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CSC336 Project 2

CitiBike

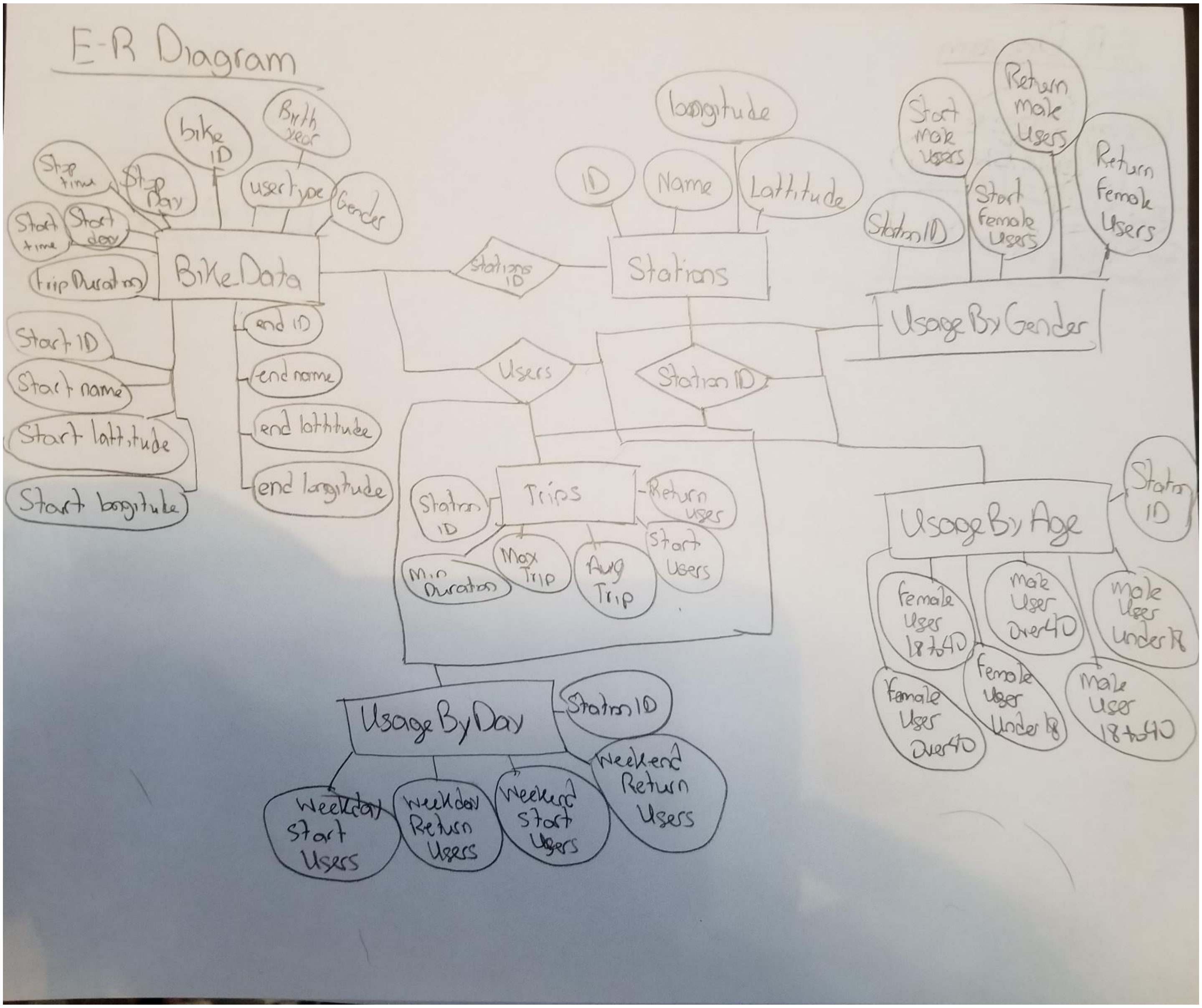
Problem:

In this project we are working with a more larger database than the other projects. In this database it contains information on the Citibike station location and about the user type for the bikes. Then we are required to create an E-R diagram for the table and for entity sets that will created for the project. Next, SQL expressions are needed to fill in required tables. These are Stations, Trips, UsageByDay, UasageByGender, and UsageByAge. Then create SQL expressions to determine the most frequent trips between any two stations by the day of the week. Lastly, we are going to create SQL expressions to find permanently dormant or vacant stations.

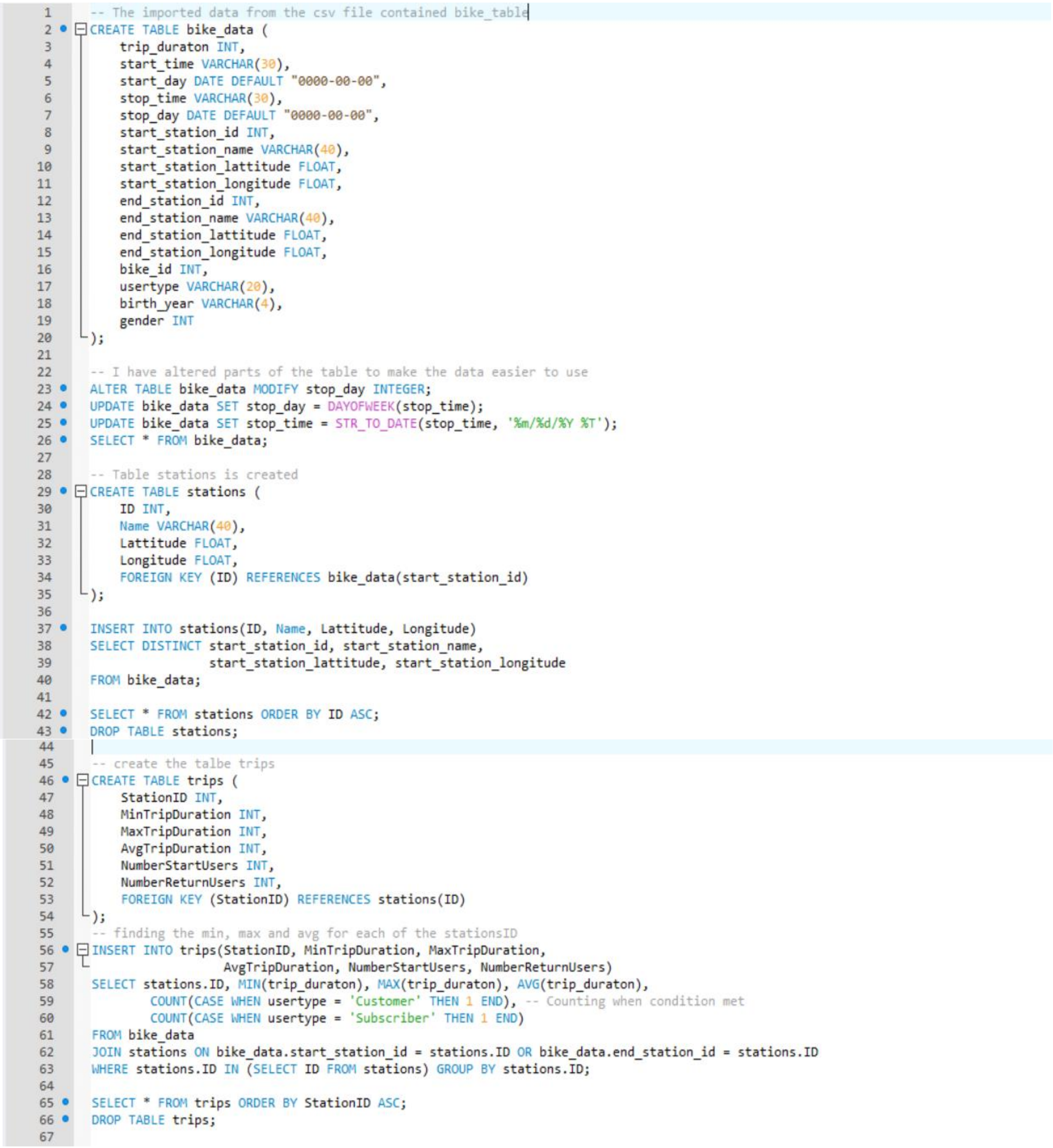
Solutions:

We are going to be using MySQL for this project. First the table needs to be imported into MySQL workbench. From our E-R diagram we have constructed SQL expression in MySQL workbench. Creating a table called bike_data needs to be created for the imported data to be stored. Then creating the other required tables such as Stations, Trips, UsageByDay, UasageByGender, and UsageByAge by using the information from table bike_data. The table stations will contain the ID, name and the location of Citibike stations and it will use the data from the table bike_data. The next table to be created is trips and it will contain a foreign key that references stationsID from the table stations. It also contains the min, max, avg trips from each station and types of user. The listed information will be taken from the table bike_data. In the table UsageByDay it will also reference stationsID from the table stations. Also containing the different types of users depending on the day of the week. This continues for the rest of the tables, they each reference stationsID from the table stations and receive the rest of their information from the first table bike_data. For frequent trips of the project, I used the information from the original table bike_data, seeing the start and end station names. For the last part, a similar query is used for finding the vacant stations.

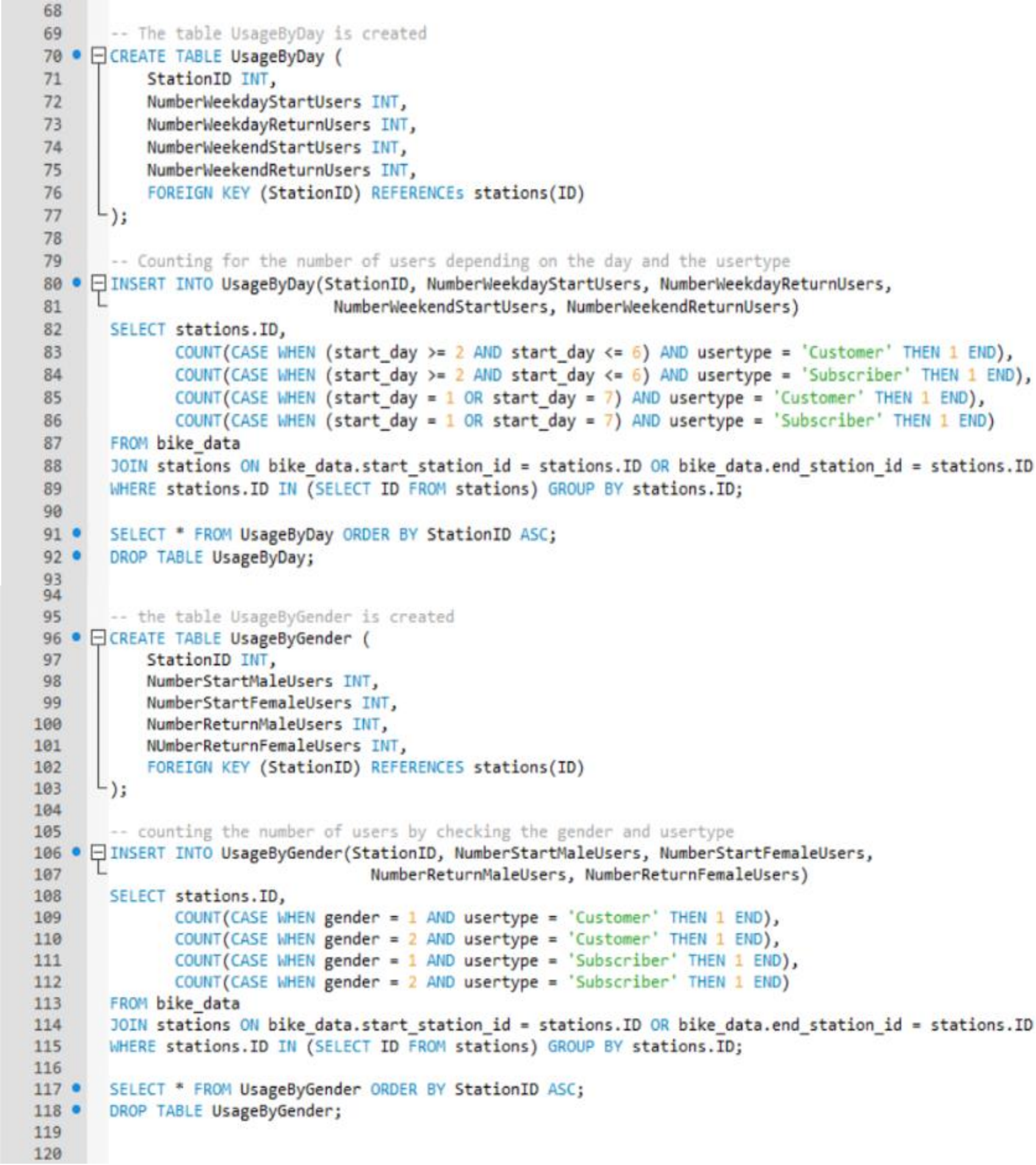
E-R Diagram


E-R Diagram
bike ID
Birth year
Stop time
Stop Day
usertype
Gender
Start time
Start day
Trip Duration
Bike Data
Start ID
Start name
Start lattitude
Start longitude
end ID
end name
end lattitude
end longitude
Stations ID
Stations
longitude
ID
Name
Lattitude
Users
Station ID
Trips
Station ID
Return users
Start Users
Min Duration
Max Trip
Avg Trip
Usage By Gender
Station ID
Start male Users
Return male Users
Start Female Users
Return Female Users
Usage By Age
Station ID
Female Users 18 to 40
male User Over 40
male Users Under 18
Female User Over 40
Female User Under 18
male User 18 to 40
Usage By Day
Station ID
Weekday Start Users
weekday Return Users
Weekend Start Users
Weekend Return Users

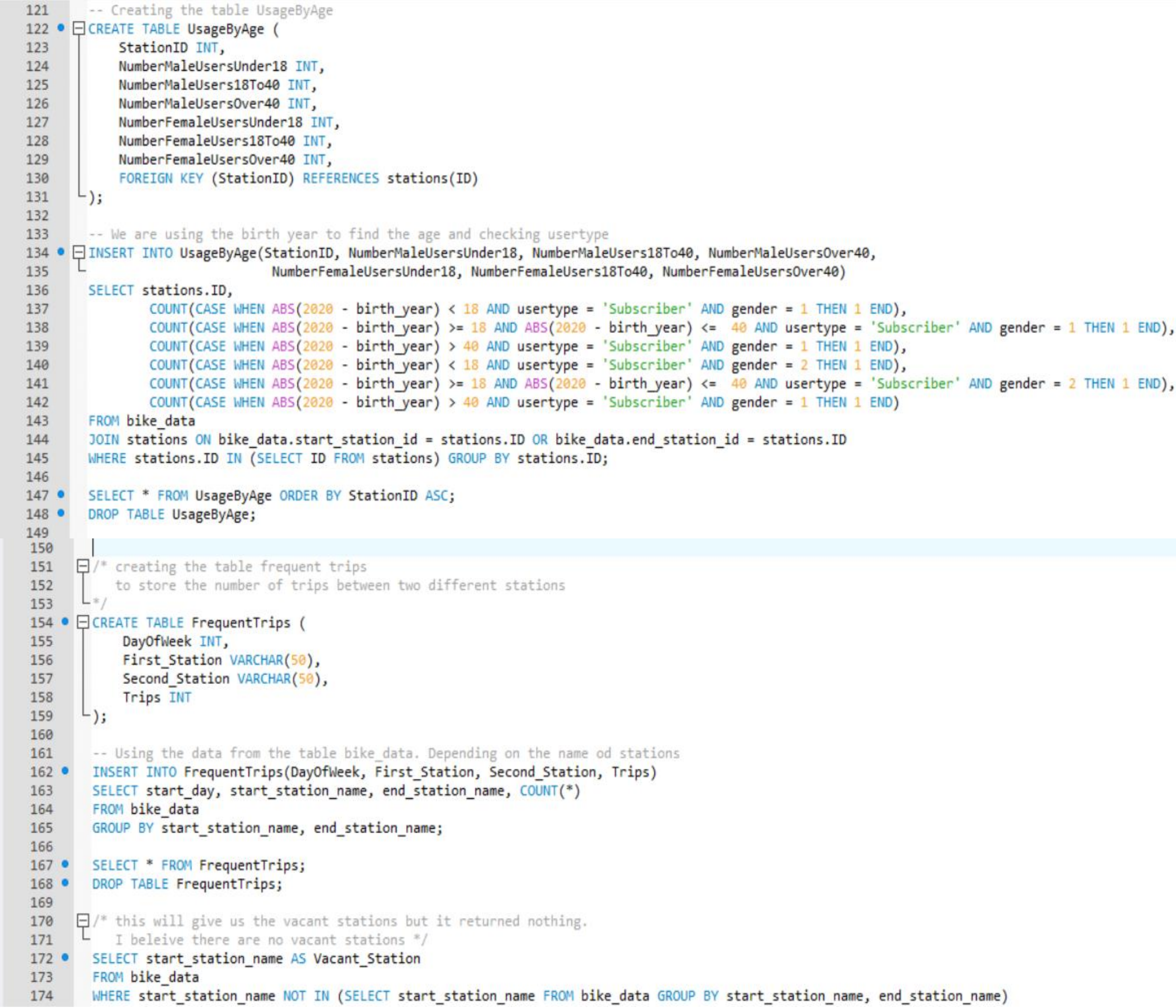
Code: CitiBike.sql



```sql
-- The imported data from the csv file contained bike_table
CREATE TABLE bike_data (
    trip_duraton INT,
    start_time VARCHAR(30),
    start_day DATE DEFAULT "0000-00-00",
    stop_time VARCHAR(30),
    stop_day DATE DEFAULT "0000-00-00",
    start_station_id INT,
    start_station_name VARCHAR(40),
    start_station_lattitude FLOAT,
    start_station_longitude FLOAT,
    end_station_id INT,
    end_station_name VARCHAR(40),
    end_station_lattitude FLOAT,
    end_station_longitude FLOAT,
    bike_id INT,
    usertype VARCHAR(20),
    birth_year VARCHAR(4),
    gender INT
);

-- I have altered parts of the table to make the data easier to use
ALTER TABLE bike_data MODIFY stop_day INTEGER;
UPDATE bike_data SET stop_day = DAYOFWEEK(stop_time);
UPDATE bike_data SET stop_time = STR_TO_DATE(stop_time, '%m/%d/%Y %T');
SELECT * FROM bike_data;

-- Table stations is created
CREATE TABLE stations (
    ID INT,
    Name VARCHAR(40),
    Lattitude FLOAT,
    Longitude FLOAT,
    FOREIGN KEY (ID) REFERENCES bike_data(start_station_id)
);

INSERT INTO stations(ID, Name, Lattitude, Longitude)
SELECT DISTINCT start_station_id, start_station_name,
                start_station_lattitude, start_station_longitude
FROM bike_data;

SELECT * FROM stations ORDER BY ID ASC;
DROP TABLE stations;

-- create the talbe trips
CREATE TABLE trips (
    StationID INT,
    MinTripDuration INT,
    MaxTripDuration INT,
    AvgTripDuration INT,
    NumberStartUsers INT,
    NumberReturnUsers INT,
    FOREIGN KEY (StationID) REFERENCES stations(ID)
);
-- finding the min, max and avg for each of the stationsID
INSERT INTO trips(StationID, MinTripDuration, MaxTripDuration,
                  AvgTripDuration, NumberStartUsers, NumberReturnUsers)
SELECT stations.ID, MIN(trip_duraton), MAX(trip_duraton), AVG(trip_duraton),
        COUNT(CASE WHEN usertype = 'Customer' THEN 1 END), -- Counting when condition met
        COUNT(CASE WHEN usertype = 'Subscriber' THEN 1 END)
FROM bike_data
JOIN stations ON bike_data.start_station_id = stations.ID OR bike_data.end_station_id = stations.ID
WHERE stations.ID IN (SELECT ID FROM stations) GROUP BY stations.ID;

SELECT * FROM trips ORDER BY StationID ASC;
DROP TABLE trips;
```



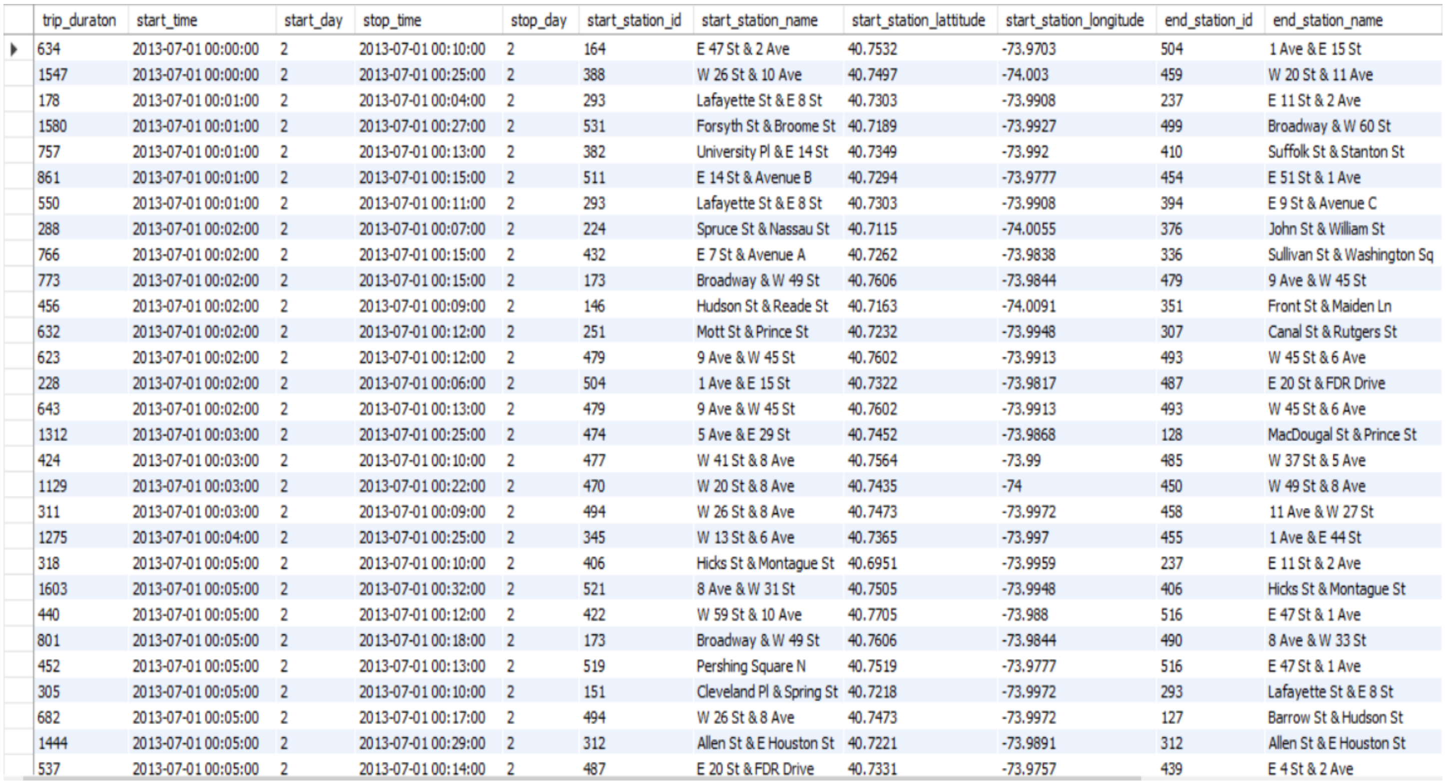
```sql

-- The table UsageByDay is created
CREATE TABLE UsageByDay (
    StationID INT,
    NumberWeekdayStartUsers INT,
    NumberWeekdayReturnUsers INT,
    NumberWeekendStartUsers INT,
    NumberWeekendReturnUsers INT,
    FOREIGN KEY (StationID) REFERENCEs stations(ID)
);

-- Counting for the number of users depending on the day and the usertype
INSERT INTO UsageByDay(StationID, NumberWeekdayStartUsers, NumberWeekdayReturnUsers,
                        NumberWeekendStartUsers, NumberWeekendReturnUsers)
SELECT stations.ID,
       COUNT(CASE WHEN (start_day >= 2 AND start_day <= 6) AND usertype = 'Customer' THEN 1 END),
       COUNT(CASE WHEN (start_day >= 2 AND start_day <= 6) AND usertype = 'Subscriber' THEN 1 END),
       COUNT(CASE WHEN (start_day = 1 OR start_day = 7) AND usertype = 'Customer' THEN 1 END),
       COUNT(CASE WHEN (start_day = 1 OR start_day = 7) AND usertype = 'Subscriber' THEN 1 END)
FROM bike_data
JOIN stations ON bike_data.start_station_id = stations.ID OR bike_data.end_station_id = stations.ID
WHERE stations.ID IN (SELECT ID FROM stations) GROUP BY stations.ID;

SELECT * FROM UsageByDay ORDER BY StationID ASC;
DROP TABLE UsageByDay;


-- the table UsageByGender is created
CREATE TABLE UsageByGender (
    StationID INT,
    NumberStartMaleUsers INT,
    NumberStartFemaleUsers INT,
    NumberReturnMaleUsers INT,
    NUmberReturnFemaleUsers INT,
    FOREIGN KEY (StationID) REFERENCES stations(ID)
);

-- counting the number of users by checking the gender and usertype
INSERT INTO UsageByGender(StationID, NumberStartMaleUsers, NumberStartFemaleUsers,
                            NumberReturnMaleUsers, NumberReturnFemaleUsers)
SELECT stations.ID,
       COUNT(CASE WHEN gender = 1 AND usertype = 'Customer' THEN 1 END),
       COUNT(CASE WHEN gender = 2 AND usertype = 'Customer' THEN 1 END),
       COUNT(CASE WHEN gender = 1 AND usertype = 'Subscriber' THEN 1 END),
       COUNT(CASE WHEN gender = 2 AND usertype = 'Subscriber' THEN 1 END)
FROM bike_data
JOIN stations ON bike_data.start_station_id = stations.ID OR bike_data.end_station_id = stations.ID
WHERE stations.ID IN (SELECT ID FROM stations) GROUP BY stations.ID;

SELECT * FROM UsageByGender ORDER BY StationID ASC;
DROP TABLE UsageByGender;


```



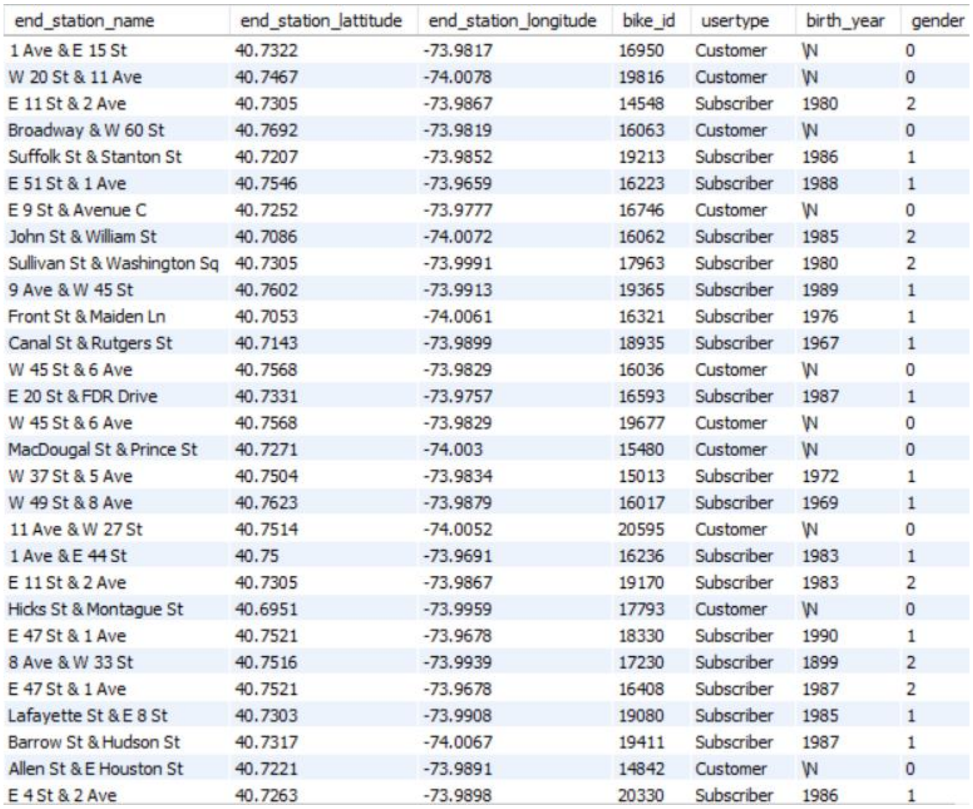
```sql
-- Creating the table UsageByAge
CREATE TABLE UsageByAge (
    StationID INT,
    NumberMaleUsersUnder18 INT,
    NumberMaleUsers18To40 INT,
    NumberMaleUsersOver40 INT,
    NumberFemaleUsersUnder18 INT,
    NumberFemaleUsers18To40 INT,
    NumberFemaleUsersOver40 INT,
    FOREIGN KEY (StationID) REFERENCES stations(ID)
);

-- We are using the birth year to find the age and checking usertype
INSERT INTO UsageByAge(StationID, NumberMaleUsersUnder18, NumberMaleUsers18To40, NumberMaleUsersOver40,
                        NumberFemaleUsersUnder18, NumberFemaleUsers18To40, NumberFemaleUsersOver40)
SELECT stations.ID,
        COUNT(CASE WHEN ABS(2020 - birth_year) < 18 AND usertype = 'Subscriber' AND gender = 1 THEN 1 END),
        COUNT(CASE WHEN ABS(2020 - birth_year) >= 18 AND ABS(2020 - birth_year) <=  40 AND usertype = 'Subscriber' AND gender = 1 THEN 1 END),
        COUNT(CASE WHEN ABS(2020 - birth_year) > 40 AND usertype = 'Subscriber' AND gender = 1 THEN 1 END),
        COUNT(CASE WHEN ABS(2020 - birth_year) < 18 AND usertype = 'Subscriber' AND gender = 2 THEN 1 END),
        COUNT(CASE WHEN ABS(2020 - birth_year) >= 18 AND ABS(2020 - birth_year) <=  40 AND usertype = 'Subscriber' AND gender = 2 THEN 1 END),
        COUNT(CASE WHEN ABS(2020 - birth_year) > 40 AND usertype = 'Subscriber' AND gender = 1 THEN 1 END)
FROM bike_data
JOIN stations ON bike_data.start_station_id = stations.ID OR bike_data.end_station_id = stations.ID
WHERE stations.ID IN (SELECT ID FROM stations) GROUP BY stations.ID;

SELECT * FROM UsageByAge ORDER BY StationID ASC;
DROP TABLE UsageByAge;


/* creating the table frequent trips
   to store the number of trips between two different stations
*/
CREATE TABLE FrequentTrips (
    DayOfWeek INT,
    First_Station VARCHAR(50),
    Second_Station VARCHAR(50),
    Trips INT
);

-- Using the data from the table bike_data. Depending on the name od stations
INSERT INTO FrequentTrips(DayOfWeek, First_Station, Second_Station, Trips)
SELECT start_day, start_station_name, end_station_name, COUNT(*)
FROM bike_data
GROUP BY start_station_name, end_station_name;

SELECT * FROM FrequentTrips;
DROP TABLE FrequentTrips;

/* this will give us the vacant stations but it returned nothing.
   I beleive there are no vacant stations */
SELECT start_station_name AS Vacant_Station
FROM bike_data
WHERE start_station_name NOT IN (SELECT start_station_name FROM bike_data GROUP BY start_station_name, end_station_name)
```

Output:

Table – bike_data

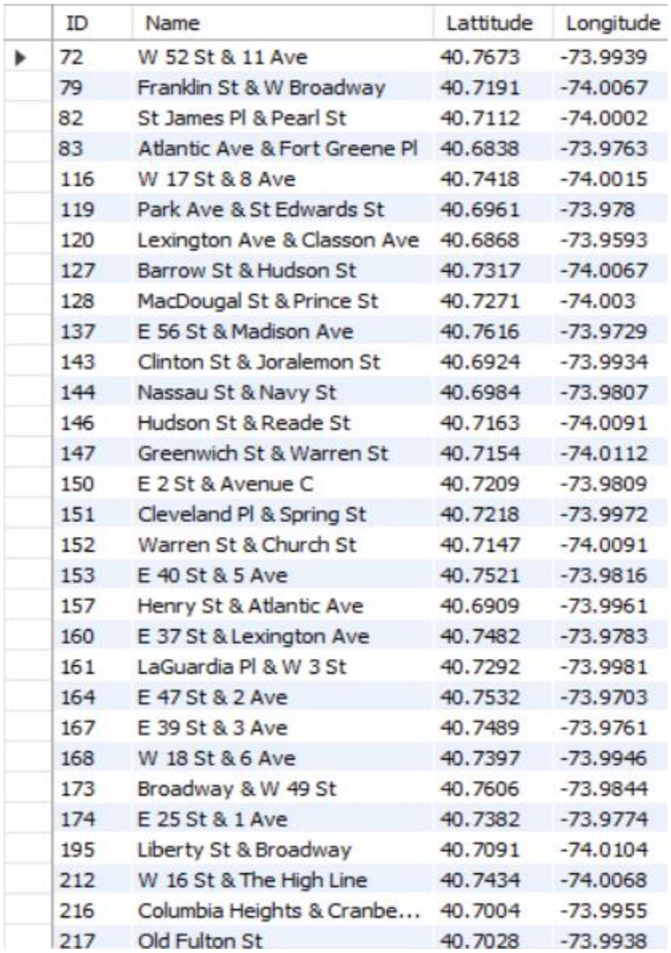


	trip_duraton	start_time	start_day	stop_time	stop_day	start_station_id	start_station_name	start_station_lattitude	start_station_longitude	end_station_id	end_station_name
▶	634	2013-07-01 00:00:00	2	2013-07-01 00:10:00	2	164	E 47 St & 2 Ave	40.7532	-73.9703	504	1 Ave & E 15 St
	1547	2013-07-01 00:00:00	2	2013-07-01 00:25:00	2	388	W 26 St & 10 Ave	40.7497	-74.003	459	W 20 St & 11 Ave
	178	2013-07-01 00:01:00	2	2013-07-01 00:04:00	2	293	Lafayette St & E 8 St	40.7303	-73.9908	237	E 11 St & 2 Ave
	1580	2013-07-01 00:01:00	2	2013-07-01 00:27:00	2	531	Forsyth St & Broome St	40.7189	-73.9927	499	Broadway & W 60 St
	757	2013-07-01 00:01:00	2	2013-07-01 00:13:00	2	382	University Pl & E 14 St	40.7349	-73.992	410	Suffolk St & Stanton St
	861	2013-07-01 00:01:00	2	2013-07-01 00:15:00	2	511	E 14 St & Avenue B	40.7294	-73.9777	454	E 51 St & 1 Ave
	550	2013-07-01 00:01:00	2	2013-07-01 00:11:00	2	293	Lafayette St & E 8 St	40.7303	-73.9908	394	E 9 St & Avenue C
	288	2013-07-01 00:02:00	2	2013-07-01 00:07:00	2	224	Spruce St & Nassau St	40.7115	-74.0055	376	John St & William St
	766	2013-07-01 00:02:00	2	2013-07-01 00:15:00	2	432	E 7 St & Avenue A	40.7262	-73.9838	336	Sullivan St & Washington Sq
	773	2013-07-01 00:02:00	2	2013-07-01 00:15:00	2	173	Broadway & W 49 St	40.7606	-73.9844	479	9 Ave & W 45 St
	456	2013-07-01 00:02:00	2	2013-07-01 00:09:00	2	146	Hudson St & Reade St	40.7163	-74.0091	351	Front St & Maiden Ln
	632	2013-07-01 00:02:00	2	2013-07-01 00:12:00	2	251	Mott St & Prince St	40.7232	-73.9948	307	Canal St & Rutgers St
	623	2013-07-01 00:02:00	2	2013-07-01 00:12:00	2	479	9 Ave & W 45 St	40.7602	-73.9913	493	W 45 St & 6 Ave
	228	2013-07-01 00:02:00	2	2013-07-01 00:06:00	2	504	1 Ave & E 15 St	40.7322	-73.9817	487	E 20 St & FDR Drive
	643	2013-07-01 00:02:00	2	2013-07-01 00:13:00	2	479	9 Ave & W 45 St	40.7602	-73.9913	493	W 45 St & 6 Ave
	1312	2013-07-01 00:03:00	2	2013-07-01 00:25:00	2	474	5 Ave & E 29 St	40.7452	-73.9868	128	MacDougal St & Prince St
	424	2013-07-01 00:03:00	2	2013-07-01 00:10:00	2	477	W 41 St & 8 Ave	40.7564	-73.99	485	W 37 St & 5 Ave
	1129	2013-07-01 00:03:00	2	2013-07-01 00:22:00	2	470	W 20 St & 8 Ave	40.7435	-74	450	W 49 St & 8 Ave
	311	2013-07-01 00:03:00	2	2013-07-01 00:09:00	2	494	W 26 St & 8 Ave	40.7473	-73.9972	458	11 Ave & W 27 St
	1275	2013-07-01 00:04:00	2	2013-07-01 00:25:00	2	345	W 13 St & 6 Ave	40.7365	-73.997	455	1 Ave & E 44 St
	318	2013-07-01 00:05:00	2	2013-07-01 00:10:00	2	406	Hicks St & Montague St	40.6951	-73.9959	237	E 11 St & 2 Ave
	1603	2013-07-01 00:05:00	2	2013-07-01 00:32:00	2	521	8 Ave & W 31 St	40.7505	-73.9948	406	Hicks St & Montague St
	440	2013-07-01 00:05:00	2	2013-07-01 00:12:00	2	422	W 59 St & 10 Ave	40.7705	-73.988	516	E 47 St & 1 Ave
	801	2013-07-01 00:05:00	2	2013-07-01 00:18:00	2	173	Broadway & W 49 St	40.7606	-73.9844	490	8 Ave & W 33 St
	452	2013-07-01 00:05:00	2	2013-07-01 00:13:00	2	519	Pershing Square N	40.7519	-73.9777	516	E 47 St & 1 Ave
	305	2013-07-01 00:05:00	2	2013-07-01 00:10:00	2	151	Cleveland Pl & Spring St	40.7218	-73.9972	293	Lafayette St & E 8 St
	682	2013-07-01 00:05:00	2	2013-07-01 00:17:00	2	494	W 26 St & 8 Ave	40.7473	-73.9972	127	Barrow St & Hudson St
	1444	2013-07-01 00:05:00	2	2013-07-01 00:29:00	2	312	Allen St & E Houston St	40.7221	-73.9891	312	Allen St & E Houston St
	537	2013-07-01 00:05:00	2	2013-07-01 00:14:00	2	487	E 20 St & FDR Drive	40.7331	-73.9757	439	E 4 St & 2 Ave



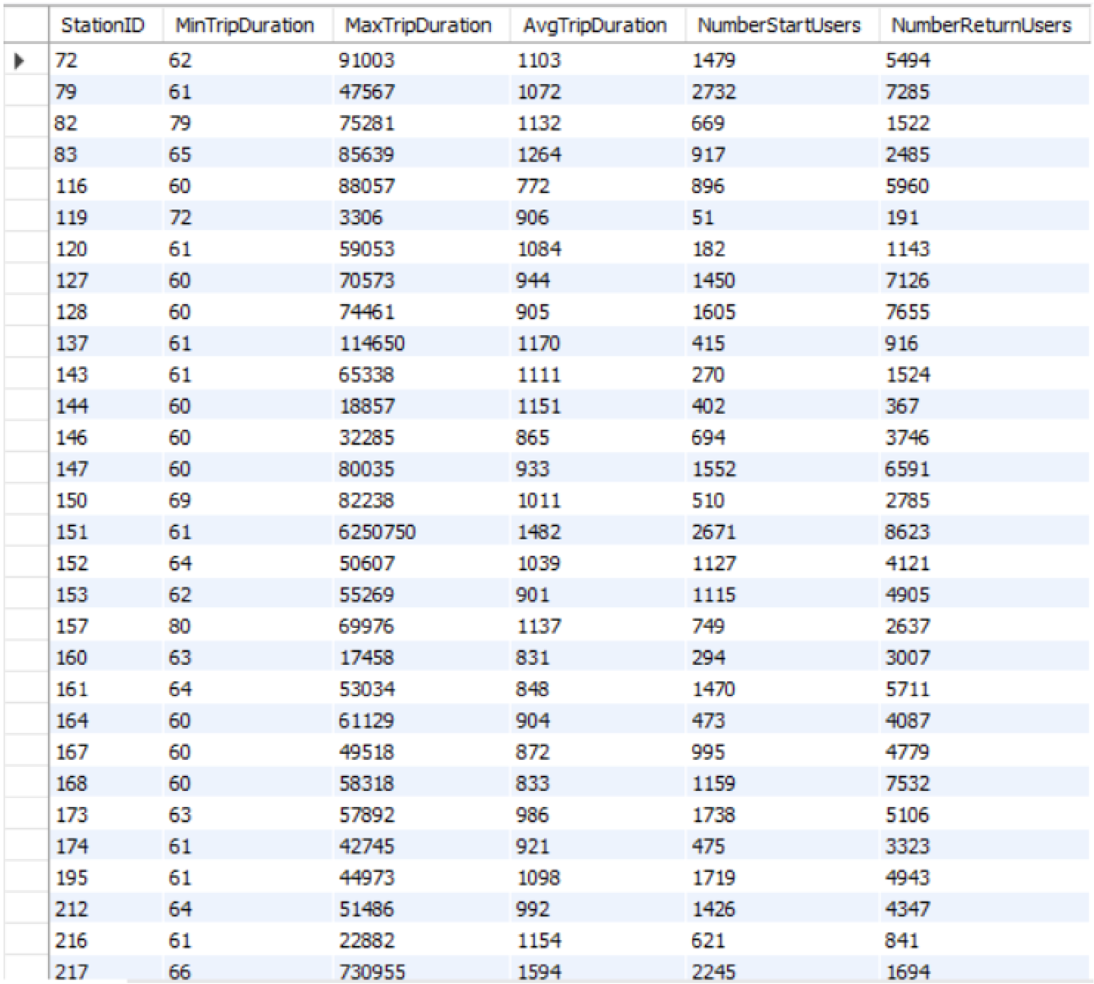
end_station_name	end_station_lattitude	end_station_longitude	bike_id	usertype	birth_year	gender
1 Ave & E 15 St	40.7322	-73.9817	16950	Customer	\N	0
W 20 St & 11 Ave	40.7467	-74.0078	19816	Customer	\N	0
E 11 St & 2 Ave	40.7305	-73.9867	14548	Subscriber	1980	2
Broadway & W 60 St	40.7692	-73.9819	16063	Customer	\N	0
Suffolk St & Stanton St	40.7207	-73.9852	19213	Subscriber	1986	1
E 51 St & 1 Ave	40.7546	-73.9659	16223	Subscriber	1988	1
E 9 St & Avenue C	40.7252	-73.9777	16746	Customer	\N	0
John St & William St	40.7086	-74.0072	16062	Subscriber	1985	2
Sullivan St & Washington Sq	40.7305	-73.9991	17963	Subscriber	1980	2
9 Ave & W 45 St	40.7602	-73.9913	19365	Subscriber	1989	1
Front St & Maiden Ln	40.7053	-74.0061	16321	Subscriber	1976	1
Canal St & Rutgers St	40.7143	-73.9899	18935	Subscriber	1967	1
W 45 St & 6 Ave	40.7568	-73.9829	16036	Customer	\N	0
E 20 St & FDR Drive	40.7331	-73.9757	16593	Subscriber	1987	1
W 45 St & 6 Ave	40.7568	-73.9829	19677	Customer	\N	0
MacDougal St & Prince St	40.7271	-74.003	15480	Customer	\N	0
W 37 St & 5 Ave	40.7504	-73.9834	15013	Subscriber	1972	1
W 49 St & 8 Ave	40.7623	-73.9879	16017	Subscriber	1969	1
11 Ave & W 27 St	40.7514	-74.0052	20595	Customer	\N	0
1 Ave & E 44 St	40.75	-73.9691	16236	Subscriber	1983	1
E 11 St & 2 Ave	40.7305	-73.9867	19170	Subscriber	1983	2
Hicks St & Montague St	40.6951	-73.9959	17793	Customer	\N	0
E 47 St & 1 Ave	40.7521	-73.9678	18330	Subscriber	1990	1
8 Ave & W 33 St	40.7516	-73.9939	17230	Subscriber	1899	2
E 47 St & 1 Ave	40.7521	-73.9678	16408	Subscriber	1987	2
Lafayette St & E 8 St	40.7303	-73.9908	19080	Subscriber	1985	1
Barrow St & Hudson St	40.7317	-74.0067	19411	Subscriber	1987	1
Allen St & E Houston St	40.7221	-73.9891	14842	Customer	\N	0
E 4 St & 2 Ave	40.7263	-73.9898	20330	Subscriber	1986	1

Table – Stations



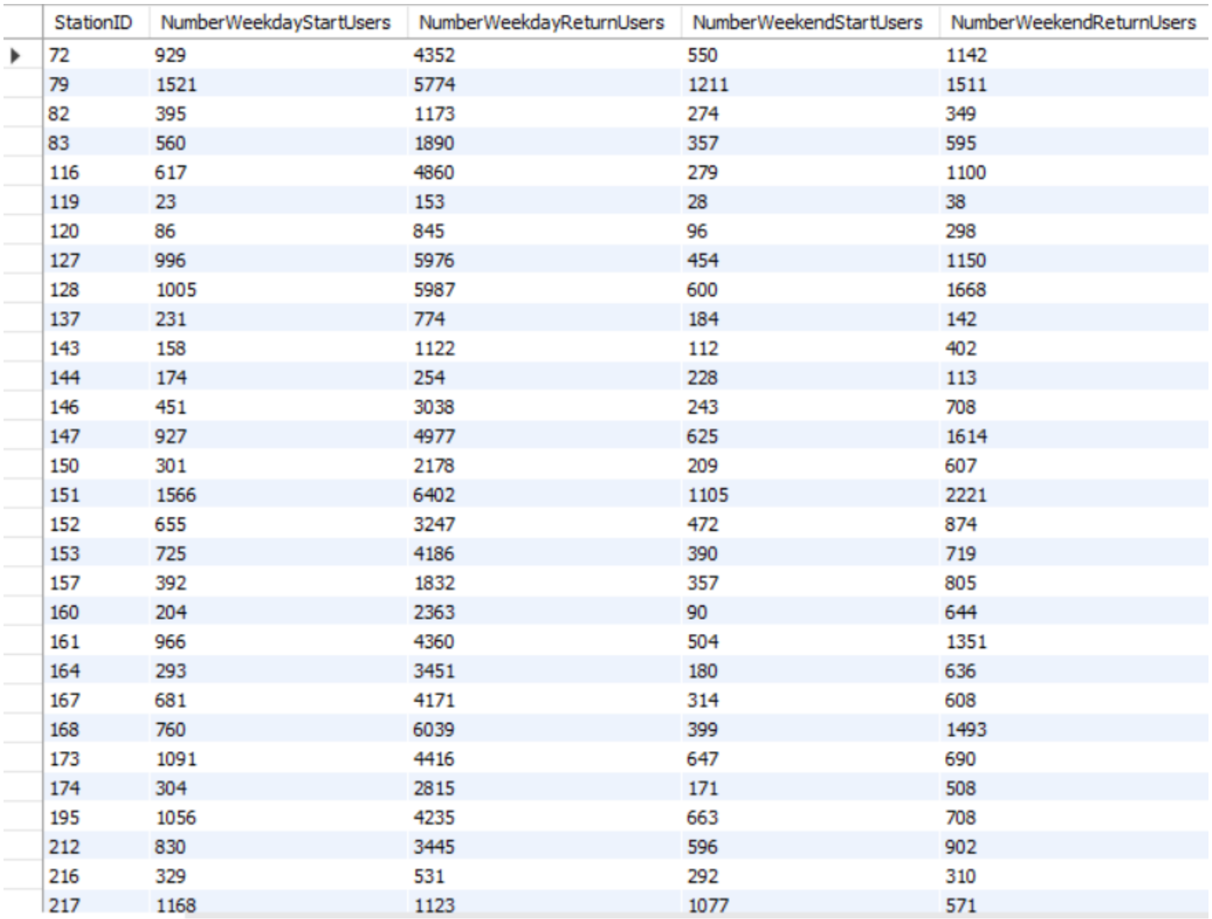
	ID	Name	Lattitude	Longitude
▶	72	W 52 St & 11 Ave	40.7673	-73.9939
	79	Franklin St & W Broadway	40.7191	-74.0067
	82	St James Pl & Pearl St	40.7112	-74.0002
	83	Atlantic Ave & Fort Greene Pl	40.6838	-73.9763
	116	W 17 St & 8 Ave	40.7418	-74.0015
	119	Park Ave & St Edwards St	40.6961	-73.978
	120	Lexington Ave & Classon Ave	40.6868	-73.9593
	127	Barrow St & Hudson St	40.7317	-74.0067
	128	MacDougal St & Prince St	40.7271	-74.003
	137	E 56 St & Madison Ave	40.7616	-73.9729
	143	Clinton St & Joralemon St	40.6924	-73.9934
	144	Nassau St & Navy St	40.6984	-73.9807
	146	Hudson St & Reade St	40.7163	-74.0091
	147	Greenwich St & Warren St	40.7154	-74.0112
	150	E 2 St & Avenue C	40.7209	-73.9809
	151	Cleveland Pl & Spring St	40.7218	-73.9972
	152	Warren St & Church St	40.7147	-74.0091
	153	E 40 St & 5 Ave	40.7521	-73.9816
	157	Henry St & Atlantic Ave	40.6909	-73.9961
	160	E 37 St & Lexington Ave	40.7482	-73.9783
	161	LaGuardia Pl & W 3 St	40.7292	-73.9981
	164	E 47 St & 2 Ave	40.7532	-73.9703
	167	E 39 St & 3 Ave	40.7489	-73.9761
	168	W 18 St & 6 Ave	40.7397	-73.9946
	173	Broadway & W 49 St	40.7606	-73.9844
	174	E 25 St & 1 Ave	40.7382	-73.9774
	195	Liberty St & Broadway	40.7091	-74.0104
	212	W 16 St & The High Line	40.7434	-74.0068
	216	Columbia Heights & Cranbe…	40.7004	-73.9955
	217	Old Fulton St	40.7028	-73.9938

Table – Trips



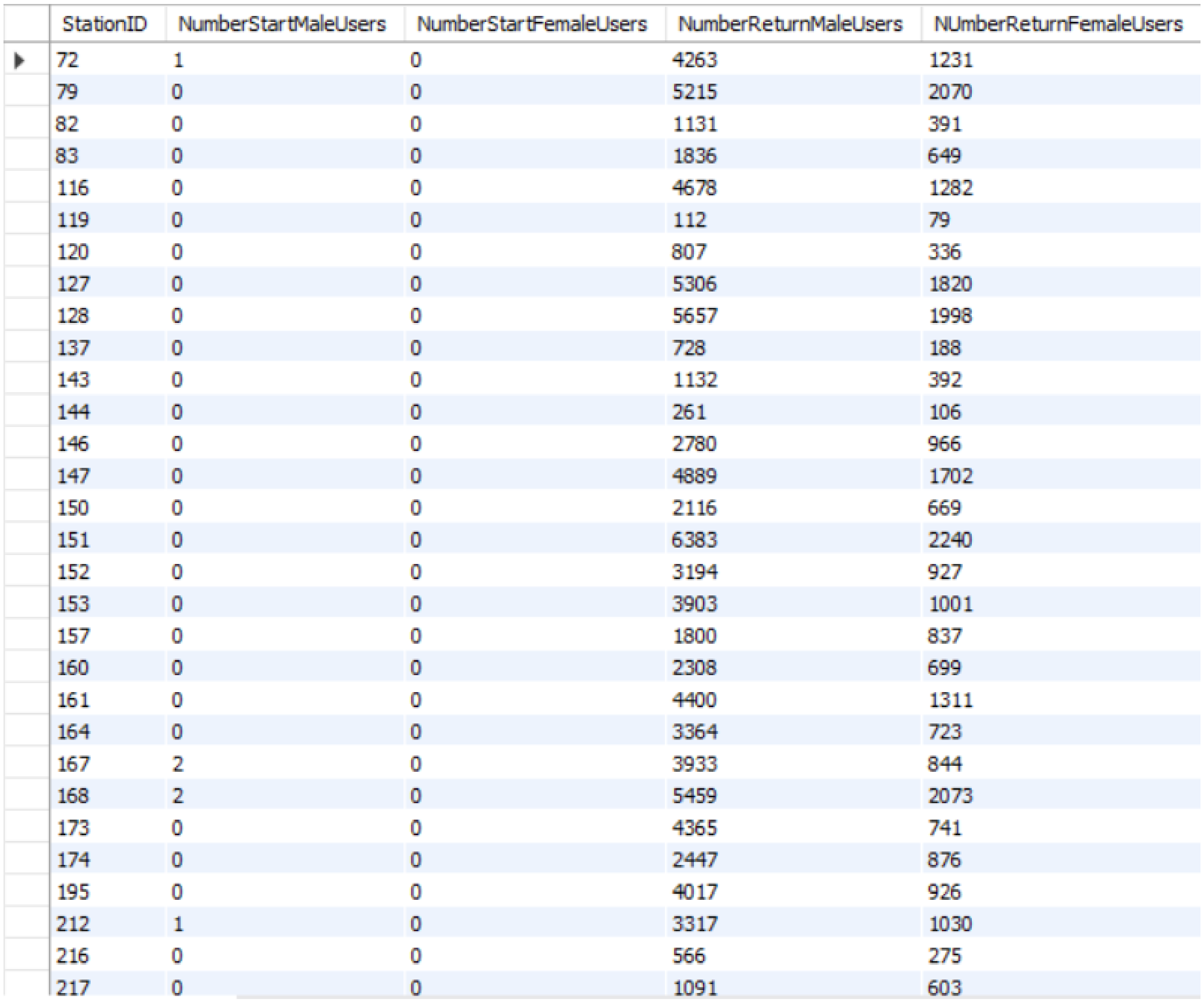
StationID	MinTripDuration	MaxTripDuration	AvgTripDuration	NumberStartUsers	NumberReturnUsers
72	62	91003	1103	1479	5494
79	61	47567	1072	2732	7285
82	79	75281	1132	669	1522
83	65	85639	1264	917	2485
116	60	88057	772	896	5960
119	72	3306	906	51	191
120	61	59053	1084	182	1143
127	60	70573	944	1450	7126
128	60	74461	905	1605	7655
137	61	114650	1170	415	916
143	61	65338	1111	270	1524
144	60	18857	1151	402	367
146	60	32285	865	694	3746
147	60	80035	933	1552	6591
150	69	82238	1011	510	2785
151	61	6250750	1482	2671	8623
152	64	50607	1039	1127	4121
153	62	55269	901	1115	4905
157	80	69976	1137	749	2637
160	63	17458	831	294	3007
161	64	53034	848	1470	5711
164	60	61129	904	473	4087
167	60	49518	872	995	4779
168	60	58318	833	1159	7532
173	63	57892	986	1738	5106
174	61	42745	921	475	3323
195	61	44973	1098	1719	4943
212	64	51486	992	1426	4347
216	61	22882	1154	621	841
217	66	730955	1594	2245	1694

Table – UsageByDay



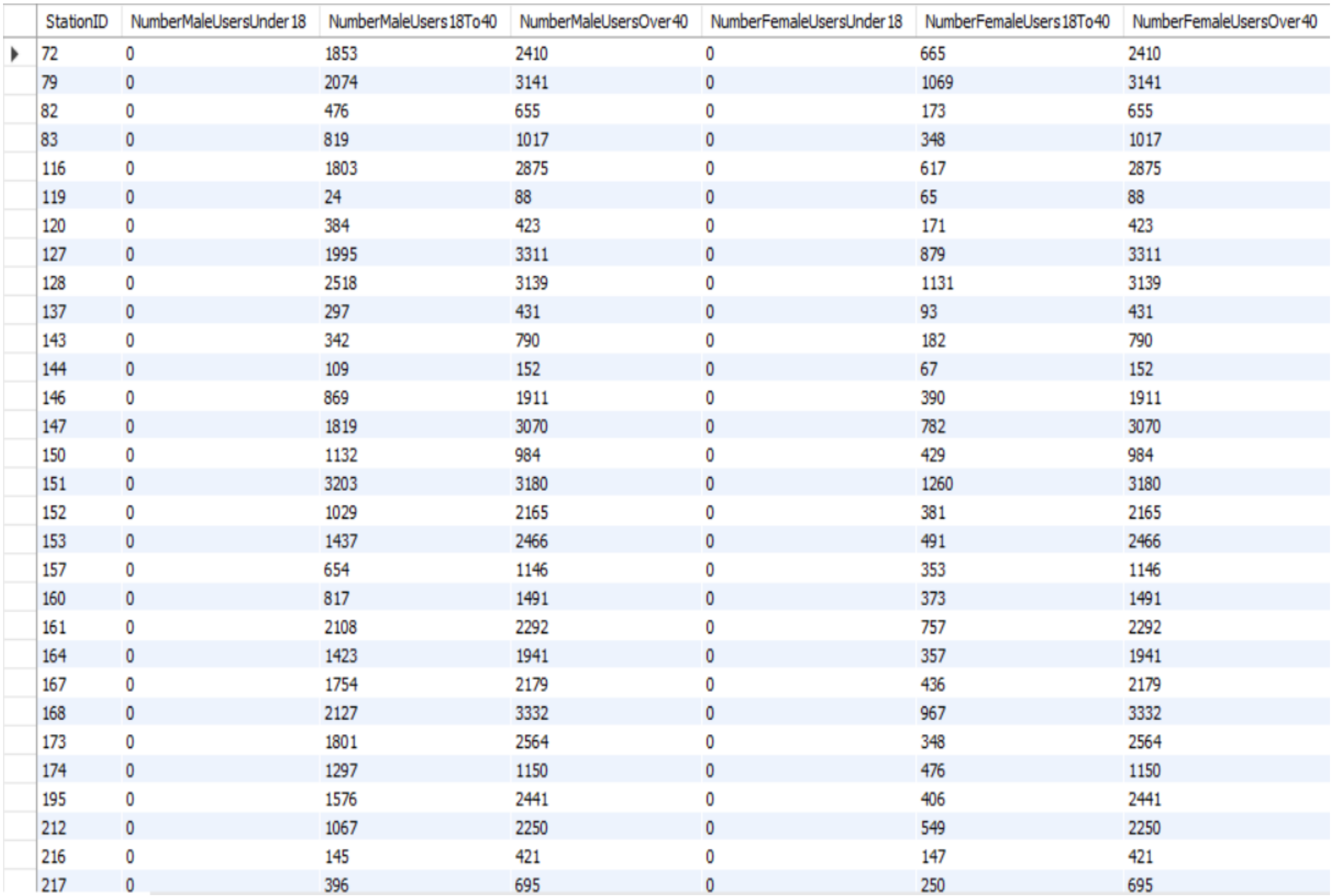
StationID	NumberWeekdayStartUsers	NumberWeekdayReturnUsers	NumberWeekendStartUsers	NumberWeekendReturnUsers
72	929	4352	550	1142
79	1521	5774	1211	1511
82	395	1173	274	349
83	560	1890	357	595
116	617	4860	279	1100
119	23	153	28	38
120	86	845	96	298
127	996	5976	454	1150
128	1005	5987	600	1668
137	231	774	184	142
143	158	1122	112	402
144	174	254	228	113
146	451	3038	243	708
147	927	4977	625	1614
150	301	2178	209	607
151	1566	6402	1105	2221
152	655	3247	472	874
153	725	4186	390	719
157	392	1832	357	805
160	204	2363	90	644
161	966	4360	504	1351
164	293	3451	180	636
167	681	4171	314	608
168	760	6039	399	1493
173	1091	4416	647	690
174	304	2815	171	508
195	1056	4235	663	708
212	830	3445	596	902
216	329	531	292	310
217	1168	1123	1077	571

Table – UsageByGender



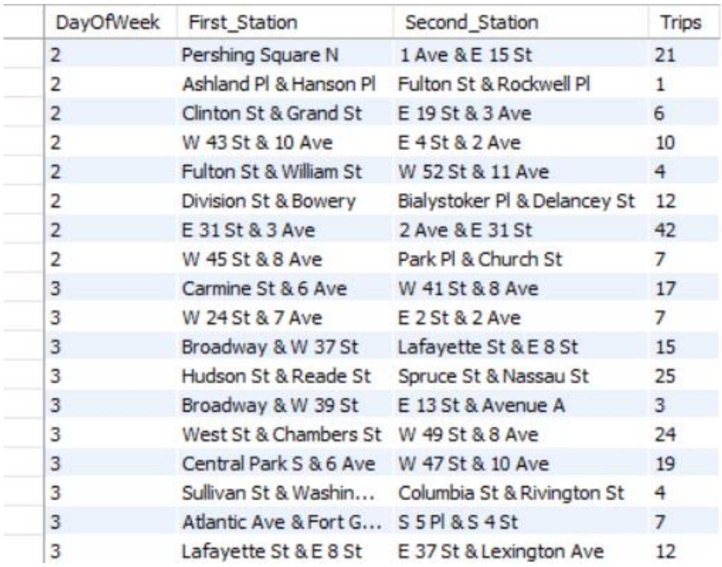
StationID	NumberStartMaleUsers	NumberStartFemaleUsers	NumberReturnMaleUsers	NUmberReturnFemaleUsers
72	1	0	4263	1231
79	0	0	5215	2070
82	0	0	1131	391
83	0	0	1836	649
116	0	0	4678	1282
119	0	0	112	79
120	0	0	807	336
127	0	0	5306	1820
128	0	0	5657	1998
137	0	0	728	188
143	0	0	1132	392
144	0	0	261	106
146	0	0	2780	966
147	0	0	4889	1702
150	0	0	2116	669
151	0	0	6383	2240
152	0	0	3194	927
153	0	0	3903	1001
157	0	0	1800	837
160	0	0	2308	699
161	0	0	4400	1311
164	0	0	3364	723
167	2	0	3933	844
168	2	0	5459	2073
173	0	0	4365	741
174	0	0	2447	876
195	0	0	4017	926
212	1	0	3317	1030
216	0	0	566	275
217	0	0	1091	603

Table – UsageByAge

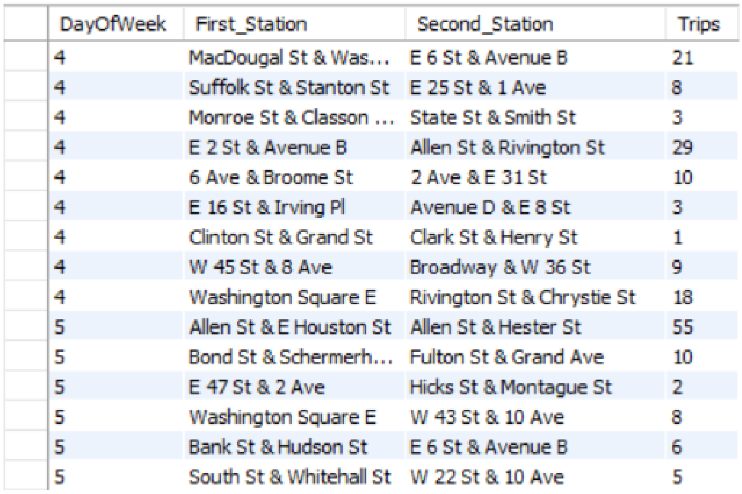


StationID	NumberMaleUsersUnder18	NumberMaleUsers18To40	NumberMaleUsersOver40	NumberFemaleUsersUnder18	NumberFemaleUsers18To40	NumberFemaleUsersOver40
72	0	1853	2410	0	665	2410
79	0	2074	3141	0	1069	3141
82	0	476	655	0	173	655
83	0	819	1017	0	348	1017
116	0	1803	2875	0	617	2875
119	0	24	88	0	65	88
120	0	384	423	0	171	423
127	0	1995	3311	0	879	3311
128	0	2518	3139	0	1131	3139
137	0	297	431	0	93	431
143	0	342	790	0	182	790
144	0	109	152	0	67	152
146	0	869	1911	0	390	1911
147	0	1819	3070	0	782	3070
150	0	1132	984	0	429	984
151	0	3203	3180	0	1260	3180
152	0	1029	2165	0	381	2165
153	0	1437	2466	0	491	2466
157	0	654	1146	0	353	1146
160	0	817	1491	0	373	1491
161	0	2108	2292	0	757	2292
164	0	1423	1941	0	357	1941
167	0	1754	2179	0	436	2179
168	0	2127	3332	0	967	3332
173	0	1801	2564	0	348	2564
174	0	1297	1150	0	476	1150
195	0	1576	2441	0	406	2441
212	0	1067	2250	0	549	2250
216	0	145	421	0	147	421
217	0	396	695	0	250	695

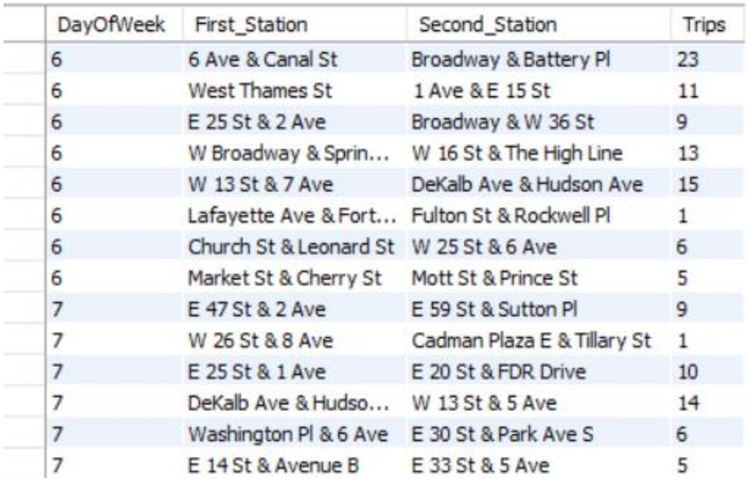
Table – FrequentTrips



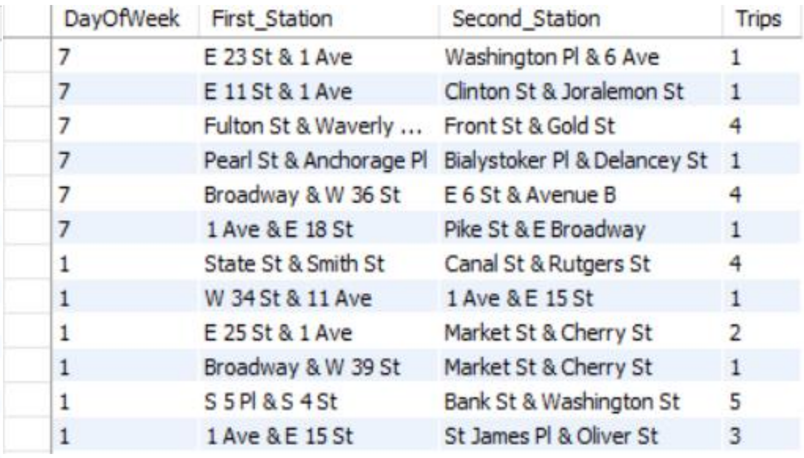
DayOfWeek	First_Station	Second_Station	Trips
2	Pershing Square N	1 Ave & E 15 St	21
2	Ashland Pl & Hanson Pl	Fulton St & Rockwell Pl	1
2	Clinton St & Grand St	E 19 St & 3 Ave	6
2	W 43 St & 10 Ave	E 4 St & 2 Ave	10
2	Fulton St & William St	W 52 St & 11 Ave	4
2	Division St & Bowery	Bialystoker Pl & Delancey St	12
2	E 31 St & 3 Ave	2 Ave & E 31 St	42
2	W 45 St & 8 Ave	Park Pl & Church St	7
3	Carmine St & 6 Ave	W 41 St & 8 Ave	17
3	W 24 St & 7 Ave	E 2 St & 2 Ave	7
3	Broadway & W 37 St	Lafayette St & E 8 St	15
3	Hudson St & Reade St	Spruce St & Nassau St	25
3	Broadway & W 39 St	E 13 St & Avenue A	3
3	West St & Chambers St	W 49 St & 8 Ave	24
3	Central Park S & 6 Ave	W 47 St & 10 Ave	19
3	Sullivan St & Washin...	Columbia St & Rivington St	4
3	Atlantic Ave & Fort G...	S 5 Pl & S 4 St	7
3	Lafayette St & E 8 St	E 37 St & Lexington Ave	12



DayOfWeek	First_Station	Second_Station	Trips
4	MacDougal St & Was...	E 6 St & Avenue B	21
4	Suffolk St & Stanton St	E 25 St & 1 Ave	8
4	Monroe St & Classon ...	State St & Smith St	3
4	E 2 St & Avenue B	Allen St & Rivington St	29
4	6 Ave & Broome St	2 Ave & E 31 St	10
4	E 16 St & Irving Pl	Avenue D & E 8 St	3
4	Clinton St & Grand St	Clark St & Henry St	1
4	W 45 St & 8 Ave	Broadway & W 36 St	9
4	Washington Square E	Rivington St & Chrystie St	18
5	Allen St & E Houston St	Allen St & Hester St	55
5	Bond St & Schermerh...	Fulton St & Grand Ave	10
5	E 47 St & 2 Ave	Hicks St & Montague St	2
5	Washington Square E	W 43 St & 10 Ave	8
5	Bank St & Hudson St	E 6 St & Avenue B	6
5	South St & Whitehall St	W 22 St & 10 Ave	5

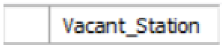


DayOfWeek	First_Station	Second_Station	Trips
6	6 Ave & Canal St	Broadway & Battery Pl	23
6	West Thames St	1 Ave & E 15 St	11
6	E 25 St & 2 Ave	Broadway & W 36 St	9
6	W Broadway & Sprin...	W 16 St & The High Line	13
6	W 13 St & 7 Ave	DeKalb Ave & Hudson Ave	15
6	Lafayette Ave & Fort...	Fulton St & Rockwell Pl	1
6	Church St & Leonard St	W 25 St & 6 Ave	6
6	Market St & Cherry St	Mott St & Prince St	5
7	E 47 St & 2 Ave	E 59 St & Sutton Pl	9
7	W 26 St & 8 Ave	Cadman Plaza E & Tillary St	1
7	E 25 St & 1 Ave	E 20 St & FDR Drive	10
7	DeKalb Ave & Hudso...	W 13 St & 5 Ave	14
7	Washington Pl & 6 Ave	E 30 St & Park Ave S	6
7	E 14 St & Avenue B	E 33 St & 5 Ave	5



DayOfWeek	First_Station	Second_Station	Trips
7	E 23 St & 1 Ave	Washington Pl & 6 Ave	1
7	E 11 St & 1 Ave	Clinton St & Joralemon St	1
7	Fulton St & Waverly ...	Front St & Gold St	4
7	Pearl St & Anchorage Pl	Bialystoker Pl & Delancey St	1
7	Broadway & W 36 St	E 6 St & Avenue B	4
7	1 Ave & E 18 St	Pike St & E Broadway	1
1	State St & Smith St	Canal St & Rutgers St	4
1	W 34 St & 11 Ave	1 Ave & E 15 St	1
1	E 25 St & 1 Ave	Market St & Cherry St	2
1	Broadway & W 39 St	Market St & Cherry St	1
1	S 5 Pl & S 4 St	Bank St & Washington St	5
1	1 Ave & E 15 St	St James Pl & Oliver St	3

Table – Vacant Stations



	Vacant_Station

I did not find any vacant station within my query I have tried others as well. I am concluding that there are no vacant stations within this database of CitiBike stations.