

## CSE 512 Assignment 2

### Maximum Points Possible - 5

The required task is to build a simplified query processor that accesses data from the partitioned ratings table.

**Input Data:** - Same as in Assignment 1 i.e. ratings.dat file.

**Required Task:** - Below are the steps you need to follow to fulfill this assignment:

**RangeQuery()** –

- Implement a Python function *RangeQuery* that takes as input: (1) *Ratings* table stored in PostgreSQL, (2) *RatingMinValue* (3) *RatingMaxValue* (4) *openconnection*
- Please note that the *RangeQuery* would not use ratings table but it would use the range and round robin partitions of the ratings table.
- *RangeQuery()* then returns all tuples for which the *rating* value is larger than or equal to *RatingMinValue* and less than or equal to *RatingMaxValue*.
- The returned tuples should be stored in a text file, named ***RangeQueryOut.txt*** (in the same directory where Assignment2\_Interface.py is present) such that each line represents a tuple that has the following format such that *PartitionName* represents the full name of the partition i.e. *RangeRatingsPart1* or *RoundRobinRatingsPart4* etc. in which this tuple resides.

***PartitionName, UserID, MovieID, Rating***

Example:

***RangeRatingsPart0,1,377,0.5***  
***RoundRobinRatingsPart1,1,377,0.5***

- Note: Please use ‘,’ (COMMA, no space character) as delimiter between *PartitionName*, *UserID*, *MovieID* and *Rating*.

**PointQuery()** –

- Implement a Python function *PointQuery* that takes as input: (1) *Ratings* table stored in PostgreSQL, (2) *RatingValue*. (3) *openconnection*
- Please note that the *PointQuery* would not use ratings table but it would use the range and round robin partitions of the ratings table.
- *PointQuery()* then returns all tuples for which the *rating* value is equal to *RatingValue*.
- The returned tuples should be stored in a text file, named ***PointQueryOut.txt*** (in the same directory where Assignment2\_Interface.py is present) such that each line represents a tuple that has the following format such that *PartitionName* represents the full name of the partition i.e. *RangeRatingsPart1* or *RoundRobinRatingsPart4* etc. in which this tuple resides.

***PartitionName, UserID, MovieID, Rating***

Example

***RangeRatingsPart3,23,459,3.5***  
***RoundRobinRatingsPart4,31,221,0***

- Note: Please use ‘,’ (COMMA) as delimiter between *PartitionName*, *UserID*, *MovieID* and *Rating*.

Please use the **function signature exactly same as mentioned in Assignment2\_Interface.py**.

**Naming Convention to be followed strictly:**

Database name –*ddsassignment2*

Name of Rating table –*ratings*

Postgres User name –*postgres*

Postgres password –*1234*

Name of the Range Query Output file –*RangeQueryOut.txt*

Name of the Point Query Output file –*PointQueryOut.txt*

**How to use tester.py:**

Open the Assignment2.zip file and dump all the contents in a folder.

Also move *ratings.dat* file to this folder.

As per the naming conventions provided above, setup your postgresql.

Once the setup is done, test the tester.py by simply running it.

It should provide the following output:

```
Creating Database named as ddsassignment2
A database named ddsassignment2 already exists
Getting connection from the ddsassignment2 database
Creating and Loading the ratings table
Doing the Range Partitions
Doing the Round Robin Partitions
Performing Range Query
Performing Point Query
```

Now, you can implement your functions in Assignment2\_Interface.py and once done, use the tester again to generate the output.

**DONOT CHANGE** tester.py and Assignment1.py. Changing anyone of these would cause problems and the system will stop working, and may lead to **deduction of marks**.

**PLEASE KEEP IN MIND**, this tester is just for your help. For grading purpose, an additional set of test cases would be used. It will try to break your code. So, please provide the functionalities accordingly, so that it handles all possible scenarios.

**Instructions for Assignment: -**

Please follow these instructions closely **else Marks will be deducted**.

1. Please follow the function signature as provided in the Assignment2\_Interface.py.
2. Please use the same database name, table name, user name and password as provided in the assignment to keep it consistent.
3. Please make sure to run the provided tester and make sure there is no indentation error. In case of **any compilation error, 0 marks will be given**.
4. Do not modify Assignment1.pyc library and tester.py. In case **any modification is needed, please post the same on discussion board**.
5. **For any case of doubt in the assignment, PLEASE USE Discussion Boards, Individual mails would not be entertained.**
6. **Also, it is an individual's responsibilities to clarify his/her doubts, so read and use Discussion Board extensively.**

**Submission Instructions: -**

Upload the completed Assignment2\_Interface.py to blackboard.

**Note: -**






Failure to follow the instructions provided in the document will result in the loss of the points.

**Information about the database created via tester.py file: -****Tables and its structure: -**1. *Ratings*

<b>userid</b> <b>integer</b>	<b>movieid</b> <b>integer</b>	<b>rating</b> <b>real</b>
1	122	0.5






2. *RangeRatingsPart0* to *RangeRatingsPartN* (where N = number of partition - 1)

- Same structure as *Ratings* table
- If value of N is 5 then here is the list of table created for Range Partitioning.

+		rangeratingspart0
+		rangeratingspart1
+		rangeratingspart2
+		rangeratingspart3
+		rangeratingspart4

3. *RoundRobinRatingsPart0* to *RoundRobinRatingsPartN* (where N = number of partition - 1)

- Same structure as *Ratings* table
- If value of N is 5 then here is the list of table created for Round Robin Partitioning

+		roundrobinratingspart0
+		roundrobinratingspart1
+		roundrobinratingspart2
+		roundrobinratingspart3
+		roundrobinratingspart4

4. *RangeRatingsMetadata*

<b>partitionnum</b> <b>integer</b>	<b>minrating</b> <b>real</b>	<b>maxrating</b> <b>real</b>
0	0	1
1	1	2
2	2	3
3	3	4
4	4	5

If *PartitionNum* is 0, then it means table *RangeRatingsPart0* is being referred and this table contains records for rating values  $\geq$  minrating and  $\leq$  maxrating.

If *PartitionNum* is N (N > 1), then it means table *RangeRatingsPartN* is being referred and this table contains records for rating values  $>$  minrating and  $\leq$  maxrating.

Example: - If N is 1, the *RangeRatingsPart1* is being referred and this partition contains all the record for which the rating values are  $1 < \text{value} \leq 2$ .

5. *RoundRobinRatingsMetadata*

<b>partitionnum</b> <b>integer</b>	<b>tablenextinsert</b> <b>integer</b>
5	0

*Partitionnum* denotes total number of partition and *tablenextinsert* denotes that next partition the record should be inserted.