**Project 1: Writing SQL Queries Using Oracle's SQL\*Plus**

The following six tables will be used for this project. These tables are either directly from or modified from the relations obtained in Homework 3.

* Employees(eid, name, telephone#, email)
* Customers(cid, first\_name, last\_name, phone#, visits\_made, last\_visit\_date)
* Products(pid, name, qoh, qoh\_threshold, orig\_price, discnt\_category)
* Prod\_Discnt(discnt\_category, discnt\_rate)
* Purchases(pur#, eid, pid, cid, pur\_time, quantity, unit\_price, payment, saving)

The meaning of each attribute is the same as that in the Requirements Document for RBMS.

The SQL statements for creating and populating these tables are provided in the file RBMSTablesScript.txt, which is uploaded to Brightspace. Brightspace also has instructions to use this file. This project is based on the tables created by the SQL statements in RBMSTablesScript23.txt. **No changes are allowed to these tables for this project.**

After you transfer RBMSTablesScript23.txt to your harveyv account, rename it to RBMSTablesScript23.sql by

$mv RBMSTablesScript23.txt RBMSTablesScript23.sql

Then log into your Oracle account and create the tables needed for this project by

SQL> start RBMSTablesScript23

I suggest that you first test each query individually and save each query in a different file (with extension .sql) in your harveyv account (e.g., SQL> save query1). After all queries have been tested to your satisfaction and saved, you can run all the queries in a sequence and save the entire session in a spool file. Suppose you have saved your queries in files query1.sql, ..., query20.sql. Follow the steps below to generate the spool file after you have logged into your Oracle account.

SQL> set echo on

SQL> spool project1.txt

SQL> start query1

.......

SQL> start query20

SQL> spool off

The following are the 20 statements for this project:

1. Find the pid and name of each product that has a discount rate between 10% and 20% (i.e., including 10% and 20%) and can still sell 5 without the need to restock (i.e., (qoh – 5) >= qoh\_threshold).
2. Find the name of each customer who visited the retail business in October 2022 and whose phone# has an area code 666. The name is a concatenation of the first\_name and the last\_name. You can use to\_char(pur\_time, 'Month') and to\_char(pur\_time, 'YYYY') to extract month (e.g., October) and year (e.g., 2022) from pur\_time, respectively.
3. Find the first\_name and phone# of each customer who has made at least one purchase with a total price (i.e., payment) of at least 100 dollars in October 2022.
4. Find the pid and name of each product that is priced below 10 dollars (based on unit\_price) and is purchased in August 2022 or September 2022.
5. Find the pur# of each purchase where a customer whose first name starts with “K” purchased a product whose original price is lower than 15 from an employee whose telephone’s area code is 888.
6. Find the pur#, product name (with header “product name”), pur\_time, payment and saving of each purchase. pur\_time must be displayed in a format as illustrated by the following example: March 10, 2023 Friday and the column is displayed as pur\_date.
7. Find the eid and name of each employee who has not sold any products, i.e., not involved in any purchases. Write two queries for this statement with one having an uncorrelated subquery and another one having a correlated subquery.
8. Find the discount categories and their corresponding discount rates that have not been used on any product.
9. Find the name (i.e., the concatenation of the first name and last name) of each customer who has visited the retail business multiple times (i.e., more than once) but has not visited the business (i.e., has not made any purchase) in the most recent 100 days.
10. Find the eid and name of each employee who has sold all the products that have discount category 3.
11. Find the pid and name of each product that has an original price over $180 and has been sold by all employees whose name starts with either an A or a D.
12. Find the cid of each customer who visited the retail business in August 2022 and has purchased all the products whose original price is between $15 and $20 (consider all purchases made by the customer, not just those made in August 2022).
13. Find the cid and name (i.e., the concatenation of the first name and last name) of each customer who has made at least one purchase that has the highest payment among all individual purchases. Note that it is possible for multiple purchases to have the same highest payment.
14. Find the pid and name of the product that has the highest discount per item in terms of absolute dollar amount (not necessarily the highest discnt\_rate). Also show this dollar amount (header: “discount amount”). It is possible that multiple products have the same highest discount amount. Use column format to change the header to “discount amount” (SQL> column discnt\_amount heading "discount amount").
15. For each month in chronological order (header: “Month”), output the total sale (header: “Total Sale”) of the month (which is the sum of all payment for the month). Under “Month”, show both month and year in the format as illustrated by “2022/08” for August 2022.
16. Find the cid and first name of each customer as well as the number of different types of products (i.e., products with different pids) that have been purchased by the customer.
17. Find the cid and name (i.e., the concatenation of the first name and last name) of each customer who has visited the retail business more times than all customers whose phone# has an area code 777. Write an SQL query for this question without using any aggregate function.
18. Find the pid and name of each product that has been sold the most in terms of the total quantity. Also display the corresponding total quantity (header: “total quantity sold”). Note that it is possible that more than one product has been sold the same (highest) total quantity.
19. Find the cids and first names of the top-4 customers who have spent the most amounts of money at the retail business. Also show the total amount of money spent (header: “total amount spent”) by each of these customers. If more than one customer is tied at the fourth place, showing anyone (just one) of them is acceptable.
20. Find the pid and name of the product that has not sold for the longest time (in number of days) among the products that have been sold before.