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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 ( $\sigma$ ) 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> <b>SELECT</b>     CUST_LAST_NAME  ', '  CUST_FIRST_NAME AS CUST_NAME <b>FROM</b>     MY_SALES S, MY_CUSTOMERS C, MY_PRODUCTS_CE2 P <b>WHERE</b>     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') <b>MINUS</b> <b>SELECT</b>     CUST_LAST_NAME  ', '  CUST_FIRST_NAME AS CUST_NAME <b>FROM</b>     MY_SALES S, MY_CUSTOMERS C, MY_PROMOTIONS R, MY_CHANNELS H,     MY_TIMES T <b>WHERE</b>     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> <b>SELECT</b>     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 <b>FROM</b>     MY_SALES S, MY_CUSTOMERS C, MY_PRODUCTS_CE2 P, MY_PROMOTIONS     R, MY_CHANNELS H, MY_TIMES T <b>WHERE</b>     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' <b>GROUP BY</b>     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 ( $\sigma$ ) 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 $\sigma$ 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
	<b>*** TOTAL ***</b>		<b>66</b>



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