES S, MY_CUSTOMERS C, MY_PRODUCTS_CE2 P WHERE S.CUST_ID = C.CUST_ID AND S.PROD_ID = P.PROD_ID AND CUST_GENDER = 'M' AND CUST_MARITAL_STATUS = 'Married' AND PROD_SUBCATEGORY IN ('Monitors', 'Recordable CDs') MINUS SELECT CUST_LAST_NAME ', ' CUST_FIRST_NAME AS CUST_NAME FROM MY_SALES S, MY_CUSTOMERS C, MY_PROMOTIONS R, MY_CHANNELS H, MY_TIMES T WHERE S.CUST_ID = C.CUST_ID AND S.PROMO_ID = R.PROMO_ID AND S.CHANNEL_ID = H.CHANNEL_ID AND S.TIME_ID = T.TIME_ID AND FISCAL_MONTH_NAME IN ('February', 'March', 'April', 'May', 'June') AND CHANNEL_DESC = 'Direct Sales' AND S.TIME_ID BETWEEN '02-25-1998' AND '01-30-2000'; </pre>
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Q3.2c	<pre> SELECT CUST_GENDER AS GENDER, PROD_SUBCATEGORY, FISCAL_MONTH_NAME, TO_CHAR(S.TIME_ID, 'MONTH') AS SALES_MONTH, CHANNEL_CLASS, SUM(AMOUNT_SOLD) AS TOTAL_AMOUNT_SOLD FROM MY_SALES S, MY_CUSTOMERS C, MY_PRODUCTS_CE2 P, MY_PROMOTIONS R, MY_CHANNELS H, MY_TIMES T WHERE S.CUST_ID = C.CUST_ID AND S.PROD_ID = P.PROD_ID AND S.PROMO_ID = R.PROMO_ID AND S.CHANNEL_ID = H.CHANNEL_ID AND S.TIME_ID = T.TIME_ID AND CUST_GENDER = 'M' AND CUST_MARITAL_STATUS = 'Married' AND FISCAL_MONTH_NAME IN ('February', 'March', 'April', 'May', 'June') AND PROD_SUBCATEGORY IN ('Monitors', 'Recordable CDs') AND S.TIME_ID BETWEEN '02-25-1998' AND '01-30-2000' GROUP BY CUST_GENDER, PROD_SUBCATEGORY, FISCAL_MONTH_NAME, TO_CHAR(S.TIME_ID, 'MONTH'), CHANNEL_CLASS; </pre>
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Appendix 3.1: Query Execution Plan Report

Table 1: Plan Cost Report

Query	Plan 1 (index on ID fields)	Plan 2 (plus (σ) columns)	Plan 3 (using hint)	Plan 4 (plus composite index)	Best Plan #
	Cost	Cost	Cost	Cost	
Query 3.2 a					
Query 3.2 b					
Query 3.2 c					

Table 2: Query 3.2 a Query Execution Plan

Query Execution Plan Output	
Plan 1	
Plan 2	
Plan 3	
Plan 4	
Best Plan Explanation	Describe the steps in the ‘best’ execution plan; indicated whether each table is read completely or randomly; for each randomly accessed table, indicate selected index

Table 3: Query 3.2 b Query Execution Plan

Query Execution Plan Output	
Plan 1	
Plan 2	
Plan 3	
Plan 4	
Best Plan Explanation	Describe the steps in the ‘best’ execution plan; indicated whether each table is read completely or randomly; for each randomly accessed table, indicate selected index

Table 4: Query 3.2 c Query Execution Plan

Query Execution Plan Output	
Plan 1	
Plan 2	
Plan 3	
Plan 4	
Best Plan Explanation	Describe the steps in the ‘best’ execution plan; indicated whether each table is read completely or randomly; for each randomly accessed table, indicate selected index

Appendix 3.2: CE3 Grade Form

Student:

Ques	Comments	Score	
		Actual	Perfect
3.1a	<input type="checkbox"/> Evidence of Successful Query Execution not displayed		2
3.1b	<input type="checkbox"/> Evidence of Successful Analyze Execution not displayed <input type="checkbox"/> Evidence of Successful Query Execution not displayed <input type="checkbox"/> No or Inadequate Explanation provided		6
3.2	<input type="checkbox"/> Did not Analyze each Table – No Evidence displayed <input type="checkbox"/> Did not create indexes for each σ column – No Evidence displayed <input type="checkbox"/> Did not create indexes for each JOIN column – No Evidence displayed <input type="checkbox"/> Did not create of one or more composite index – No Evidence displayed <input type="checkbox"/> Did not Analyze each index - No Evidence displayed		10
3.2a	<input type="checkbox"/> Not Done <input type="checkbox"/> Evidence of Execution Plan(s) generation not displayed <input type="checkbox"/> Did not generate multiple execution plans (e.g. with, without hints) <input type="checkbox"/> Entire Cost for each query execution plan not displayed <input type="checkbox"/> Did not Correctly identify the 'best' of the generated plans <input type="checkbox"/> Did not describe the steps in the 'best' execution plan <input type="checkbox"/> Did not indicated whether each table is read completely or randomly. <input type="checkbox"/> For each randomly accessed table, did not indicate selected index		16
3.2b	<input type="checkbox"/> Not Done <input type="checkbox"/> Evidence of Execution Plan(s) generation not displayed <input type="checkbox"/> Did not generate multiple execution plans (e.g. with, without hints) <input type="checkbox"/> Entire Cost for each query execution plan not displayed <input type="checkbox"/> Did not Correctly identify the 'best' of the generated plans <input type="checkbox"/> Did not describe the steps in the 'best' execution plan <input type="checkbox"/> Did not indicated whether each table is read completely or randomly. <input type="checkbox"/> For each randomly accessed table, did not indicate selected index		16
3.2c	<input type="checkbox"/> Not Done <input type="checkbox"/> Evidence of Execution Plan(s) generation not displayed <input type="checkbox"/> Did not generate multiple execution plans (e.g. with, without hints) <input type="checkbox"/> Entire Cost for each query execution plan not displayed <input type="checkbox"/> Did not Correctly identify the 'best' of the generated plans <input type="checkbox"/> Did not describe the steps in the 'best' execution plan <input type="checkbox"/> Did not indicated whether each table is read completely or randomly. <input type="checkbox"/> For each randomly accessed table, did not indicate selected index		16
	*** TOTAL ***		66



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