

Fundamentals of Data Engineering

Week 03 - sync session

datascience@berkeley

Overview

- Go over Assignment 2 results
- Dive into command line tools for figuring out what you have in datasets
- Setting up BigQuery from the command line
- What's up next?

Assignment 2

What was your coolest query?

- take a minute, be ready to present

What's the size of this dataset? (i.e., how many trips)

983648

```
#standardSQL  
SELECT count(*) FROM `bigquery-public-data.san_francisco.bikeshare_trips`
```

What is the earliest start time and latest end time for a trip?

2013-08-29 09:08:00 2016-08-31 23:48:00

```
#standardSQL
SELECT min(start_date)
FROM `bigquery-public-data.san_francisco.bikeshare_trips`

#standardSQL
SELECT max(end_date)
FROM `bigquery-public-data.san_francisco.bikeshare_trips`
```

How many bikes are there?

700

```
#standardSQL  
SELECT count(distinct bike_number)  
FROM `bigquery-public-data.san_francisco.bikeshare_trips`
```

Housekeeping

- Channel etiquette

Activities: async content

- You got started with lots of stuff this week
- Working with files: json, csv etc

Finding stuff out about your data

Download Datasets

Save data into your `w205` directory

```
cd ~/w205  
curl -L -o annot_fpid.json https://goo.gl/qWiu7d  
curl -L -o lp_data.csv https://goo.gl/FDFPYB
```

What's in this file?

```
head lp_data.csv
```

```
tail lp_data.csv
```

What are variables in here?

```
head -n1 lp_data.csv
```

How many entries?

```
cat lp_data.csv | wc -l
```

How about sorting?

```
cat lp_data.csv | sort
```


Take a look at what options there are for
sort

```
man sort
```

fix so sorting correctly

```
cat lp_data.csv | sort -g
```

```
cat lp_data.csv | sort -n
```

Find out which topics are more popular

What have we got in this file?

```
head annot_fpid.json
```

Hmmm, what now? jq

pretty print the json

```
cat annot_fpid.json | jq .
```

Just the terms

```
cat annot_fpid.json | jq '[][]'
```

Remove the “”s

```
cat annot_fpid.json | jq '[][]' -r
```

Can we sort that?

```
cat annot_fpid.json | jq '[][]' -r | sort
```


Unique values only

```
cat annot_fpid.json | jq '[][]' -r |  
sort | uniq
```

How could I find out how many of each of those unique values there are?

```
cat annot_fpid.json | jq '[][]' -r |  
sort | uniq -c
```

Now, how could I sort by that?

```
cat annot_fpid.json | jq '[][]' -r |  
sort | uniq -c | sort -g
```

Ascending

```
cat annot_fpid.json | jq '[][]' -r |  
sort | uniq -c | sort -gr
```

Descending

So, what are the top ten terms?

```
cat annot_fpid.json | jq '[][]' -r |  
sort | uniq -c | sort -gr | head -10
```

bq cli

setup

(from your mids droplet)

- auth the GCP client

```
gcloud init
```

and copy/paste the link

- associate bq with a project

```
bq
```

and select project if asked

```
bq query --use_legacy_sql=false '  
SELECT count(*)  
FROM `bigquery-public-data.san_francisco.bikeshare_status`'
```

How many stations are there?


```
bq query --use_legacy_sql=false '  
SELECT count(distinct station_id)  
FROM `bigquery-public-data.san_francisco.bikeshare_status` '
```

How long a time period do these data cover?

```
bq query --use_legacy_sql=false '  
SELECT min(time), max(time)  
FROM `bigquery-public-data.san_francisco.bikeshare_status`'
```

Generate Ideas

- What do you know?
- What will you need to find out?

Summary

- Command line tools and jq to dive into your data
- BigQuery from the command line

Extras

Resources

sed and awk

<http://www.catonmat.net/blog/awk-one-liners-explained-part-one/> <http://www.catonmat.net/blog/sed-one-liners-explained-part-one/>

jq

<https://stedolan.github.io/jq/tutorial/>

Advanced options

Sort by 'product_name'

```
cat lp_data.csv | awk -F',' '{ print $2,$1 }' | sort
```

Fix the “”s issue

```
cat lp_data.csv | awk -F',' '{ print $2,$1 }' | sed 's/"//' | sort |
```

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