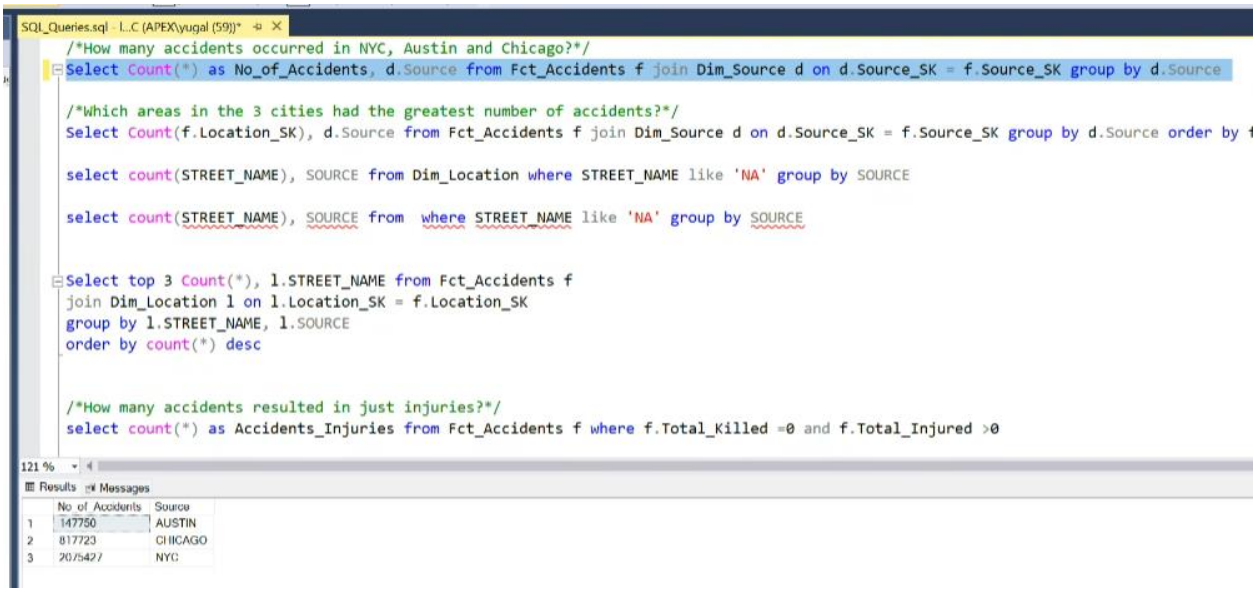
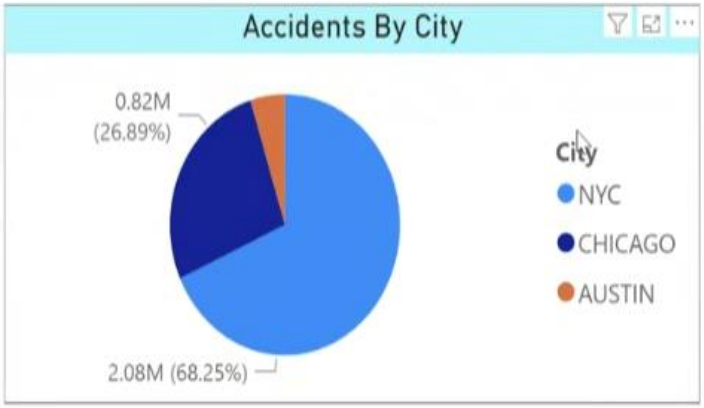
MOTOR VEHICLE COLLISION- SQL QUERIES for VISUALIZATION

1. How many accidents occurred in NYC, Austin, and Chicago?

SQL Query:-

```
SELECT COUNT (*) AS Number_of_Accidents, d.Source
FROM Fct_Accidents f
Join Dim_Source d ON d.Source_SK = f.Source_SK
GROUP BY d.Source;
```

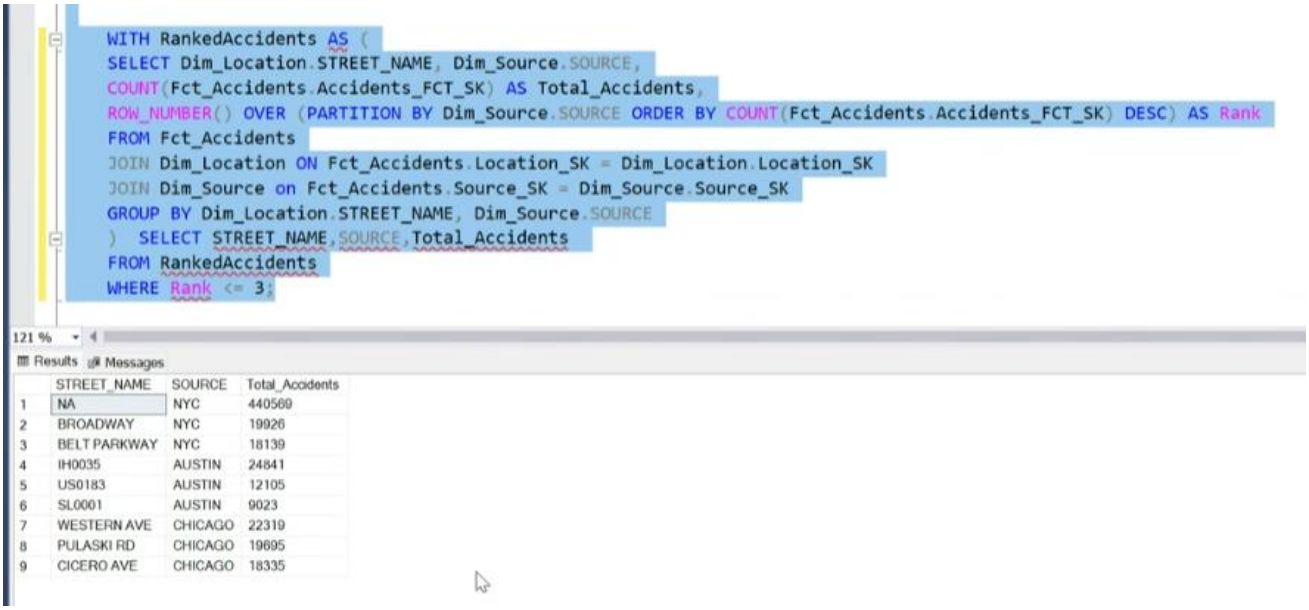




2. Which areas in the 3 cities had the greatest number of accidents? (Top 3 areas in each city).

SQL Query:-

```
WITH RankedAccidents AS (
  SELECT Dim_Location.STREET_NAME, Dim_Location.SOURCE,
        COUNT (Fct_Accidents.Accidents_FCT_SK) AS Total Accidents,
        ROW_NUMBER () OVER (PARTITION BY Dim_Location. SOURCE ORDER BY
        COUNT (Fct_Accidents.Accidents_FCT_SK) DESC) AS Rank
  FROM Fct_Accidents
  JOIN Dim_Location ON Fct_Accidents.Location_SK = Dim_Location.Location_SK
  GROUP BY Dim_Location. STREET_NAME, Dim_Location. SOURCE
        ) SELECT STREET_NAME, SOURCE, Total Accidents FROM RankedAccidents
        WHERE Rank <= 3;
```

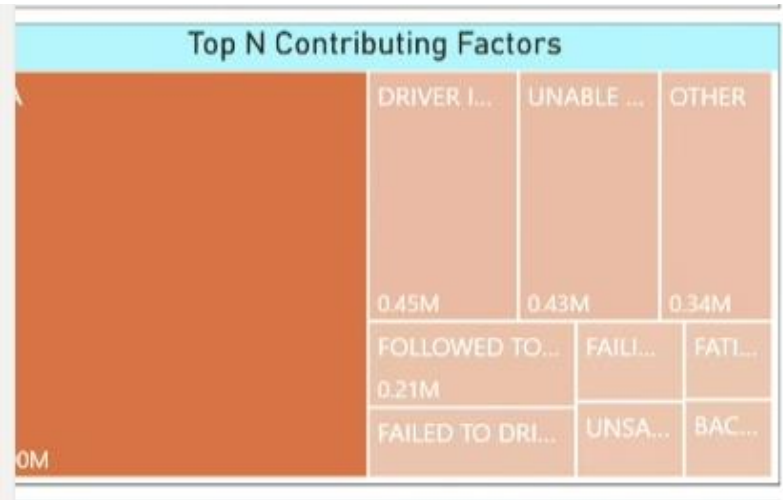


```
WITH RankedAccidents AS (
SELECT Dim_Location.STREET_NAME, Dim_Source.SOURCE,
COUNT(Fct_Accidents.Accidents_FCT_SK) AS Total_Accidents,
ROW_NUMBER() OVER (PARTITION BY Dim_Source.SOURCE ORDER BY COUNT(Fct_Accidents.Accidents_FCT_SK) DESC) AS Rank
FROM Fct_Accidents
JOIN Dim_Location ON Fct_Accidents.Location_SK = Dim_Location.Location_SK
JOIN Dim_Source on Fct_Accidents.Source_SK = Dim_Source.Source_SK
GROUP BY Dim_Location.STREET_NAME, Dim_Source.SOURCE
)  SELECT STREET_NAME,SOURCE,Total_Accidents
FROM RankedAccidents
WHERE Rank <= 3;
```

121 %

Results | Messages

	STREET_NAME	SOURCE	Total_Accidents
1	NA	NYC	440569
2	BROADWAY	NYC	19926
3	BELT PARKWAY	NYC	18139
4	IH0035	AUSTIN	24841
5	US0183	AUSTIN	12105
6	SL0001	AUSTIN	9023
7	WESTERN AVE	CHICAGO	22319
8	PULASKI RD	CHICAGO	19695
9	CICERO AVE	CHICAGO	18335



3. How many accidents resulted in just injuries?

- Overall

SQL Query:-

```
SELECT COUNT (*) AS Accidents_Injuries
FROM Fct_Accidents f
WHERE f.Total_Killed =0 and f.Total_Injured >0
```

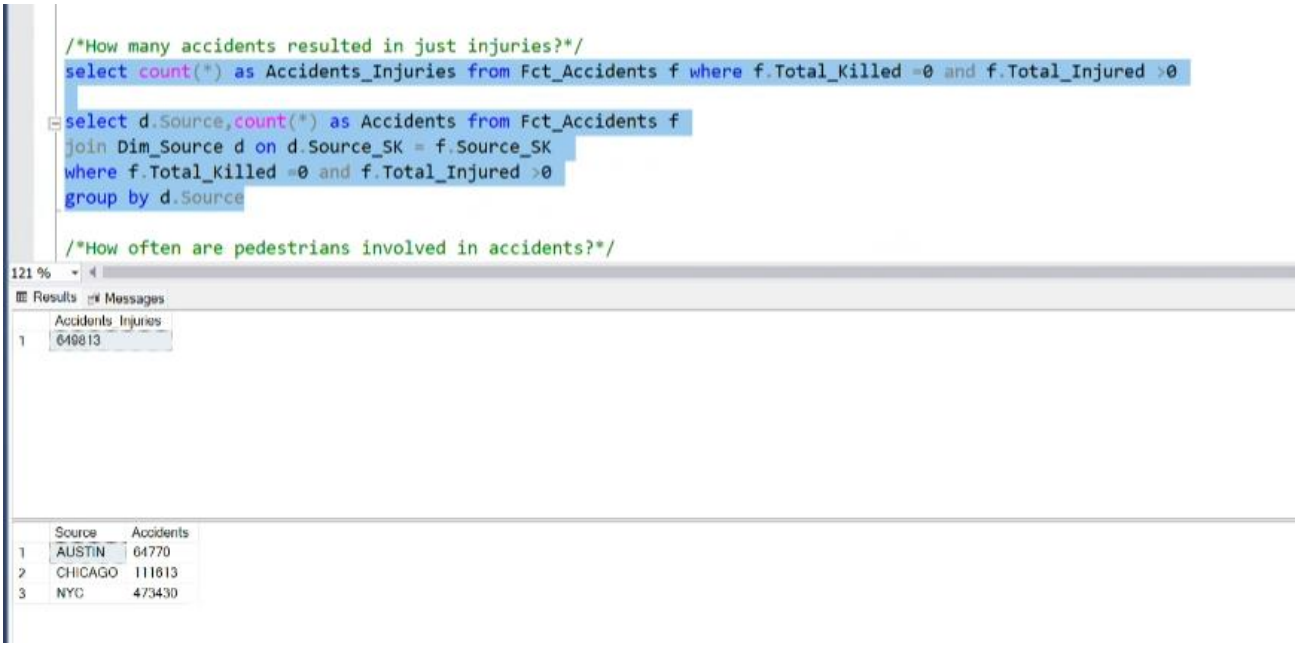
- By City

SQL Query:-

```
SELECT d.Source, COUNT (*) AS Accidents
FROM Fct_Accidents f
JOIN Dim_Source d ON d.Source_SK = f.Source_SK
WHERE f.Total_Killed =0 and f.Total_Injured >0
GROUP BY d.Source
```

OR

```
SELECT Source, City_Accidents_Injuries, Overall_Accidents_Injuries
FROM (
SELECT d.Source,
      COUNT (*) AS City_Accidents_Injuries,
      SUM (COUNT (*)) OVER () AS Overall_Accidents_Injuries
FROM Fct_Accidents f
JOIN Dim_Source d ON f.Source_SK = d.Source_SK
WHERE f.Total_Killed = 0 AND f.Total_Injured > 0
GROUP BY d.Source) AS Sub;
```



4. How often are pedestrians involved in accidents?

- Overall

  SQL Query:-

```
SELECT COUNT (*) AS Accidents_Pedestrians FROM Fct_Accidents f WHERE f.IS_PEDESTRIAN = 'Y';
```

- By City

  SQL Query:-

```
SELECT d.Source, COUNT (*) AS Accidents_Pedestrians
FROM Fct_Accidents f
JOIN Dim_Source d ON d.Source_SK = f.Source_SK
WHERE f.IS_PEDESTRIAN = 'Y'
GROUP BY d.Source
```

  OR

```
SELECT d.Source,
COUNT (*) AS Accidents_Pedestrians,
SUM (COUNT (*)) OVER () AS Total_Accidents_Pedestrians
FROM Fct_Accidents f
JOIN Dim_Source d ON f.Source_SK = d.Source_SK
WHERE f.IS_PEDESTRIAN = 'Y'
GROUP BY d.Source;
```

```sql
/*How often are pedestrians involved in accidents?*/
select count(*) as Accidents_Pedestrians from Fct_Accidents f where f.IS_PEDESTRIAN = 'Y';

select d.Source,count(*) as Accidents_Pedestrians from Fct_Accidents f
join Dim_Source d on d.Source_SK = f.Source_SK
where f.IS_PEDESTRIAN = 'Y'
group by d.Source

/* When do most accidents happen?
• seasonality report*/
```

121 %

Results Messages

	Accidents_Pedestrians
1	136496

	Source	Accidents_Pedestrians
1	AUSTIN	3505
2	CHICAGO	19085
3	NYC	113926

5. When do most accidents happen? (Seasonality Report)

SQL Query:-

```sql
SELECT d.Season, COUNT (*) AS No_of_Accidents FROM Fct_Accidents f
JOIN Dim_Date d ON f.Date_SK = d.Date_SK
GROUP BY d.Season
ORDER BY COUNT (*) DESC;
```

```sql
SELECT Season, No_of_Accidents,
       SUM (No_of_Accidents) OVER (ORDER BY No_of_Accidents DESC) AS Cumulative_Total,
       ROUND (100.0 * No_of_Accidents / SUM (No_of_Accidents) OVER (), 2) AS Percentage_of_Total
FROM (
  SELECT d.Season, COUNT (*) AS No_of_Accidents
  FROM Fct_Accidents f
  JOIN Dim_Date d ON f.Date_SK = d.Date_SK
  GROUP BY d.Season
) AS SeasonData
ORDER BY No_of_Accidents DESC;
```

```sql
/* When do most accidents happen?
• seasonality report*/
select d.Season,count(*) as No_of_Accidents from Fct_Accidents f
join Dim_Date d on f.Date_SK = d.Date_SK
group by d.Season
order by count(*) desc

/*Final Project Details
```

121 %

Results | Messages

	Season	No_of_Accidents
1	Fall	806512
2	Summer	784599
3	Winter	733507
4	Spring	716282

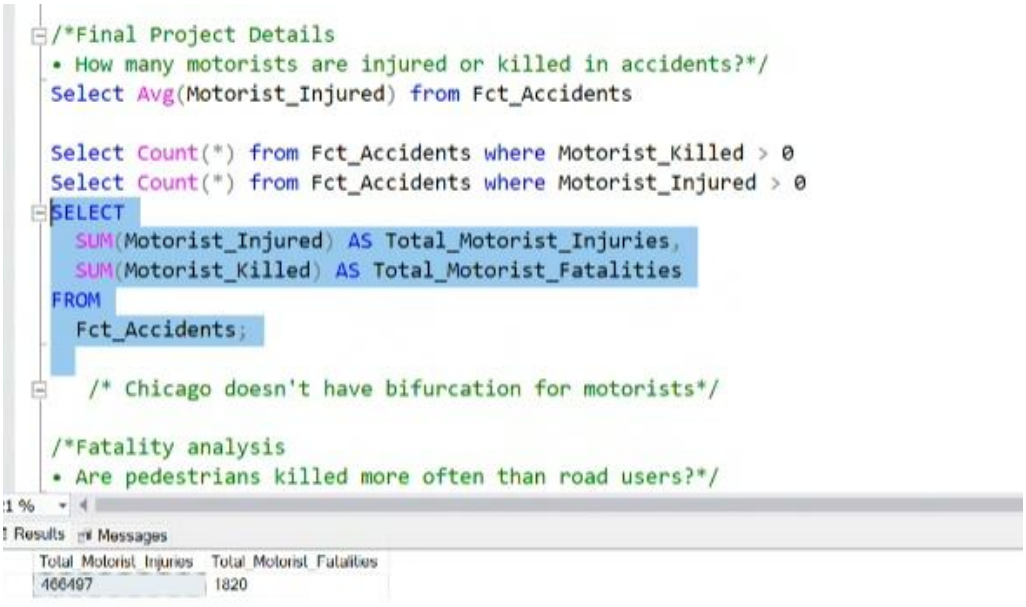
6. How many motorists are injured or killed in accidents?

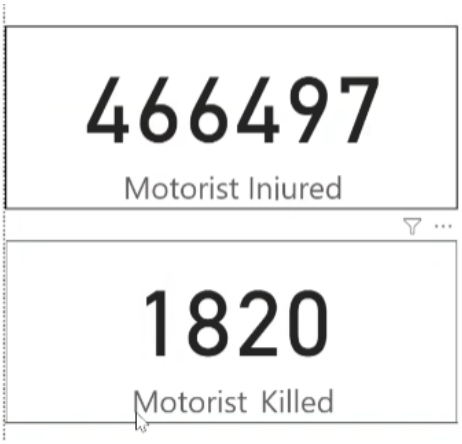
SQL Query:-

```
SELECT
  SUM (Motorist_Injured) AS Total_Motorist_Injuries,
  SUM (Motorist_Killed) AS Total_Motorist_Fatalities
FROM Fct_Accidents;

SELECT s.Source,
  SUM (Motorist_Injured) AS Total_Motorist_Injuries,
  SUM (Motorist_Killed) AS Total_Motorist_Fatalities
FROM Fct_Accidents f
JOIN Dim_Source s ON f.Source_SK = s.Source_SK
GROUP BY S.Source; /* Chicago doesn't have bifurcation for motorists*/

SELECT s.Source,
  SUM (f.Motorist_Injured) AS Total_Motorist_Injuries,
  SUM (f.Motorist_Killed) AS Total_Motorist_Fatalities,
  SUM (SUM (f.Motorist_Injured)) OVER () AS Overall_Motorist_Injuries,
  SUM (SUM (f.Motorist_Killed)) OVER () AS Overall_Motorist_Fatalities
FROM Fct_Accidents f
JOIN Dim_Source s ON f.Source_SK = s.Source_SK
GROUP BY s.Source
ORDER BY s.Source;
```





7. Which top 5 areas in 3 cities have the most fatal accidents?

SQL Query:-

```
SELECT top 5 COUNT (*), l.STREET_NAME, l.SOURCE FROM Fct_Accidents f
JOIN Dim_LocatiON l ON l.LocatiON_SK = f.LocatiON_SK
GROUP BY l.STREET_NAME, l.SOURCE
HAVING l.STREET_NAME NOT LIKE 'NA'
ORDER BY COUNT (*) DESC /*Given NYC's NA COUNT of street name is ignored*/
```

SQL Query:-

```
WITH RankedAccidents AS (
  SELECT Dim_LocatiON.STREET_NAME, Dim_Source.SOURCE,
        COUNT (Fct_Accidents.Accidents_FCT_SK) AS Total_Accidents,
        ROW_NUMBER () OVER (PARTITION BY Dim_Source.SOURCE
  ORDER BY COUNT (Fct_Accidents.Accidents_FCT_SK) DESC) AS Rank
  FROM Fct_Accidents
  JOIN Dim_LocatiON ON Fct_Accidents.LocatiON_SK = Dim_LocatiON.LocatiON_SK
        JOIN Dim_Source ON Fct_Accidents.Source_SK = Dim_Source.Source_SK
  GROUP BY Dim_LocatiON.STREET_NAME, Dim_Source.SOURCE
) SELECT STREET_NAME, SOURCE, Total_Accidents
  FROM RankedAccidents WHERE Rank <= 5;
```

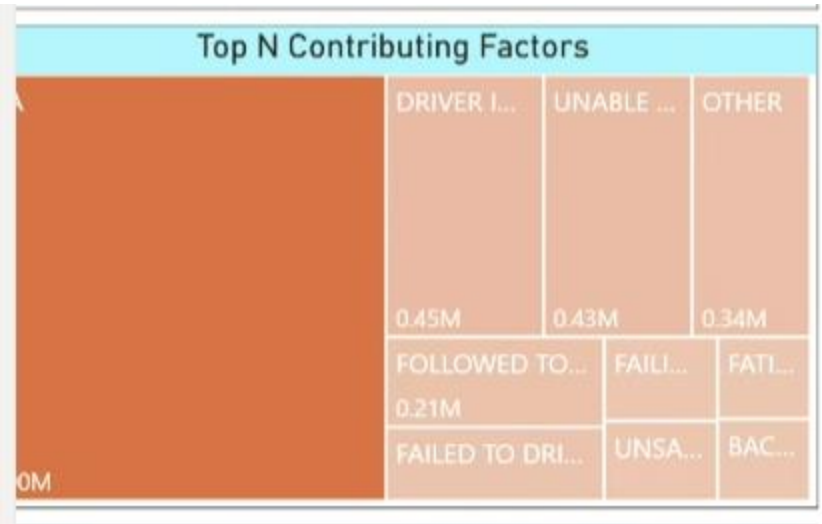
```sql
/*Which top 5 areas in 3 cities have the most fatal number of accidents?*/

WITH RankedAccidents AS (
SELECT Dim_Location.STREET_NAME, Dim_Source.SOURCE,
COUNT(Fct_Accidents.Accidents_FCT_SK) AS Total_Accidents,
ROW_NUMBER() OVER (PARTITION BY Dim_Source.SOURCE ORDER BY COUNT(Fct_Accidents.Accidents_FCT_SK) DESC) AS Rank
FROM Fct_Accidents
JOIN Dim_Location ON Fct_Accidents.Location_SK = Dim_Location.Location_SK
JOIN Dim_Source on Fct_Accidents.Source_SK = Dim_Source.Source_SK
GROUP BY Dim_Location.STREET_NAME, Dim_Source.SOURCE
) SELECT STREET_NAME,SOURCE,Total_Accidents
FROM RankedAccidents
WHERE Rank <= 5;
```

121 %

Results | Messages

	STREET_NAME	SOURCE	Total_Accidents
1	IH0035	AUSTIN	24841
2	US0183	AUSTIN	12105
3	SL0001	AUSTIN	9023
4	US0290	AUSTIN	5206
5	SH0071	AUSTIN	3790
6	NA	NYC	440569
7	BROADWAY	NYC	19926
8	BELT PARKWAY	NYC	18139
9	ATLANTIC AVENUE	NYC	17601
10	3 AVENUE	NYC	14107
11	WESTERN AVE	CHICAGO	22319
12	PULASKI RD	CHICAGO	19695
13	CICERO AVE	CHICAGO	18335
14	ASHLAND AVE	CHICAGO	17755
15	HALSTED ST	CHICAGO	15851



8. Time-based analysis of accidents (Time of the day, day of the week, weekdays or weekends).

➢ Day of the Week

```sql
SELECT d.Day, COUNT (*) AS No_of_Accidents
FROM Fct_Accidents f
JOIN Dim_Date d ON f.Date_SK = d.Date_SK
GROUP BY d.Day
ORDER BY No_of_Accidents;
```

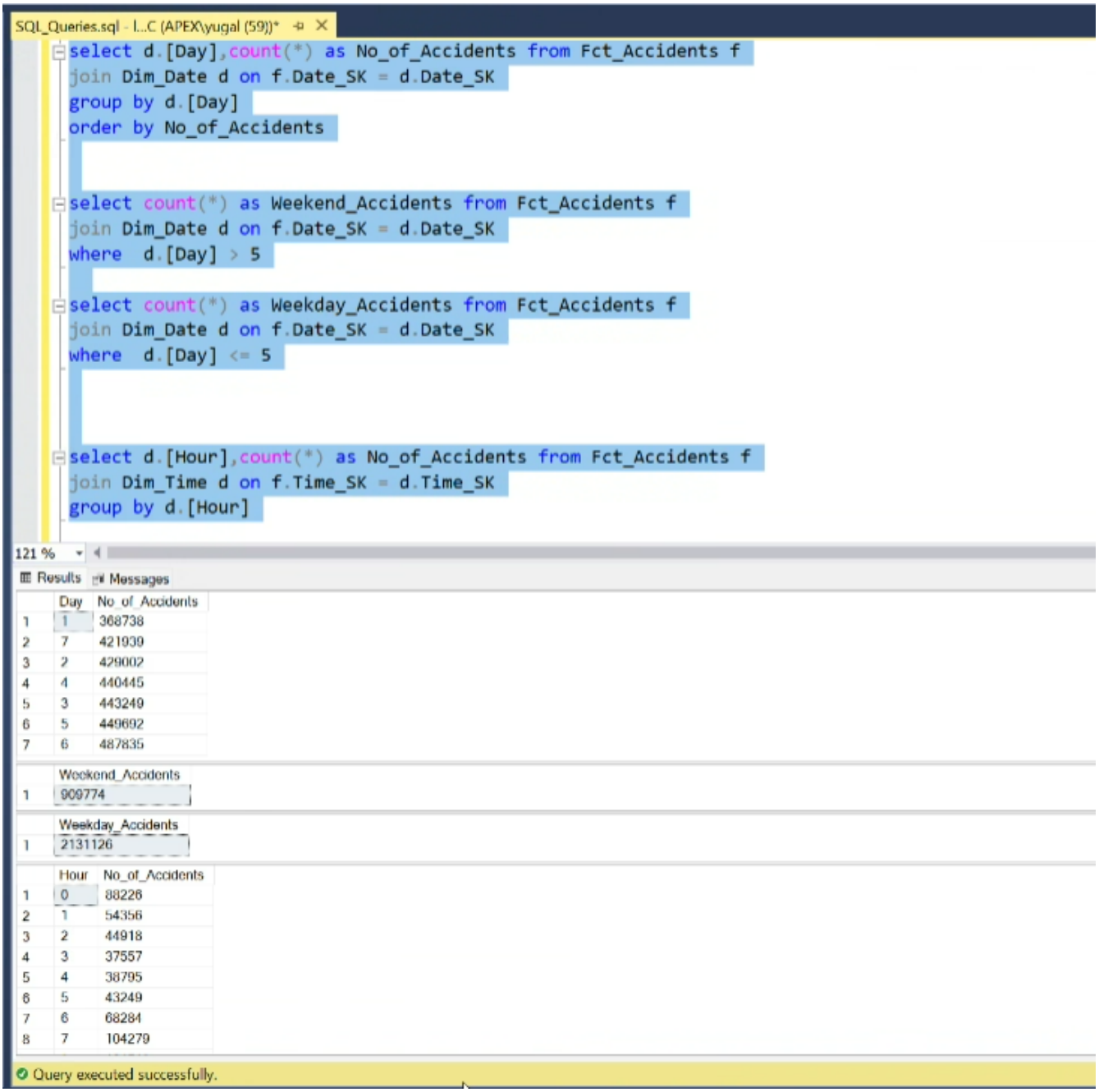
- Weekend vs. Weekday Accidents

```
-- Weekend Accidents

SELECT COUNT (*) AS Weekend_Accidents
FROM Fct_Accidents f
JOIN Dim_Date d ON f.Date_SK = d.Date_SK
WHERE d.Day > 5;
-- Weekday Accidents
SELECT COUNT (*) AS Weekday_Accidents
FROM Fct_Accidents f
JOIN Dim_Date d ON f.Date_SK = d.Date_SK
WHERE d.Day <= 5;
```

- Hour of the Day

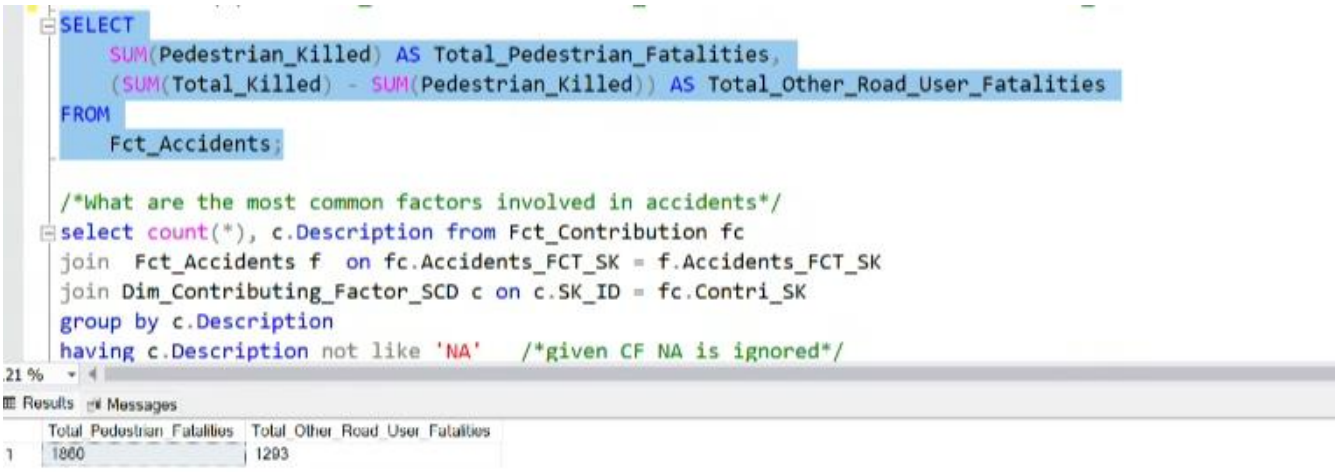
```
SELECT d.Hour, COUNT (*) AS No_of_Accidents
FROM Fct_Accidents f
JOIN Dim_Time d ON f.Time_SK = d.Time_SK
GROUP BY d.Hour
ORDER BY d.Hour;
```



USE FILTERS ON VISUALIZATION

9. Are pedestrians killed more often than road users? (Fatality analysis)

```
SELECT
    SUM (Pedestrian_Killed) AS Total_Pedestrian_Fatalities,
   (SUM (Total_Killed) – SUM (Pedestrian_Killed)) AS Total_Other_Road_User_Fatalities
FROM Fct_Accidents;
```



10. What are the most common factors involved in accidents?

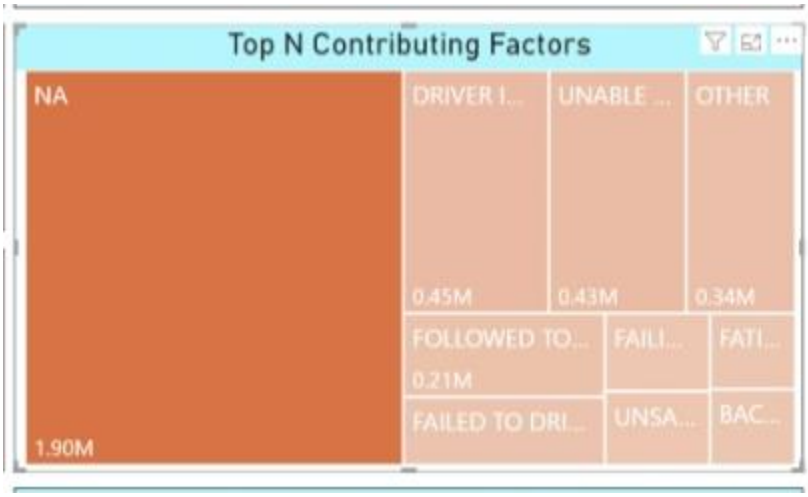
```
SELECT
      COUNT (*) Number, c.DescriptiON AS Most_Common_Factors FROM Fct_Contribution fc
JOIN Fct_Accidents f ON fc.Accidents_FCT_SK = f.Accidents_FCT_SK
JOIN Dim_Contributing_Factor_SCD c ON c.SK_ID = fc.Contri_SK
GROUP BY c.Description
ORDER BY COUNT (*) DESC;
```

```
select TOP 10 count(*), c.Description as Most_Common_Factors from Fct_Contribution fc
join  Fct_Accidents f  on fc.Accidents_FCT_SK = f.Accidents_FCT_SK
join Dim_Contributing_Factor_SCD c on c.SK_ID = fc.Contri_SK
group by c.Description
  /*Top 10*/
order by count(*) desc
```

121 %

Results | Messages

	(No column name)	Most_Common_Factors
1	1004529	NA
2	451447	DRIVER INATTENTION
3	425838	UNABLE TO DETERMINE
4	338755	OTHER
5	214886	FOLLOWED TOO CLOSELY
6	175177	FAILED TO DRIVE IN SINGLE LANE
7	104173	FAILING TO YIELD RIGHT-OF-WAY
8	98381	UNSAFE SPEED
9	83129	FATIGUED OR ASLEEP
10	82558	BACKED WITHOUT SAFETY



/* ADDITIONAL REQURIREMENT*/

(Using Austin and NYC datasets, Create a visualization to show the number of Accident that involved more than 2 vehicles. Show this data as a comparison between these 2 cities).

```
SELECT
   Count (Vehicle_Fct_Sk) AS Number_of_Vehicle, s.Source
        FROM Fct_Accidents a
        JOIN Fct_Vehicle f ON f.Accidents_FCT_SK = a.Accidents_FCT_SK
        JOIN Dim_Source s ON a.Source_SK = s.Source_SK
        WHERE f.Vehicle_Count >2
   GROUP BY s.Source
```

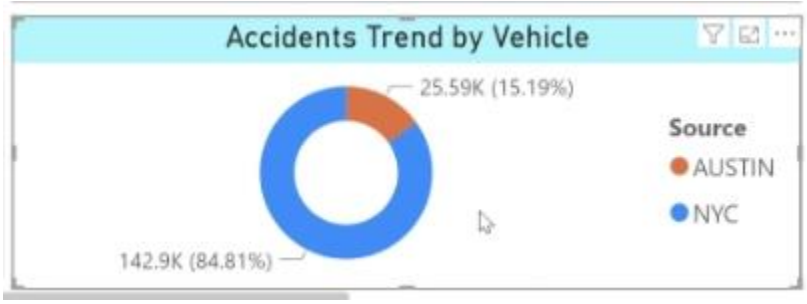
```sql
/*Accidents that involved more than 2 vehicles *Austin and NYC* */

Select Count(a.Accidents_FCT_SK)as No_Of_Accidents, s.Source from Fct_Accidents a join
   Fct_Vehicle f on f.Accidents_FCT_SK = a.Accidents_FCT_SK
   Join Dim_Source s on a.Source_SK = s.Source_SK
   where f.Vehicle_Count >2
       Group by s.Source
```

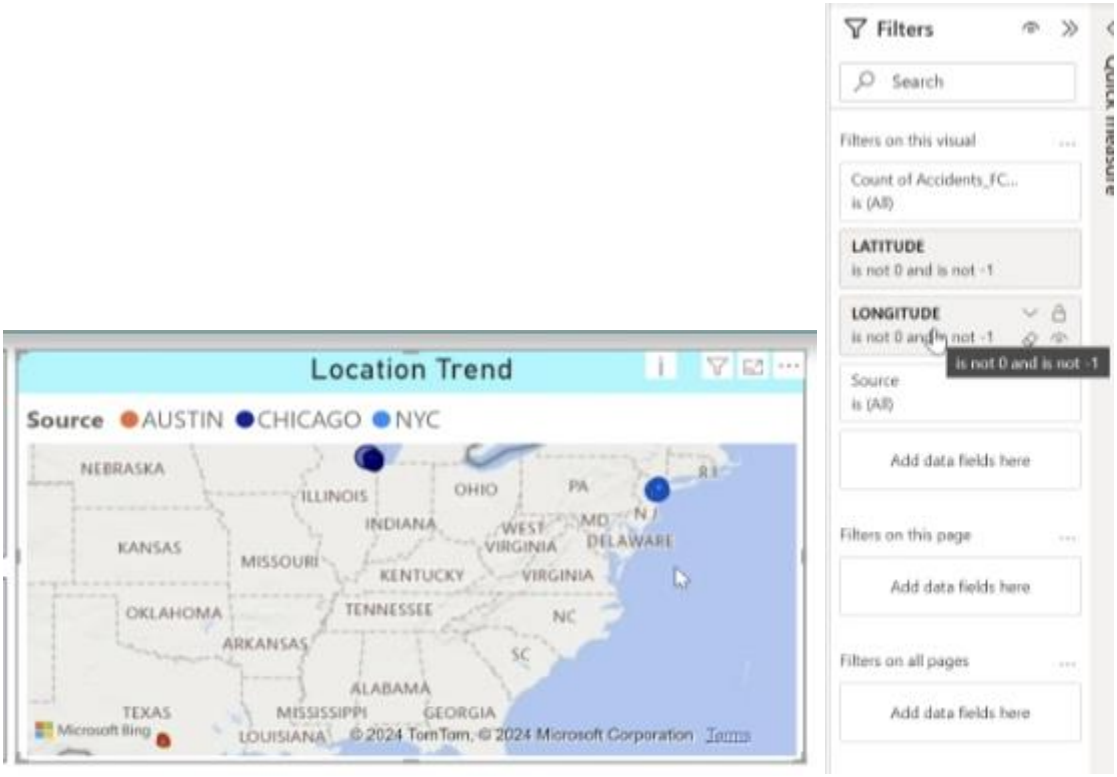
1 %

Results Messages

No_Of_Accidents	Source
48845	AUSTIN
270764	NYC



/* LOCATION TREND*/



- Ignoring 0 and 1 values for latitude longitude as they are outlier.
- Latitude longitude combination (0,0) is present in New York.
- Latitude longitude combination (-1,-1) is to replace missing values.

```
/*Location Trend Observations*/

Select Count(*), S.Source  from Fct_Accidents a join
Dim_Location l on a.Location_SK = l.Location_SK
join
Dim_Source s on a.Source_SK = s.Source_SK
where LATITUDE = 0 and LONGITUDE =0
group by s.Source
```

121 %

Results Messages

	(No column name)	Source
1	49	CHICAGO
2	4360	NYC

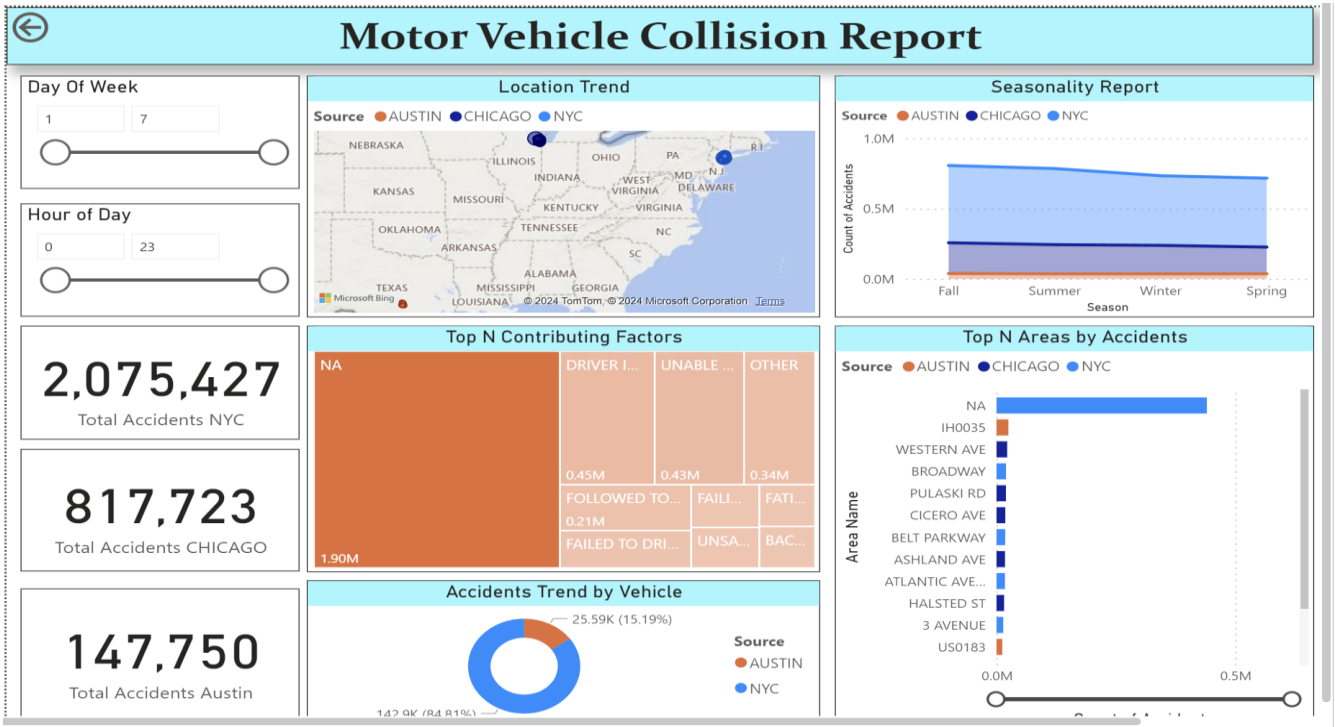
```
Select Count(*) as Count_Of_Accidents, S.Source  from Fct_Accidents a join
Dim_Location l on a.Location_SK = l.Location_SK
join
Dim_Source s on a.Source_SK = s.Source_SK
where LATITUDE = -1 and LONGITUDE =-1
group by s.Source
```

121 %

Results Messages

	Count_Of_Accidents	Source
1	2243	AUSTIN
2	5615	CHICAGO
3	233626	NYC

PowerBI VISUALIZATION



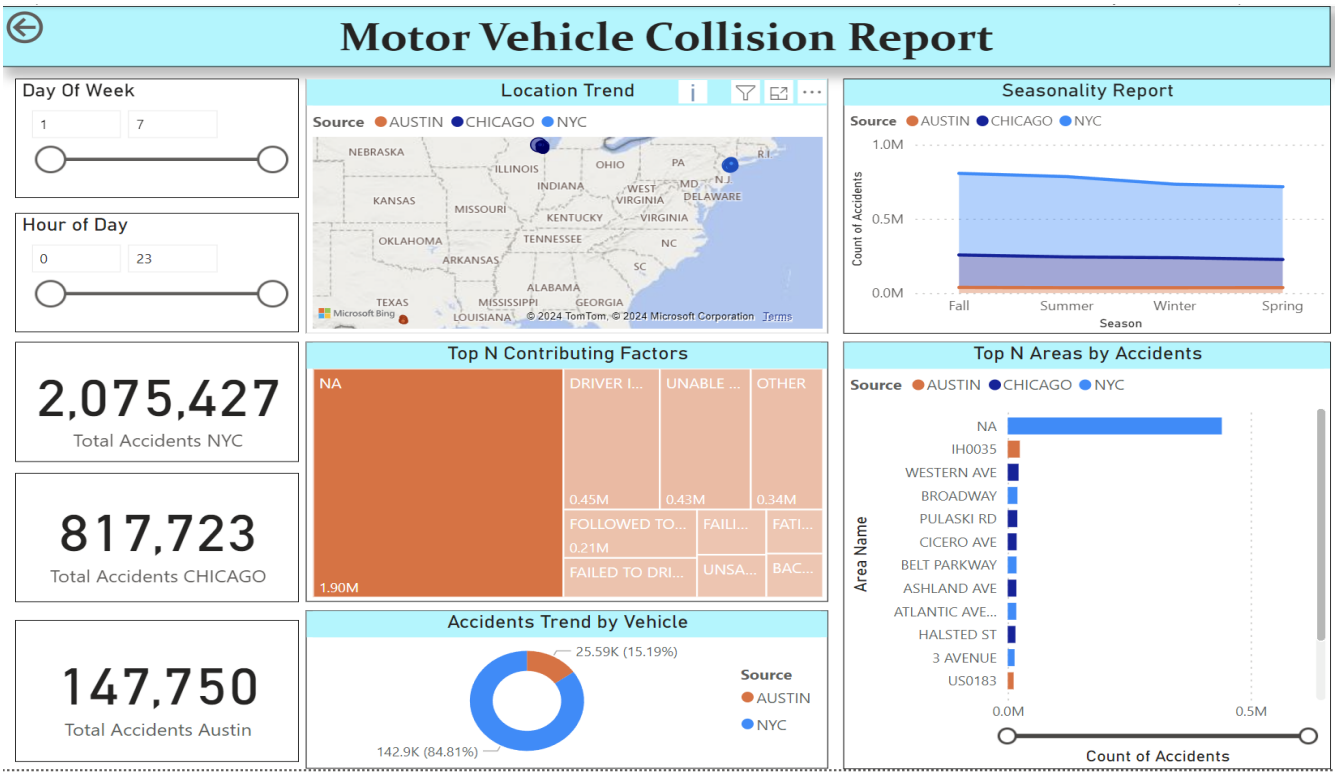


Tableau VISUALIZATION