Assignment 1

PSTAT 135/235

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MovieLens Dataset

In this assignment, we will be working on a new dataset. To download it paste the following URL into your laptop's browser: `http://files.grouplens.org/datasets/movielens/ml-latest.zip`. Alternatively, you can also go to `https://grouplens.org/datasets/movielens/` and download `ml-latest.zip`.

This dataset has around 27 million ratings on about 58,000 movies done by over 280,000 users and last updated on 9/2018. Unzip this 288 MB file. For the purpose of this assignment we will be using only two of the files that are included:

1. `movies.csv` (2.9 MB)
2. `ratings.csv` (760 MB).

Question 1: Uploading Data to BigQuery

Upload these two files into a dataset in BigQuery and call it `movie_ratings`.

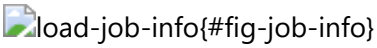
Create a new dataset and call it `movie_ratings`. We will load these two files into the newly created dataset two ways: using the web interface and agian using cloud shell.

Question 1a: `movies` table

To create `movies` table from `movies.csv` file,

1. Download the zipped file
2. Unzip the archive
3. In your BigQuery interface, select in the resources list `<YOUR-PROJECT-ID>` > `movie_ratings` > click **"CREATE TABLE"** button
4. `Create table from`: `Upload`
   `Select file`: BROWSE and find `movies.csv` from your computer
   `Table`: `movies`
   Schema `Auto detect`: check

Find your LOAD job information from `PROJECT HISTORY` (next to `PERSONAL HISTORY`) at the bottom. Mine looks like @fig-job-info

 load-job-info{#fig-job-info}

Post screenshot of your LOAD job information here:

Load job details

Job ID	pstat235-zw:US.bquxjob_613aede1_185eb68d8c2
User	zijianwan@ucsb.edu
Location	US
Creation time	Jan 25, 2023, 4:09:57 PM UTC-8
Start time	Jan 25, 2023, 4:09:57 PM UTC-8
End time	
Duration	2 sec
Auto-detect schema	true
Ignore unknown values	false
Source format	CSV
Max bad records	0
Destination table	pstat235-zw.movie_ratings.movies

REPEAT LOAD JOB CLOSE

{#fig-movies-job-info}

Question 1b: `ratings` table

Follow the same procedure as Question 1a to crate `ratings` table from `ratings.csv`. What happens?

Local uploads are limited to 100 MB. We are advised to use Google Cloud Storage for larger files.

PSTAT 135 Students: Upload `ratings.csv` file to Cloud Storage and create `ratings` table from it using the web interface. Then, post the screenshot of your LOAD job information here:

Replace this text with your screenshot image

PSTAT 235 Students: Upload `ratings.csv` file to Cloud Storage and create `ratings` table using the commmand line tools: `bq` and `gsutil`.

1. Verify the location of `ratings.csv` file using Cloud Storage command:

```
gsutil ls gs://<YOUR-BUCKET-NAME>
```

   Note your the path to your `ratings.csv` file (referred to as `<RATINGS-FILE-LOCATION>` below).

2. Create an empty table with `bq`. Read the documentation, `bq mk --help` to fill-in the blanks in the code below:

```
bq mk ________
```

3. Using `bq` command to load `movie_ratings.ratings` table with contents from `<RATINGS-FILE-LOCATION>`. Read the documentation, `bq load --help` to fill-in the blanks in the code below:

```
bq load --autodetect ________  ________
```

Replace the section below with your own commands:

```
gsutil ls gs://pstat235-zw
bq mk movie_ratings.ratings
bq load --autodetect movie_ratings.ratings gs://pstat235-zw/ratings.csv
```

Also, post screenshot of your LOAD job information here:

Load job details

Job ID	pstat235-zw:US.bqjob_r1043fd657450a053_00000185eb7993e4_1
User	zijianwan@ucsb.edu
Location	US
Creation time	Jan 25, 2023, 4:28:11 PM UTC-8
Start time	Jan 25, 2023, 4:28:12 PM UTC-8
End time	Jan 25, 2023, 4:28:51 PM UTC-8
Duration	39 sec
Auto-detect schema	true
Ignore unknown values	
Source format	
Max bad records	0
Destination table	pstat235-zw.movie_ratings.ratings

REPEAT LOAD JOB CLOSE

{#fig-ratings-job-info}

Question 2: `ratings` table number of rows

How many rows are there in `ratings` table? **C**

A. 27753445
B. 27000001
C. 27753444 D. 27000000

Question 3: `movies` table number of rows

How many rows are there in the `movies` table? **D**

A. 57999
B. 58000
C. 58097
D. 58098

Question 3: number of unique movies

How many unique `movieId`'s are in `ratings` table? **C**

A. 52019
B. Around 27 million
C. 53889
D. 58097

What is your SQL code to obtain the info?

```
SELECT COUNT(DISTINCT movieId)
FROM pstat235-zw.movie_ratings.ratings
```

Question 4: highly rated movies

Which one of these movies are among top 10 highly rated movies, with at least 10,000 reviews? (select all that apply) **C**

A. Star Wars: Episode IV - A New Hope (1977)
B. Chinatown (1974)
C. Godfather
D. Casablanca (1942)

What is your SQL code to obtain the info?

```
SELECT title, COUNT(*) AS review_count, AVG(rating) AS avg_rating
FROM pstat235-zw.movie_ratings.ratings
INNER JOIN pstat235-zw.movie_ratings.movies ON pstat235-zw.movie_ratings.movies.movieId =
pstat235-zw.movie_ratings.ratings.movieId
GROUP BY title
HAVING review_count > 10000
ORDER BY avg_rating DESC
LIMIT 10;
```

Question 5: most watched movies

Which movie is the most watched? Make an assumption that number of ratings is strongly correlated with number of people watching it. **A**

A. Shawshank Redemption
B. Forrest Gump (1994)
C. Matrix
D. Toy Story (1995)

What is your SQL code to obtain the info?

To find the most watched movie,

```
SELECT title, COUNT(userId) AS user_count, AVG(rating) AS avg_rating
FROM pstat235-zw.movie_ratings.ratings
INNER JOIN pstat235-zw.movie_ratings.movies ON pstat235-zw.movie_ratings.movies.movieId =
pstat235-zw.movie_ratings.ratings.movieId
```

```
GROUP BY title
ORDER BY user_count DESC
LIMIT 10;
```

To examine the correlation between the number of ratings and the number of people watching,

```
SELECT CORR(rating_count, user_count) AS corr
FROM (
SELECT title, COUNT(*) AS rating_count, COUNT(userId) AS user_count
FROM pstat235-zw.movie_ratings.ratings
INNER JOIN pstat235-zw.movie_ratings.movies ON pstat235-zw.movie_ratings.movies.movieId =
pstat235-zw.movie_ratings.ratings.movieId
GROUP BY title
);
```

The correlation is 1. The number of ratings is strongly correlated with the number of people watching it.