

## CS 562 – Programming Exercise

To complete by: 03/02/2022 (Fri.)

>>> Not to be graded <<<

### Objectives:

- To become familiar with the concept of *Ad-Hoc OLAP Query Processing* using a DBMS (e.g., PostgreSQL) in preparation for the main project.

### Description:

"Simple Database Application Program" (sdap.cpp)

This assignment has 2 parts – write 2 separate programs to process 2 ad-hoc OLAP queries: the first one is for a simple "Pivoting" query and the second is for a "Dependent" query:

- "Pivoting"**: For 2017, find for each customer the average sale in "NY", the average sale in "CT" and the average sale in "NJ", if New York's average is greater than the other two. Refer to the example query #1 in the power point slides, "Ad-hoc OLAP Query Processing".
- "Dependent Aggregation"**: For each product count for each month of 2017 the sales that were at least 25% greater than the previous or the following month's average sale (i.e., adjacent months). This query is similar to the example query #4 in the power point slides, "Ad-hoc OLAP Query Processing".

For this assignment, you can either write 2 separate programs, one for each of the 2 reports, or one program with a menu allowing the user to select the report type.

Note that the query #1 can be processed in a single scan, whereas the query #2 will require at least 2 scans.

The following are sample report output:

#### Query #1:

CUST	AVG_NY	AVG_CT	AVG_NJ
=====	=====	=====	=====
Bloom	28923	43241	31873
Sam	4239	9872	2142

. . . .

#### Query #2:

PRODUCT	MONTH	COUNT
=====	=====	=====
Bread	1	<NULL>
Bread	2	1242
Bread	3	987
. . . .		
Bread	12	<NULL>
. . . .		
. . . .		
Milk	1	<NULL>
Milk	2	763
Milk	3	132

Make sure that:

1. The input data ("sales") is in a DBMS table (e.g., PostgreSQL – as opposed to a text file). I'll provide the data and the corresponding schema, and you will create the table and load the data into the table.
2. Character string data (e.g., customer name and product name) are left justified.
3. Numeric data (e.g., Maximum/minimum Sales Quantities) are right justified.
4. The Date fields are in the format of MM/DD/YYYY (i.e., 01/02/2020 instead of 1/1/2020).

**Sample  
Command  
Line**

```
$ sdap sales
```