DAMG6210 – FINAL PROJECT

NEW YORK CITI-BIKE SHARE

Q1 How many bike trips and what is the trend over time

- calendar year (2017)

```sql
SELECT
  COUNT(starttime) as No_of_trips
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  EXTRACT (YEAR
  FROM
    starttime) = 2017;
```
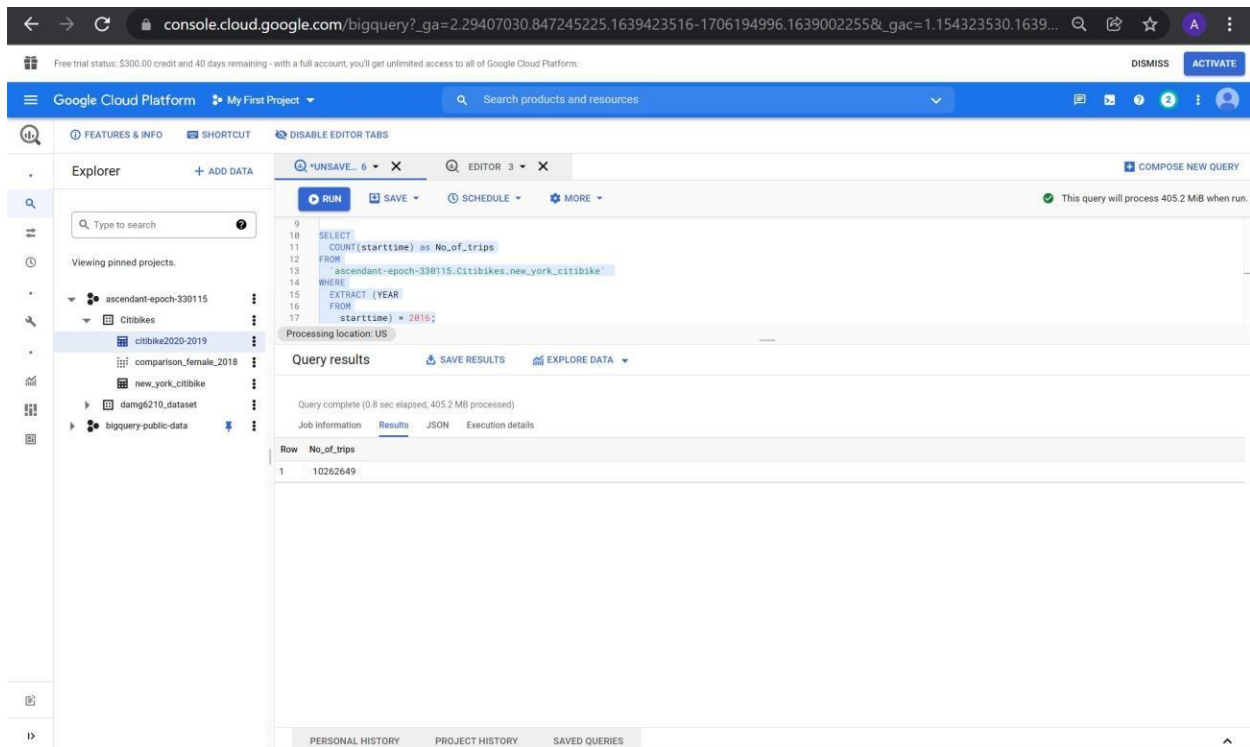


```sql
SELECT
  COUNT(starttime) as No_of_trips
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  EXTRACT (YEAR
  FROM
    starttime) = 2016;
```

- calendar month & year (2017-09)

```
SELECT
  COUNT(starttime) AS No_of_trips
FROM
 `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  EXTRACT (YEAR
  FROM
    starttime) = 2017
  AND EXTRACT(month
  FROM
    starttime) = 9;
```

Row	No_of_trips
1	1878098

```
SELECT
  COUNT(starttime) AS No_of_trips
FROM
   `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  EXTRACT (YEAR
```

```
FROM
  starttime) = 2016
AND EXTRACT(month
FROM
  starttime) = 9;
```

Row	No_of_trips
1	16488 56

- calendar week (2017-36)

```
SELECT
  COUNT(starttime) as No_of_trips
FROM
`ascendant-epoch-330115.Citibikes.new_york_citibike`

WHERE
  EXTRACT (WEEK
  FROM
    starttime) = 36
  AND EXTRACT (YEAR
  FROM
    starttime) = 2017;
```

```sql
SELECT
  COUNT(starttime) as No_of_trips
FROM
`ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  EXTRACT (WEEK
  FROM
    starttime) = 36
  AND EXTRACT (YEAR
  FROM
    starttime) = 2016;
```

- calendar day (2017-09-01)

Q2 Average number of bike trips and may also want to compare YOY (year over year) changes
- per day, i.e., Sunday, Monday-Saturday

```sql
SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 1
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 1
    AND EXTRACT(year
```

```
FROM
  starttime) = 2016);
```

Row	Avg_no_of_trips
1	145301 2.5

```
SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
`ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 2
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 2
    AND EXTRACT(year
    FROM
      starttime) = 2016);
```

Row	Avg_no_of_trips
1	169905 8.5

```
SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
`ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 3
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 3
    AND EXTRACT(year
```

```
    FROM
      starttime) = 2016);
```

Row	Avg_no_ of_trips
1	185370 2.0

```
SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 4
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 4
    AND EXTRACT(year
    FROM
      starttime) = 2016);
```

Row	Avg_no_ of_trips
1	195540 6.0

```
SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
 `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 5
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 5
    AND EXTRACT(year
    FROM
      starttime) = 2016);
```

R o w	Avg_no_ of_trips
1	192443 8.5

```sql
SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 6
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 6
    AND EXTRACT(year
    FROM
      starttime) = 2016);
```

R o w	Avg_no_ of_trips
1	179850 4.0

```sql
SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
`ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 7
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 7
    AND EXTRACT(year
    FROM
      starttime) = 2016)
```

R o w	Avg_no_ of_trips
1	150653 7.5

- weekday versus weekend

```sql
SELECT
  COUNT(starttime)/5 Avg_no_of_trips
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 2
      or EXTRACT(dayofweek
    FROM
      starttime) = 3
      or EXTRACT(dayofweek
    FROM
      starttime) = 4
      or EXTRACT(dayofweek
    FROM
      starttime) = 5
      or EXTRACT(dayofweek
    FROM
      starttime) = 6
      );
```

R o w	Avg_no_ of_trips
1	806504 1.4

```sql
SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 1
      or EXTRACT(dayofweek
    FROM
      starttime) = 7)
```

Row	Avg_no_of_trips
1	6391757.0

- month

```sql
SELECT
  COUNT(starttime)/2 value
FROM
`ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  (EXTRACT(month
    FROM
      starttime)= 1
    OR EXTRACT(year
    FROM
      starttime) = 2017)
  AND (EXTRACT(month
    FROM
      starttime)= 1
    AND EXTRACT(year
    FROM
      starttime) = 2016);
```

Row	value
1	254739.0

- calendar week

```sql
SELECT
  COUNT(starttime)/2
FROM
`ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  (EXTRACT(week
```

```
  FROM
    starttime)= 1
  OR EXTRACT(year
  FROM
    starttime) = 2017)
 AND (EXTRACT(week
  FROM
    starttime)= 1
  AND EXTRACT(year
  FROM
    starttime) = 2016);
```

Row	f0_
1	775 21.0

Q3 Examining when trips occur during the day.
- Breakdown of subscriber (or member) vs customer (non-subscriber) rides
- How many bike trips occur during what periods of the day?
- By hour (0900, 1300)
- During periods during the day i.e., morning 6am-11:59am, afternoon noon-5:59pm, evening 6pm-10pm

```
--Morning
SELECT
  COUNT(*) TOTAL_BIKE_TRIPS_DURING_MORNING
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  EXTRACT(hour
  FROM
    starttime) >= 6
  AND EXTRACT(hour
  FROM
    stoptime) < 12
```

```
    AND (EXTRACT(date
      FROM
        starttime) = EXTRACT(date
      FROM
        stoptime));
```

R o w	TOTAL_BIKE_TRIPS_D URING_MORNING
1	15116506

```
--Afternoon
SELECT
  COUNT(*) TOTAL_BIKE_TRIPS_DURING_afternoon
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  EXTRACT(hour
  FROM
    starttime) >= 12
  AND EXTRACT(hour
  FROM
    stoptime) < 6
  AND (EXTRACT(date
    FROM
      starttime) = EXTRACT(date
    FROM
      stoptime));
```

R o w	TOTAL_BIKE_TRIPS_D URING_afternoon
1	0

```
--Evening
SELECT
  COUNT(*) TOTAL_BIKE_TRIPS_DURING_EVENING
FROM
 `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  EXTRACT(hour
  FROM
    starttime) >= 18
  AND EXTRACT(hour
  FROM
    stoptime) < 22
  AND (EXTRACT(date
    FROM
```

```
    starttime) = EXTRACT(date
  FROM
    stoptime))
```

R o w	TOTAL_BIKE_TRIPS_D URING_EVENING	
1	12198774	

- How many round trips (start and end station are the same) versus non-round trips (different start and end station)

```
--Same start and end station
SELECT
  COUNT(start_station_id)
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  start_station_id = end_station_id;
```

R o w	f0_
1	1144 735

```
--different start and end station
SELECT
  COUNT(start_station_id)
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  start_station_id <> end_station_id;
```

R o w	f0_
1	5196 3986

- Further breakdown subscriber vs customer

```sql
--same start and end station for customer usertype
SELECT
  COUNT(start_station_id)
FROM
 `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  start_station_id = end_station_id
  AND usertype = "Customer";
```

Row	f0_
1	424241

```sql
--different start and end station for customer usertype
SELECT
  COUNT(start_station_id)
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  start_station_id <> end_station_id
  AND usertype = "Customer";
```

Row	f0_
1	5766908

```sql
-- same start and end station for subscriber usertype
SELECT
  COUNT(start_station_id)
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  start_station_id = end_station_id
  AND usertype = "Subscriber";
```

Row	f0_
1	720494

```
--different start and end station for subscriber usertype
SELECT
  COUNT(start_station_id)
FROM
`ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  start_station_id <> end_station_id
  AND usertype = "Subscriber";
```

Row	f0_
1	4619 7078

- Average length of trip

```
SELECT
  avg(tripduration) Avg_trip_duration
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  start_station_id <> end_station_id;
```

Row	Avg_trip_duration
1	945.015035 7018551

Q4 Examining length of trips
- Length of trips (in time)
- What is the average length (in minutes) of bike trip?

```
--avg trip duration
SELECT
  AVG(tripduration/60) Avg_trip_duration_in_mins
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`;
```

Row	Avg_trip_duration_in_mins

1	16.04151642
	5648236

- Further breakdown by subscriber versus customer

```
--avg trip duration FOR customer usertype
SELECT
  AVG(tripduration/60) Avg_trip_duration_in_mins
FROM
 `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  usertype="Customer";
```

Row	Avg_trip_durati on_in_mins	
1	35.75853458 4345085	

```
--avg trip duration FOR subscriber usertype
SELECT
  AVG(tripduration/60) Avg_trip_duration_in_mins
FROM
 `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  usertype="Subscriber"
```

Row	Avg_trip_durati on_in_mins	
1	13.43969812 9164432	

- How many trips are less than 15 minutes in duration?

```
SELECT
  COUNT(*)Trips_less_than_15_Mins
FROM
 `ascendant-epoch-330115.Citibikes.new_york_citibike`

WHERE
  tripduration/60 < 15
```

R o w	Trips_less_than_15_Mins
1	36001298

- How many trips are greater than 15 minutes but less than 1 hour in duration?

```
SELECT
  COUNT(tripduration) value
FROM
  `ascendant-epoch-330115.Citibikes.citibike2020-2019`
WHERE
  (tripduration/60 > 15)
  AND (tripduration/60 < 60)
```

R o w	value
1	1652 1443

- How many trips are greater than 1 hour in duration?

```
SELECT
  COUNT(tripduration) value
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  (tripduration/60 > 60)
```

R o w	valu e
1	558 858

Note:
May help identify commuters, occasional users (getting around town) and tourists.

Q5 Most popular stations

- What are the top 10 bike stations based on bike trips?

```
SELECT
  start_station_name,
  COUNT(start_station_name) count_value
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
  where start_station_name != "" and start_station_name is not null
GROUP BY
  start_station_name
ORDER BY
  COUNT(start_station_name) desc
LIMIT
  10;
```

Row	start_station_name	count_value
1	Pershing Square North	438077
2	E 17 St & Broadway	423334
3	W 21 St & 6 Ave	403795
4	8 Ave & W 31 St	401554
5	West St & Chambers St	384116
6	Lafayette St & E 8 St	372255
7	Broadway & E 22 St	367194
8	Broadway & E 14 St	344546
9	8 Ave & W 33 St	330378
10	Cleveland Pl & Spring St	318700
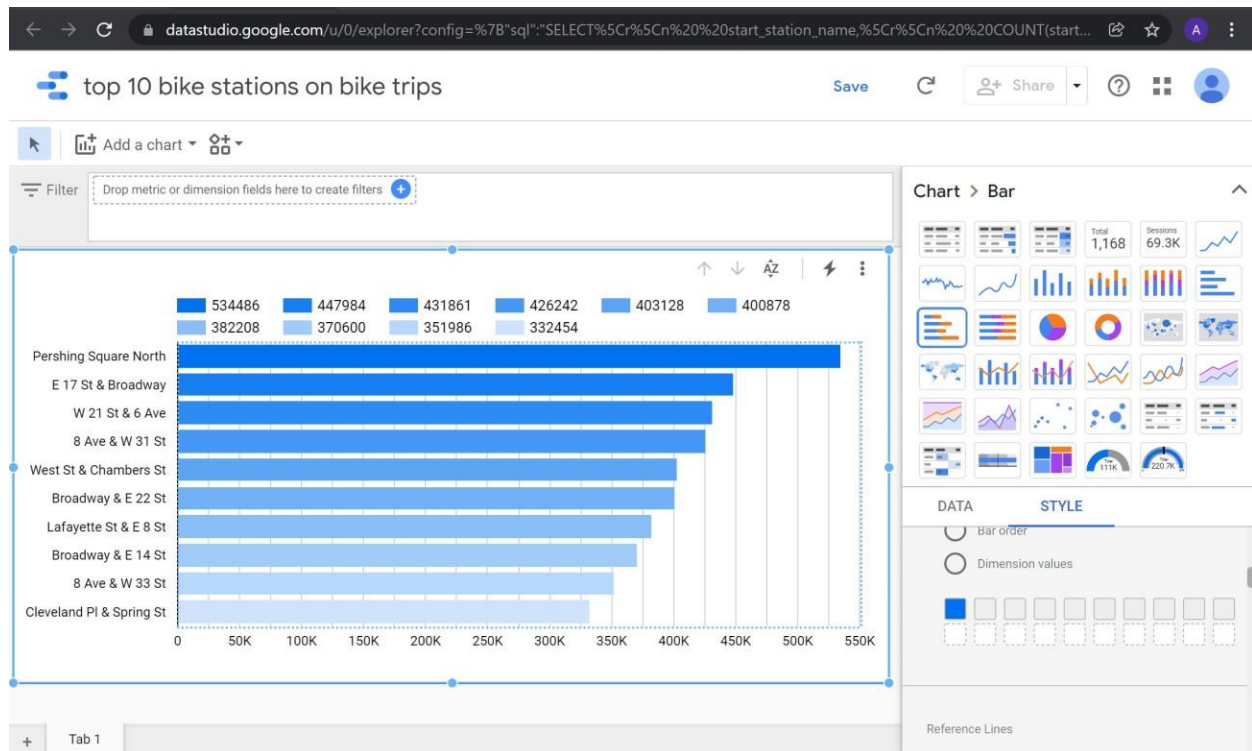
- For staring a trip

```sql
SELECT
    start_station_name,
    COUNT(start_station_name)
FROM
    `ascendant-epoch-330115.Citibikes.new_york_citibike`
    where start_station_name != "" and start_station_name is not null
GROUP BY
    start_station_name
ORDER BY
    COUNT(start_station_name) desc
LIMIT
    10;
```

Row	start_station_name	f0_		
1	Pershing Square North	438 077		
2	E 17 St & Broadway	423 334		

Row	start_station_name	f0_
3	W 21 St & 6 Ave	403795
4	8 Ave & W 31 St	401554
5	West St & Chambers St	384116
6	Lafayette St & E 8 St	372255
7	Broadway & E 22 St	367194
8	Broadway & E 14 St	344546
9	8 Ave & W 33 St	330378
10	Cleveland Pl & Spring St	318700

- As a trip destination

```sql
SELECT
  end_station_name,
  COUNT(end_station_name)
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
  where start_station_name != "" and start_station_name is not null
GROUP BY
  end_station_name
ORDER BY
  COUNT(end_station_name) desc
LIMIT
  10;
```

Row	end_station_name	f0_
1	E 17 St & Broadway	444460

Row	end_station_name	f0_
2	Pershing Square North	419 931
3	W 21 St & 6 Ave	407 982
4	West St & Chambers St	399 033
5	Broadway & E 22 St	377 854
6	Lafayette St & E 8 St	372 679
7	8 Ave & W 31 St	365 306
8	Broadway & E 14 St	344 033
9	W 20 St & 11 Ave	323 647

- Overall, as ether a start and/or destination
- Determine the most popular routes (staring to end location)
- Total number of trips

```
SELECT
  start_station_name,
  end_station_name,
  COUNT(*) value
FROM
`ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  start_station_name != ""
  AND end_station_name != ""
GROUP BY
  start_station_name,
  end_station_name
ORDER BY
  COUNT(*) DESC
LIMIT
  1;
```

Row	start_station_name	end_station_name	value
1	Central Park S & 6 Ave	Central Park S & 6 Ave	55703

- Total number of trips by subscriber and customer

```
--Customer
SELECT
  start_station_name,
  end_station_name,
  usertype,
  COUNT(*) value
FROM
 `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  start_station_name != ""
  AND end_station_name != ""
  AND usertype = "Customer"
GROUP BY
  start_station_name,
  end_station_name,
  usertype
ORDER BY
  COUNT(*) DESC
LIMIT
  1;
```

Row	start_station_name	end_station_name	usertype	value
1	Central Park S & 6 Ave	Central Park S & 6 Ave	Customer	46671

```
--Subscriber
SELECT
  start_station_name,
  end_station_name,
  usertype,
  COUNT(*) value
FROM
`ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
```

```
   start_station_name != ""
   AND end_station_name != ""
   AND usertype = "Subscriber"
GROUP BY
   start_station_name,
   end_station_name,
   usertype
ORDER BY
   COUNT(*) DESC
LIMIT
   1;
```

Row	start_station_name	end_station_name	usertype	value
1	W 21 St & 6 Ave	9 Ave & W 22 St	Subscriber	17260

- Further breakdowns (examples): time of day, weekday vs weekend, month

```
-time of day 9 am
SELECT
   start_station_name,
   end_station_name,
   COUNT(*) value
FROM
 `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
   start_station_name != ""
   AND end_station_name != ""
   and extract(hour from starttime) = 9 and extract(hour from stoptime) = 10
GROUP BY
   start_station_name,
   end_station_name
ORDER BY
   COUNT(*) DESC
LIMIT
   1;
```

Row	start_station_name	end_station_name	value

1	Central Park S & 6 Ave	Central Park S & 6 Ave	15 07

// weekend
```sql
SELECT
  start_station_name,
  end_station_name,
  COUNT(*) value
FROM
 `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  start_station_name != ""
  AND end_station_name != ""
  and extract(dayofweek from starttime) = 1 or extract(dayofweek from starttime) = 7
GROUP BY
  start_station_name,
  end_station_name
ORDER BY
  COUNT(*) DESC
LIMIT
  1;
```

Row	start_station_name	end_station_name	value
1	Central Park S & 6 Ave	Central Park S & 6 Ave	258 05

// weekday
```sql
SELECT
  start_station_name,
  end_station_name,
  COUNT(*) value
FROM
 `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  start_station_name != ""
  AND end_station_name != ""
  and extract(dayofweek from starttime) = 2 or extract(dayofweek from starttime) = 3 or extract(dayofweek from starttime) = 4 or extract(dayofweek from starttime) = 5 or extract(dayofweek from starttime) = 6
GROUP BY
  start_station_name,
  end_station_name
ORDER BY
  COUNT(*) DESC
LIMIT
  1;
```

Row	start_station_name	end_station_name	value
1	Central Park S & 6 Ave	Central Park S & 6 Ave	29898

Q6 Gender analysis

- How many trips - female vs male

  Average length of trip - female vs male

- Subscriber versus customer trips - female vs male

- Any trends from 2014 to 2020 regarding above

```sql
--2014 male
SELECT
  gender,
  COUNT(gender) No_of_males_in_2014
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  gender = "male"
  AND EXTRACT (year
  FROM
    starttime) = 2014
GROUP BY
  gender;
```

Row	gender	No_of_males_in_2014
1	male	5635962

```
--2015 male
SELECT
  gender,
  COUNT(gender) No_of_males_in_2015
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  gender = "male"
  AND EXTRACT (year
  FROM
    starttime) = 2015
GROUP BY
  gender;
```

Row	gender	No_of_males_in_2015
1	male	6608929

```
--2016 male
SELECT
  gender,
  COUNT(gender) No_of_males_in_2016
FROM
    `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  gender = "male"
  AND EXTRACT (year
  FROM
    starttime) = 2016
GROUP BY
  gender;
```

Row	gender	No_of_males_in_2016
1	male	6769032

```
--2017 male
SELECT
  gender,
  COUNT(gender) No_of_males_in_2017
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  gender = "male"
  AND EXTRACT (year
```

```sql
  FROM
    starttime) = 2017
GROUP BY
  gender;
```

Row	gender	No_of_males_in_2017
1	male	9306602

```sql
--2014 female
SELECT
  gender,
  COUNT(gender) No_of_females_in_2014
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  gender = "female"
  AND EXTRACT (year
  FROM
    starttime) = 2014
GROUP BY
  gender;
```

Row	gender	No_of_females_in_2014
1	female	1650274

```sql
--2015 females
SELECT
  gender,
  COUNT(gender) No_of_females_in_2015
FROM
    `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  gender = "female"
  AND EXTRACT (year
  FROM
    starttime) = 2015
GROUP BY
  gender;
```

Row	gender	No_of_females_in_2015

Row	gender		
1	female	2006962	

--2016 females

```sql
--2016 females
SELECT
  gender,
  COUNT(gender) No_of_females_in_2016
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  gender = "female"
  AND EXTRACT (year
  FROM
    starttime) = 2016
GROUP BY
  gender;
```

Row	gender	No_of_females_in_2016	
1	female	2186917	

```sql
--2017 females
SELECT
  gender,
  COUNT(gender) No_of_females_in_2017
FROM
  `ascendant-epoch-330115.Citibikes.new_york_citibike`
WHERE
  gender = "female"
  AND EXTRACT (year
  FROM
    starttime) = 2017
GROUP BY
  gender;
```

Row	gender	No_of_females_in_2017	
1	female	3236735	

Q7 Age analysis (note: age at the time of the ride i.e., age is year of bike trip vs birth year)
- What are the number of trips per age?

- Average length of trip per age

- Subscriber versus customer trips – per age

- Any trends from 2014 to 2020 regarding above

```
--NO OF trips per age
SELECT
 (EXTRACT(year
   FROM
    starttime) - birth_year),
COUNT(starttime) no_of_trips
FROM
 `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
GROUP BY
 (EXTRACT(year
   FROM
    starttime) - birth_year)
ORDER BY
 COUNT(*) DESC;

--avg length OF trip per age
SELECT
 (EXTRACT(year
   FROM
    starttime) - birth_year),
 AVG(tripduration)
FROM
 `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
GROUP BY
 (EXTRACT(year
   FROM
    starttime) - birth_year)
ORDER BY
 AVG(tripduration) DESC;

--subscriber vs customer per age
SELECT
 (EXTRACT (year
   FROM
```

```
  starttime) - birth_year),
 gender,
 usertype,
COUNT(*)
FROM
 `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
 gender IN (
 SELECT
   DISTINCT gender
 FROM
   `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`)
GROUP BY
 (EXTRACT(year
   FROM
     starttime) - birth_year),
 gender,
 usertype
ORDER BY
COUNT(*) DESC
```

Q8 Bike Analysis

- What are the top 5 bikes (bike id) for latest (full) year by?

- Total trips

- Total time

- Average trip time

```
 --Morning
SELECT
 COUNT(*) TOTAL_BIKE_TRIPS_DURING_MORNING
FROM
 `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
 EXTRACT(hour
 FROM
   starttime) >= 6
 AND EXTRACT(hour
 FROM
   stoptime) < 12
```

```sql
  AND (EXTRACT(date
   FROM
    starttime) = EXTRACT(date
   FROM
    stoptime));

--Afternoon
SELECT
  COUNT(*) TOTAL_BIKE_TRIPS_DURING_EVENING
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
  EXTRACT(hour
  FROM
   starttime) >= 12
  AND EXTRACT(hour
  FROM
   stoptime) < 6
  AND (EXTRACT(date
   FROM
    starttime) = EXTRACT(date
   FROM
    stoptime))

--Evening
SELECT
  COUNT(*) TOTAL_BIKE_TRIPS_DURING_EVENING
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
  EXTRACT(hour
  FROM
   starttime) >= 18
  AND EXTRACT(hour
  FROM
   stoptime) < 22
  AND (EXTRACT(date
  FROM
    starttime) = EXTRACT(date
   FROM
    stoptime))
```

```sql
SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 1
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 1
    AND EXTRACT(year
    FROM
      starttime) = 2016);

SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 2
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 2
    AND EXTRACT(year
    FROM
      starttime) = 2016);

SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 3
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 3
    AND EXTRACT(year
    FROM
      starttime) = 2016);
```

```sql
SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 4
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 4
    AND EXTRACT(year
    FROM
      starttime) = 2016);

SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 5
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 5
    AND EXTRACT(year
    FROM
      starttime) = 2016);

SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
  (EXTRACT(dayofweek
    FROM
      starttime) = 6
    AND EXTRACT(year
    FROM
      starttime) = 2017)
  OR (EXTRACT(dayofweek
    FROM
      starttime) = 6
    AND EXTRACT(year
    FROM
      starttime) = 2016);
```

```
SELECT
  COUNT(starttime)/2 Avg_no_of_trips
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
 (EXTRACT(dayofweek
   FROM
    starttime) = 7
  AND EXTRACT(year
  FROM
    starttime) = 2017)
 OR (EXTRACT(dayofweek
  FROM
    starttime) = 7
  AND EXTRACT(year
  FROM
    starttime) = 2016)
```

Q9 For top bike (by total trips) create a history for the latest (full) year

- Bike id

- Route (state and end location)

- Start time

- Duration

--total trips

SELECT

 bikeid,

 COUNT(*) no_of_trips_in_latest_year

FROM

 `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`

WHERE

 EXTRACT(year

```sql
FROM
  starttime) = (
SELECT
  (MAX(EXTRACT( year
    FROM
      starttime)))
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`)
GROUP BY
  bikeid
ORDER BY
  COUNT(*) DESC
LIMIT
  5;


--total time
SELECT
  bikeid,
  sum(tripduration) total_time_for_latest_year
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
  EXTRACT(year
  FROM
    starttime) = (
  SELECT
    (MAX(EXTRACT( year
      FROM
        starttime)))
```

```sql
FROM

  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`)

GROUP BY

  bikeid

ORDER BY

  sum(tripduration) DESC

LIMIT

  5;


--avg trip time

SELECT

  bikeid,

  avg(tripduration) avg_trip_duration_for_latest_year

FROM

  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`

WHERE

  EXTRACT(year

  FROM

    starttime) = (

  SELECT

    (MAX(EXTRACT( year

      FROM

        starttime)))

  FROM

    `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`)

GROUP BY

  bikeid

ORDER BY

  avg(tripduration) DESC
```

```sql
LIMIT
  5;


--top bike by bike id
SELECT
  *
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
WHERE
  bikeid = (
  SELECT
    bikeid
  FROM
    `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
  WHERE
    bikeid IS NOT NULL
  GROUP BY
    bikeid
  ORDER BY
    COUNT(*) DESC
  LIMIT
    1)
  AND EXTRACT(year
  FROM
    starttime) = (
  SELECT
  MAX(EXTRACT(year
    FROM
      starttime))
```

```
FROM
  `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`);


--top bike route(start and end station)
select * from `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020` where
bikeid in (
select bikeid from `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
where start_station_name!=""
group by start_station_name, end_station_name, bikeid
order by count(*) desc
limit 1)
and extract(year from starttime) = (select max(extract(year from starttime)) from `dmdd-final-project-
334003.new_york_citibike.new_york_citibike_2019_to_2020`);


--start time
select * from `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020` where
starttime = (
select starttime from `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`
where starttime is not null
group by starttime
order by count(*) desc
limit 1);


--start location
select * from `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020` where
start_station_id = (
select start_station_id from `dmdd-final-project-
334003.new_york_citibike.new_york_citibike_2019_to_2020`
where start_station_id is not null
group by start_station_id, start_station_longitude, start_station_latitude
```

order by count(*) desc

limit 1);

--duration

select * from `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020` where tripduration = (

select tripduration from `dmdd-final-project-334003.new_york_citibike.new_york_citibike_2019_to_2020`

group by tripduration

order by count(*)

limit 1)