# 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`.

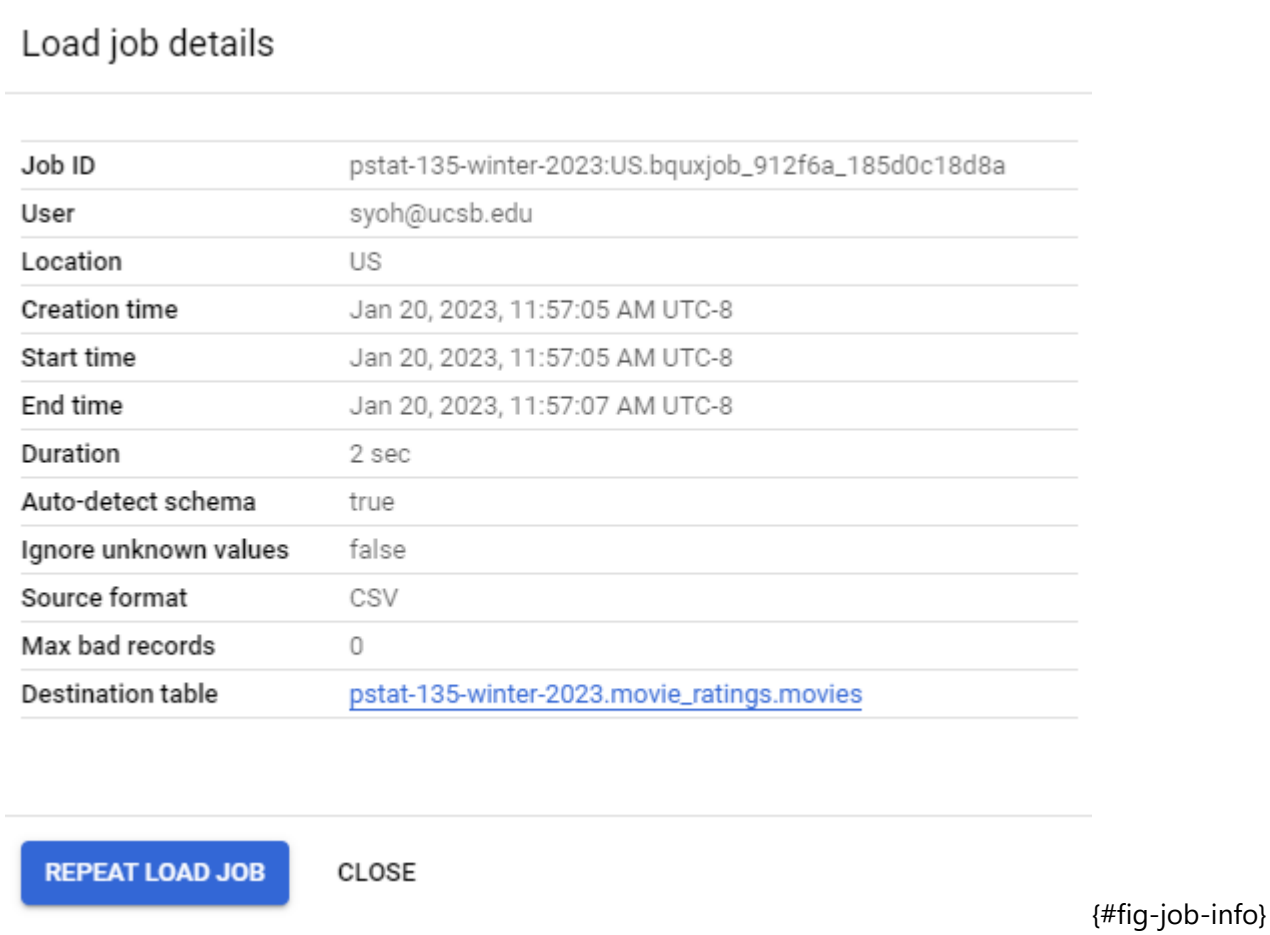
Create a new dataset and call it `movie_ratings`. We will load these two files into the newly created dataset two ways: using the web interface and agian using cloud shell.

### 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

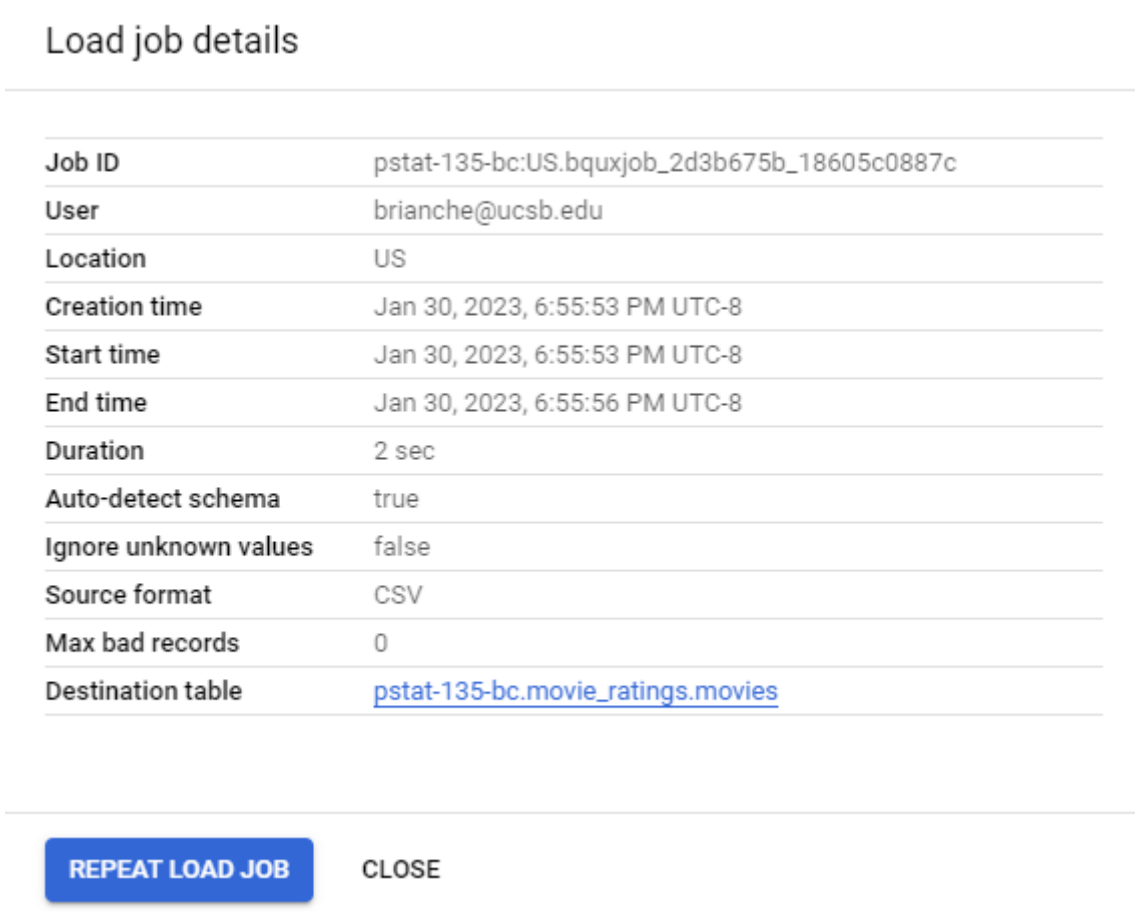


Load job details

| | |
|---|---|
| Job ID | pstat-135-winter-2023:US.bquxjob_912f6a_185d0c18d8a |
| User | syoh@ucsb.edu |
| Location | US |
| Creation time | Jan 20, 2023, 11:57:05 AM UTC-8 |
| Start time | Jan 20, 2023, 11:57:05 AM UTC-8 |
| End time | Jan 20, 2023, 11:57:07 AM UTC-8 |
| Duration | 2 sec |
| Auto-detect schema | true |
| Ignore unknown values | false |
| Source format | CSV |
| Max bad records | 0 |
| Destination table | pstat-135-winter-2023.movie_ratings.movies |

REPEAT LOAD JOB CLOSE

{#fig-job-info}



Load job details

| | |
|---|---|
| Job ID | pstat-135-bc:US.bquxjob_2d3b675b_18605c0887c |
| User | brianche@ucsb.edu |
| Location | US |
| Creation time | Jan 30, 2023, 6:55:53 PM UTC-8 |
| Start time | Jan 30, 2023, 6:55:53 PM UTC-8 |
| End time | Jan 30, 2023, 6:55:56 PM UTC-8 |
| Duration | 2 sec |
| Auto-detect schema | true |
| Ignore unknown values | false |
| Source format | CSV |
| Max bad records | 0 |
| Destination table | pstat-135-bc.movie_ratings.movies |

REPEAT LOAD JOB CLOSE

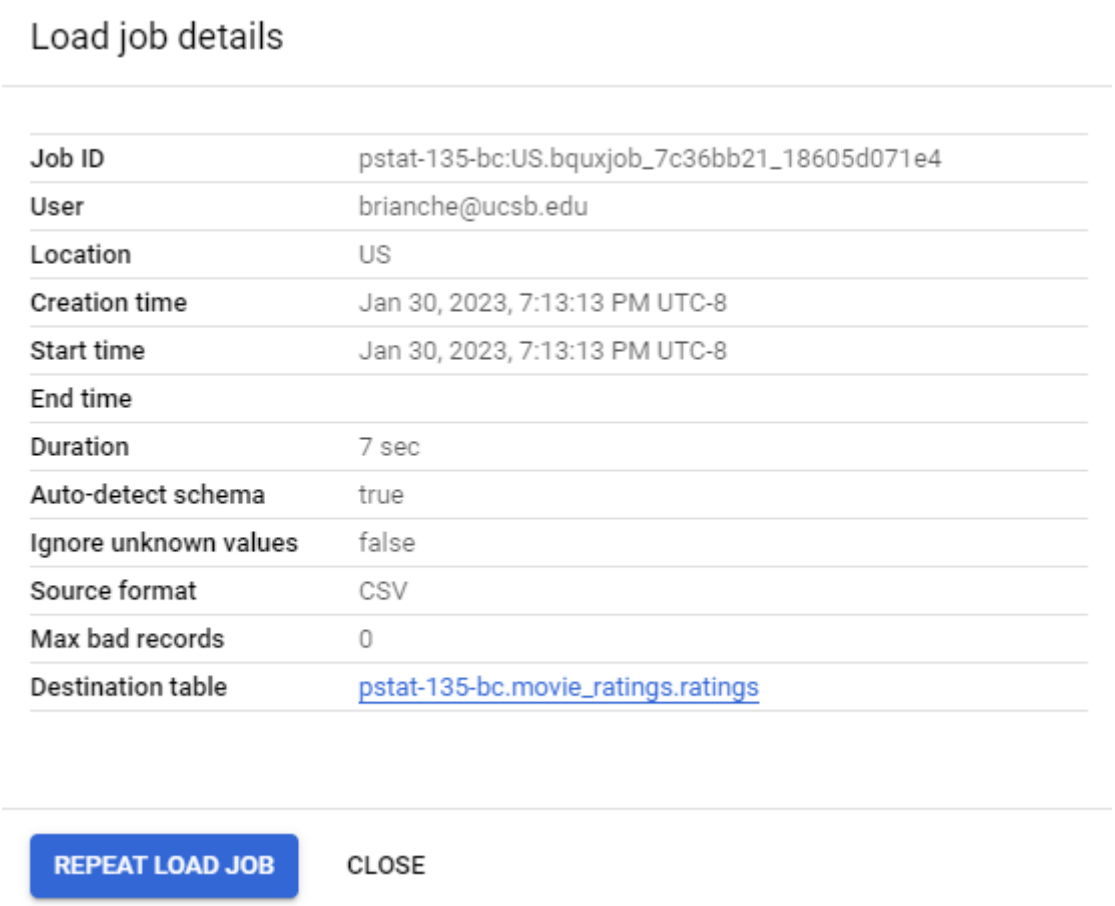
{#load-job-1}

## Question 1b: `ratings` table

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

When attempting to create the file, there is an error that says that it is too large and to use Google Cloud Storage.

**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:




{#load-job-2}

**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://<YOUR-BUCKET-NAME>
bq mk _______
bq load --autodetect _______  _______
```

Also, post screenshot of your LOAD job information here:

**Replace this text with your screenshot image**

## Question 2: `ratings` table number of rows

How many rows are there in `ratings` table?

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

Answer: C. 27753444

## Question 3: `movies` table number of rows

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

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

Answer: D. 58098

## Question 3: number of unique movies

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

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

Answer: C. 53889

What is your SQL code to obtain the info?

SELECT COUNT(DISTINCT movieId) FROM `pstat-135-bc.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)

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

Answer: C. Godfather was one of the movies among the top 10 highly rated movies with at least 10,000 reviwes having an average rating of 4.42.

What is your SQL code to obtain the info?

SELECT A.title, COUNT(A.movieId) AS NumberOfReviews, AVG(B.rating) as AverageRating FROM `pstat-135-bc.movie_ratings.movies` A INNER JOIN `pstat-135-bc.movie_ratings.ratings` B ON A.movieId = B.movieId GROUP BY A.title HAVING NumberOfReviews >= 10000 ORDER BY AverageRating 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. Shawshank Redemption
B. Forrest Gump (1994)
C. Matrix
D. Toy Story (1995)

A. Shawshank Redemption was the most watched with 9799 reviews.

What is your SQL code to obtain the info?

SELECT A.title, COUNT(B.Rating) as NumberOfReviews FROM `pstat-135-bc.movie_ratings.movies` A INNER JOIN `pstat-135-bc.movie_ratings.ratings` B ON A.movieId = B.movieId GROUP BY A.title ORDER BY NumberOfReviews DESC