## CS246: Database Management Systems Lab

Lab # 13 (1 Questions, 55 Points)

Held on 17-Apr-2023

Lab Timings: 14:00 to 18:00 Hours Pages: 3

Submission: 18:00 Hrs, 17-Apr-2023

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- a. This lab assignment is based on the concepts covered in chapter 5 Advanced SQL in the CS245 theory class.
- b. You can refer to the text book for SQL syntax.

Question 1: (55 points)

Pivot tables and OLAP functions Using MySQL perform the following tasks:

Task 01 (1 mark) Create a database named week13

Task 02 (3 marks) Create tables

a. A location table containing the following

| $1^{st}$ column | $location\_id$ | integer                               |
|-----------------|----------------|---------------------------------------|
| $2^{nd}$ column | city           | string of characters of fixed size 10 |
| $3^{rd}$ column | state          | string of characters of fixed size 2  |
| $4^{th}$ column | country        | string of characters of fixed size 20 |

with location\_id as primary key.

b. A product table containing the following

|                 | _               | _                                     |
|-----------------|-----------------|---------------------------------------|
| $1^{st}$ column | product_id      | integer                               |
| $2^{nd}$ column | $product\_name$ | string of characters of fixed size 10 |
| $3^{rd}$ column | category        | string of characters of fixed size 2  |
| $4^{th}$ column | price           | integer                               |

with product\_id as primary key.

c. A sale table containing the following

| $1^{st}$ column | product_id     | integer |
|-----------------|----------------|---------|
| $2^{nd}$ column | $time\_id$     | integer |
| $3^{rd}$ column | $location\_id$ | integer |
| $4^{th}$ column | sales          | integer |

with product\_id, time\_id, location\_id as primary key.

## Task 03 (3 marks) populate data

- a. Populate data from file location.csv into table location
- b. Populate data from file product.csv into table product
- c. Populate data from file sale.csv into table sale

Task 04 (48 marks) Building a pivot table

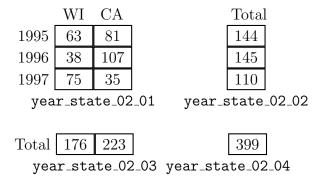
|       | WI  | CA  | Total |
|-------|-----|-----|-------|
| 1995  | 63  | 81  | 144   |
| 1996  | 38  | 107 | 145   |
| 1997  | 75  | 35  | 110   |
| Total | 176 | 223 | 399   |

year\_state\_01

- a. (12 marks) Construct a pivot table year\_state\_01 method 01
  - Whose columns are states WI, CA, total
  - Whose rows are years 1995, 1996, 1997, total

by writing the following individual queries to construct the pivot table

- i. Compute the total sales for the state WI in the year 1995
- ii. Compute the total sales for the state CA in the year 1995
- iii. Compute the total sales in the year 1995 for the states (WI, CA)
- iv. Compute the total sales for the state WI in the year 1996
- v. Compute the total sales for the state CA in the year 1996
- vi. Compute the total sales in the year 1996 for the states (WI, CA)
- vii. Compute the total sales for the state WI in the year 1997
- viii. Compute the total sales for the state CA in the year 1997
  - ix. Compute the total sales in the year 1997 for the states (WI, CA)
  - x. Compute the total sales for the states WI in the years (1995, 1996, 1997)
  - xi. Compute the total sales for the states CA in the years (1995, 1996, 1997)
- xii. Compute the total sales for the states (WI, CA) in the years (1995, 1996, 1997)
- xiii. The result of all the above queries should be a year\_state pivot table
- b. (12 marks) Construct a pivot table year\_state\_02 method 02



- i. (3 marks) Write a single query using sale, location tables to generate year\_state\_02\_01
- ii. (3 marks) Write a single query using year\_state\_02\_01 table to generate year\_state\_02\_02
- iii. (3 marks) Write a single query using year\_state\_02\_01 table to generate year\_state\_02\_03

- iv. (3 marks) Write a single query using either year\_state\_02\_02 or year\_state\_02\_03 to generate year\_state\_02\_04
- c. (12 marks) Construct a pivot table year\_state\_03 method 03
  - Compute the pivot table through a **single query**.
  - Hint 1: The query would involve group by over year
  - Hint 2: For each column of the pivot table, use case statement and sum aggregation function
- d. (12 marks) Construct a pivot table year\_state\_04 method 04
  - (12 marks) Compute the pivot table through rollup operation

**Instructions** Adhere to the following

**SQL** statements Write the SQL statements corresponding to each task in a text.

File naming text file name should be [Your roll number].sql

**Independent efforts** You should make an honest and independent effort in obtaining the solution to the above problem.

Mobile phones are not allowed inside the lab

**Submission Procedure** You should upload all the SQL files and python script files in MS assignments site.

Marking Scheme Mentioned against each task/sub task