

# CS561 – Programming Assignment 1

**Due Dates: 3/28/2022 (Mon.) for Sec. A & 3/31/2022 (Thu.) for Sec. B**

## Objectives

In this assignment, you will express “complex” OLAP queries in SQL. The key point of the exercise is to observe the complexity of expressing the type of such queries despite relatively simple ideas of the queries themselves. Your mission (in addition to writing the SQL queries) is to consider the reasons for the complexity of the *expression* of these queries.

## Description

Generate 5 separate reports based on the following queries (one report for query #1, one for query #2, one for query #3, one for query #4 and another for query #5):

- For each *customer*, compute the minimum and maximum sales quantities along with the corresponding products (purchased), dates (i.e., dates of those minimum and maximum sales quantities) and the states in which the sale transactions took place. If there are >1 occurrences of the min or max, display all.  
  
For the same *customer*, compute the average sales quantity.
- For each *year* and *month* combination, find the “slowest” and “busiest” days (those days with the least and the most total sales quantities of products sold) and the corresponding total sales quantities (i.e., SUMs).
- For each *customer* and *month*, find the “most favorite” product (the product that the customer purchased the most for the given month) and the “least favorite” product (the product that the customer purchased the least for the given month).
- For each *customer* and *product* combination, show the average sales quantities for the four quarters (of the year), Q1, Q2, Q3 and Q4 in four separate columns – Q1 being the first 3 months of the year (i.e., January, February and March), and so on – ignore the YEAR component of the dates (i.e., 10/25/2016 is considered the same date as 10/25/2017, etc.). Additionally, compute the average for the “whole” year (again ignoring the YEAR component, meaning simply compute AVG) along with the total quantities (SUM) and the counts (COUNT).
- For each *product*, output the maximum sales quantities for each quarter in 4 separate columns. Like the first report, display the corresponding dates (i.e., dates of those corresponding maximum sales quantities). Ignore the YEAR component of the dates (i.e., 10/25/2016 is considered the same date as 10/25/2017, etc.).

The following is a sample output – quantities displayed are for illustration only (not the actual values). **For dates (e.g., MAX DATE, MIN DATE), you can display (1) ‘month’, ‘day’ and ‘year’ as 3 separate columns or (2) concatenate them into MM/DD/YYYY format and display or (3) simply use the ‘date’ column (in YYYY-MM-DD format).**

### Report #1:

CUSTOMER	MIN_Q	MIN_PROD	MIN_DATE	ST	MAX_Q	MAX_PROD	MAX_DATE	ST	AVG_Q
=====	=====	=====	=====	==	=====	=====	=====	==	=====
Claire	12	Pepsi	01/01/2016	NJ	93	Apple	09/25/2020	NY	435
Sam	1	Milk	02/15/2019	NJ	259	Banana	03/23/2017	CT	56
Emily	2	Bread	07/01/2020	NY	87	Milk	02/02/2020	NJ	512

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**Report #2:**

YEAR	MONTH	SLOWEST_DAY	SLOWEST_TOTAL_Q	BUSIEST_DAY	BUSIEST_TOTAL_Q
=====	=====	=====	=====	=====	=====
2016	12	31	7555	15	912382
2016	2	7	10708	18	2058236
2017	7	5	15734	1	90382
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2019	8	26	7089	28	1274101
2020	12	23	734	25	2846023
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**Report #3:**

CUSTOMER	MONTH	MOST_FAV_PROD	LEAST_FAV_PROD
=====	=====	=====	=====
Boo	9	Fish	Apple
Chae	3	Dates	Butter
Mia	12	Ham	Jellies
. . . . .			

**Report #4:**

CUSTOMER	PRODUCT	Q1_AVG	Q2_AVG	Q3_AVG	Q4_AVG	AVERAGE	TOTAL	COUNT
=====	=====	=====	=====	=====	=====	=====	=====	=====
Dan	Ice	149	998	383	25	488	6344	13
Wally	Fish	39	72	142	35	79	632	8
Helen	Butter	43	981	239	87	281	2529	9
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**Report #5:**

PRODUCT	Q1_MAX	DATE	Q2_MAX	DATE	Q3_MAX	DATE	Q4_MAX	DATE
=====	=====	=====	=====	=====	=====	=====	=====	=====
Apple	879	01/11/2017	609	04/24/2018	523	07/03/2019	964	10/14/2019
Grapes	792	03/31/2020	982	05/14/2020	881	08/23/2017	369	12/31/2020
Cherry	345	02/22/2019	659	03/10/2015	288	09/11/2016	261	11/15/2015
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**Grading**

**NOTE: A query with syntax errors will lose 50% of the points for the query.**

**Submission**

Submit **one file** containing all the 5 queries on Canvas – Please include your name and CWID in the file. The file type must be “TXT”.

Please include a “README” file if any special instructions are required.

You can discuss the “ideas” with your classmates or your friends, but the final queries must be your own work. If I determine that your queries are copies of someone else’s, both you and that someone else will be disciplined (you will receive 0 for the entire assignment) and possibly receive additional penalties for the course.