



TESLA

PROJECT 1

Tesla Automotive Deadly
Accidents

Data Analytics and
Visualization Bootcamp

Kaggle database – Tesla Deaths (Updated 2023)

PROBLEM STATEMENT

In recent years, Tesla has surged as one of the world's most renowned car companies, as its appealing design and innovative Autopilot mode prove to be extremely appealing in the market.

However, Tesla's position as a leader in automobile safety faces the need to scrutinize its validity by evaluating the reliability of its Autopilot mode.





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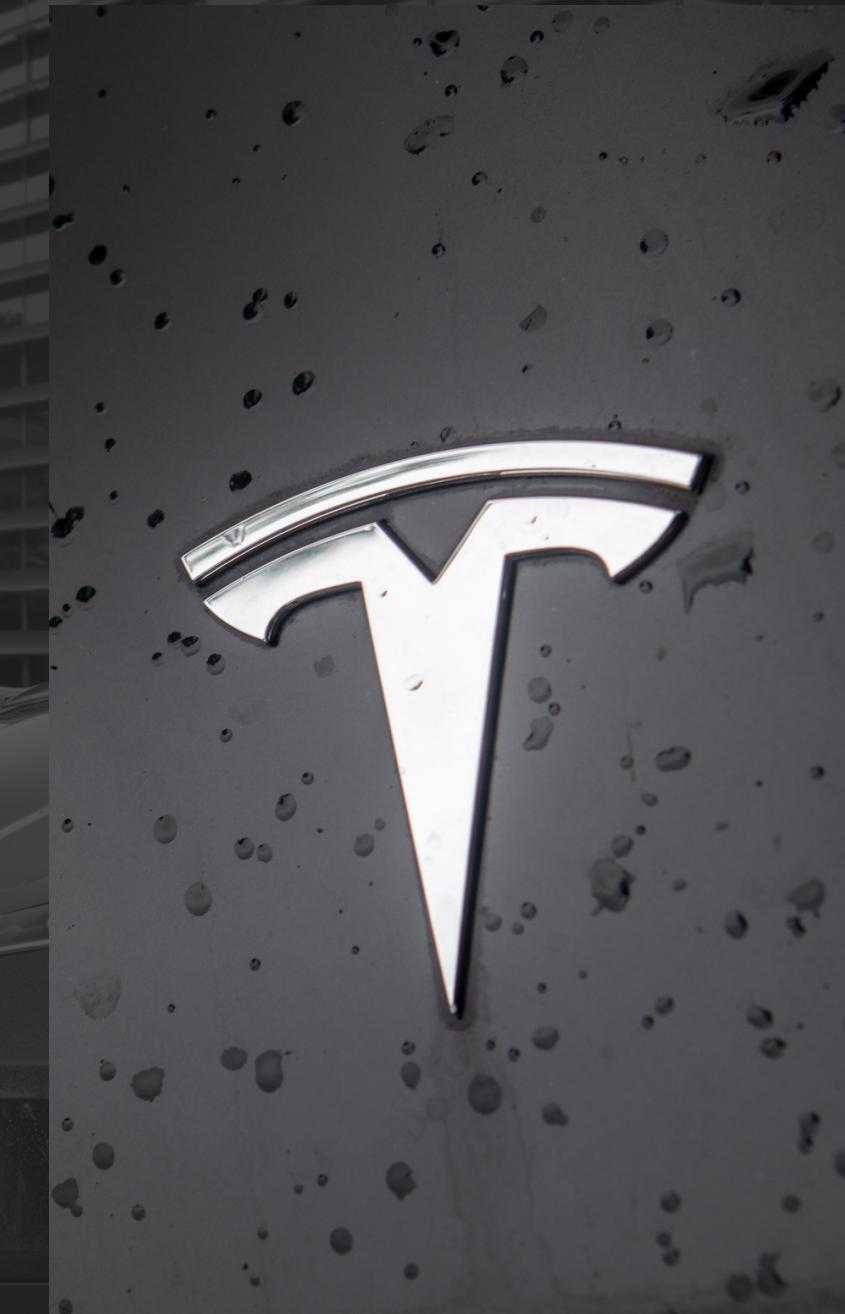


Our Questions

- How many people have died from Tesla accidents?
- What % of deaths is the autopilot to be blamed for?
- How many deaths are in comparison between drivers and autopilot?
- What are the main causes of death?
- How do deaths compare by country?
- Are Tesla's safer than other vehicles when crashing against each other?



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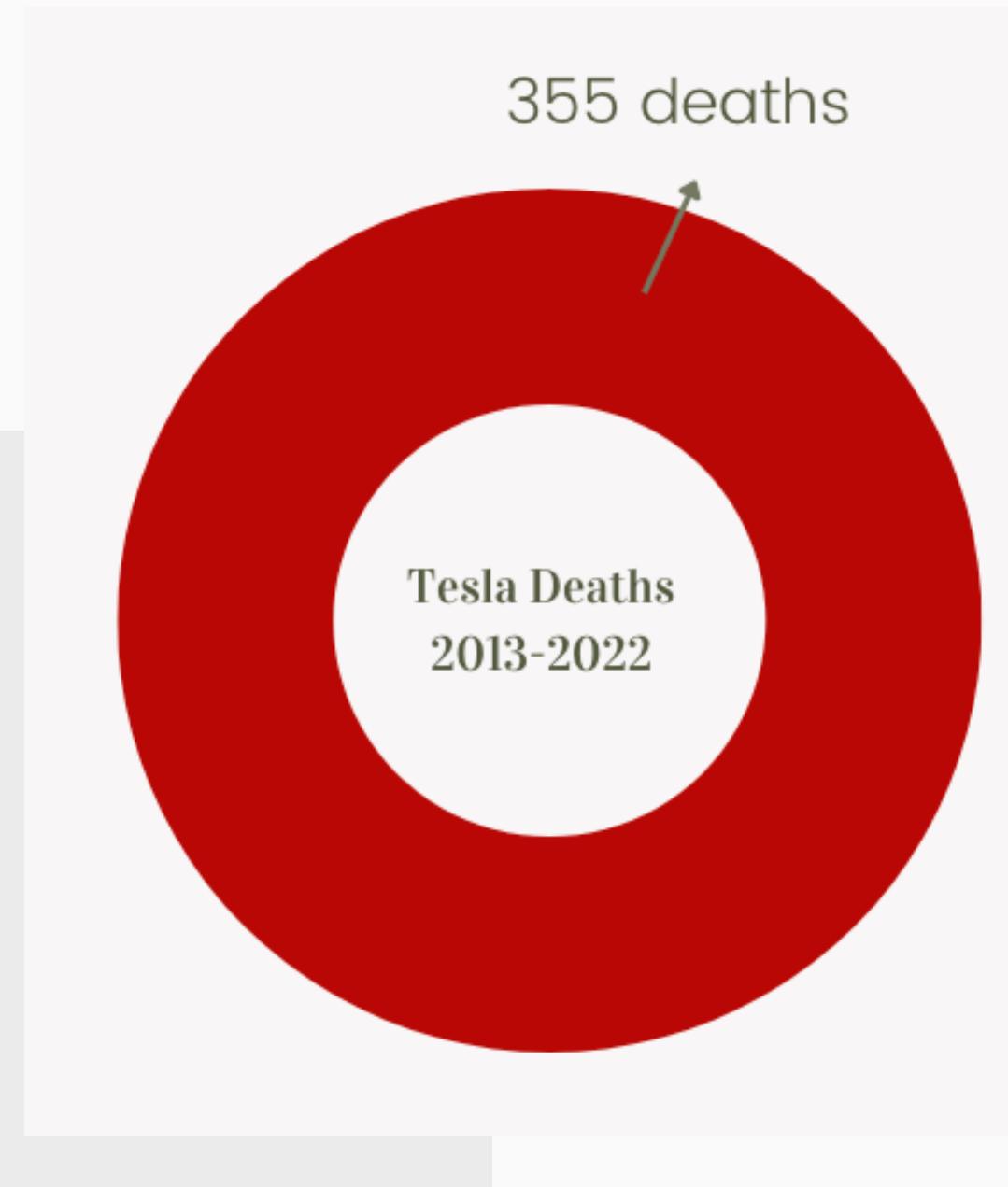
HYPOTHESIS

1. Tesla's autopilot is still in need of development and causes the most amount of deadly accidents that are reported by Tesla Owners.
2. The number of deaths that involved Tesla cars are similar within the five more important markets.
3. Tesla claims to has one of the safest cars in the market for the occupants, so the number of drivers and occupants deaths is smaller than that of other vehicles.



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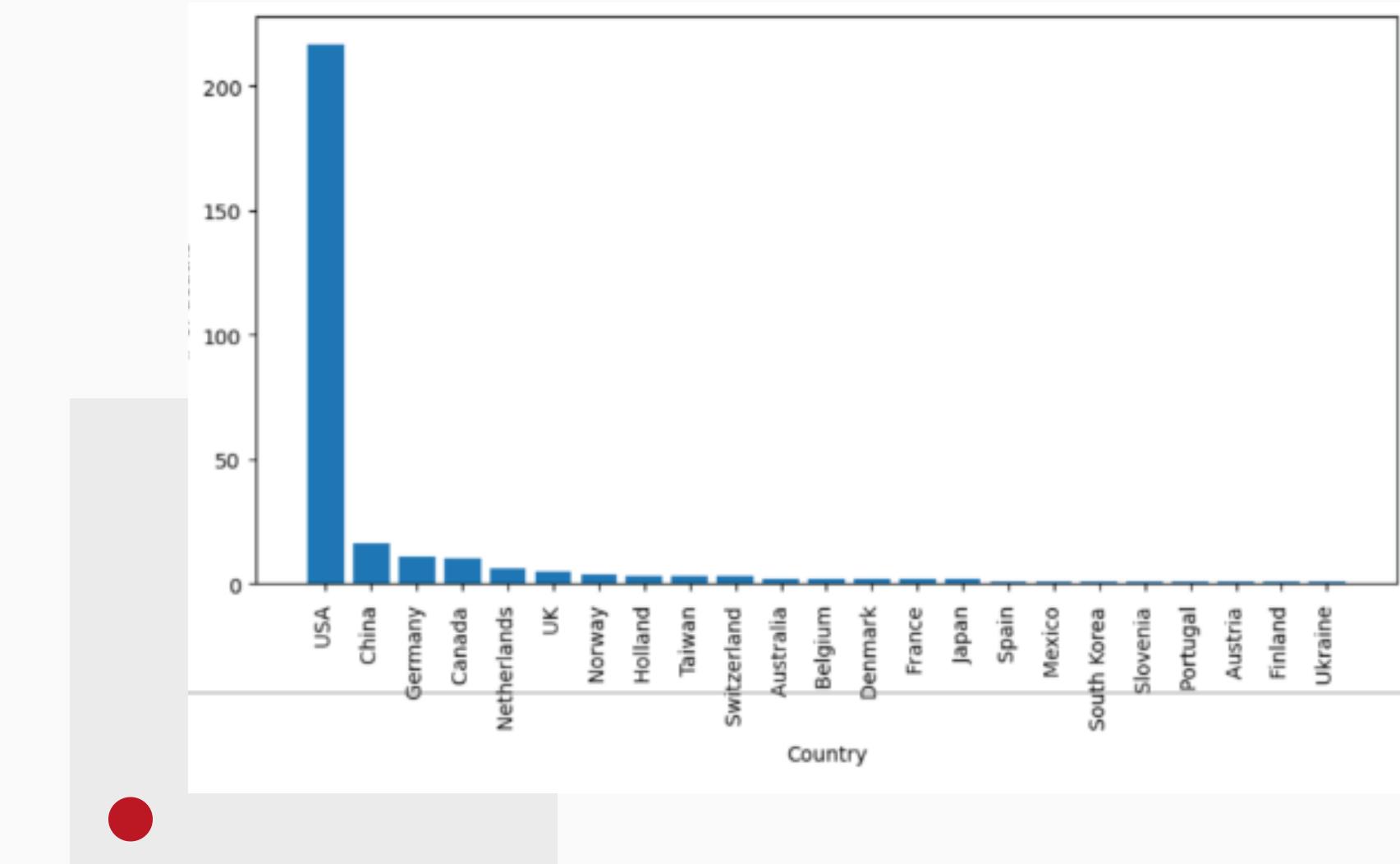
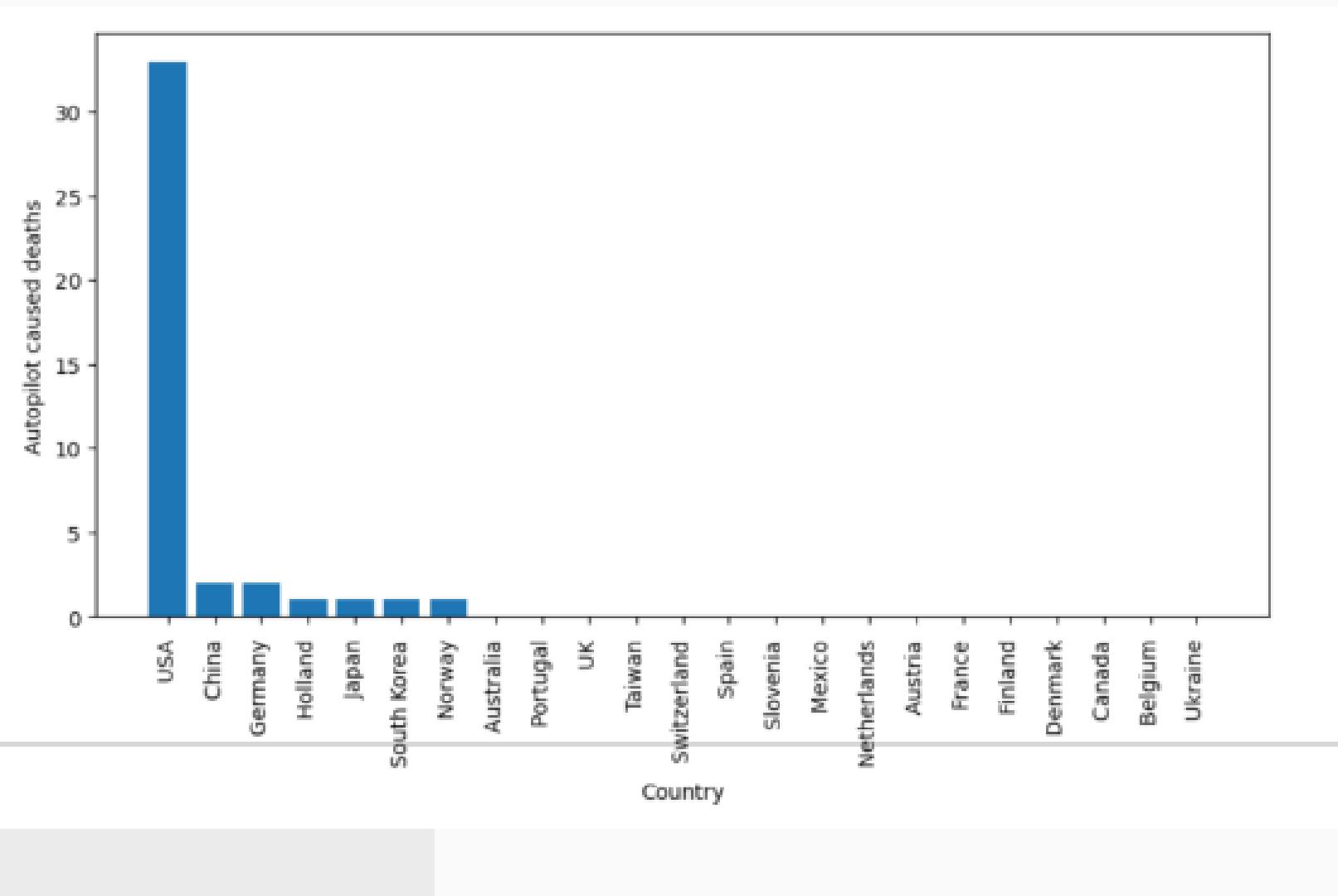
Total Deaths from Tesla Crashes



```
1 # Número de muertes totales
2 print('The number of people that have died due to accidents with Tesla cars involved are: '
3      + str(tesla_data['Deaths'].sum()))
```

The number of people that have died due to accidents with Tesla cars involved are: 355

Comparison of autopilot caused deaths vs overall deaths per country

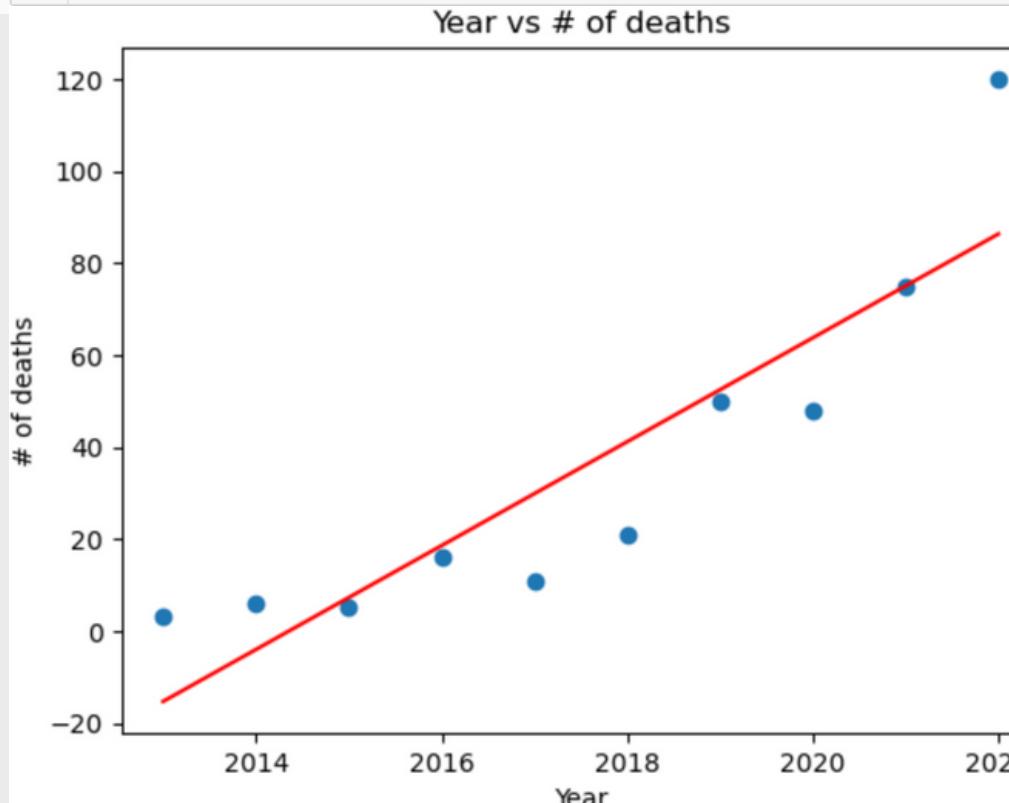




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Regression line of autopilot caused deaths vs. Overall deaths per year

```
1 # Lineal regression of deaths per year
2
3 def linear(x_values, y_values):
4     slope, intercept, rvalue, pvalue, stderr = linregress(x_values,y_values)
5     line_eq = f'y = {round(intercept,2)} + {round(slope,2)} X'
6     y_predict = intercept + (slope * x_values)
7     return line_eq, y_predict
8
9 x_values = tesla_data.groupby('Year')['Deaths'].sum().index
10 y_values = tesla_data.groupby('Year')['Deaths'].sum()
11 line_eq, y_predict = linear(x_values, y_values)
12 plt.scatter(x_values, y_values)
13 plt.plot(x_values, y_predict, color = "r")
14
15 plt.ylabel('# of deaths')
16 plt.xlabel('Year')
17 plt.title('Year vs # of deaths')
18
19 # Show plot
20 plt.show()
21
```

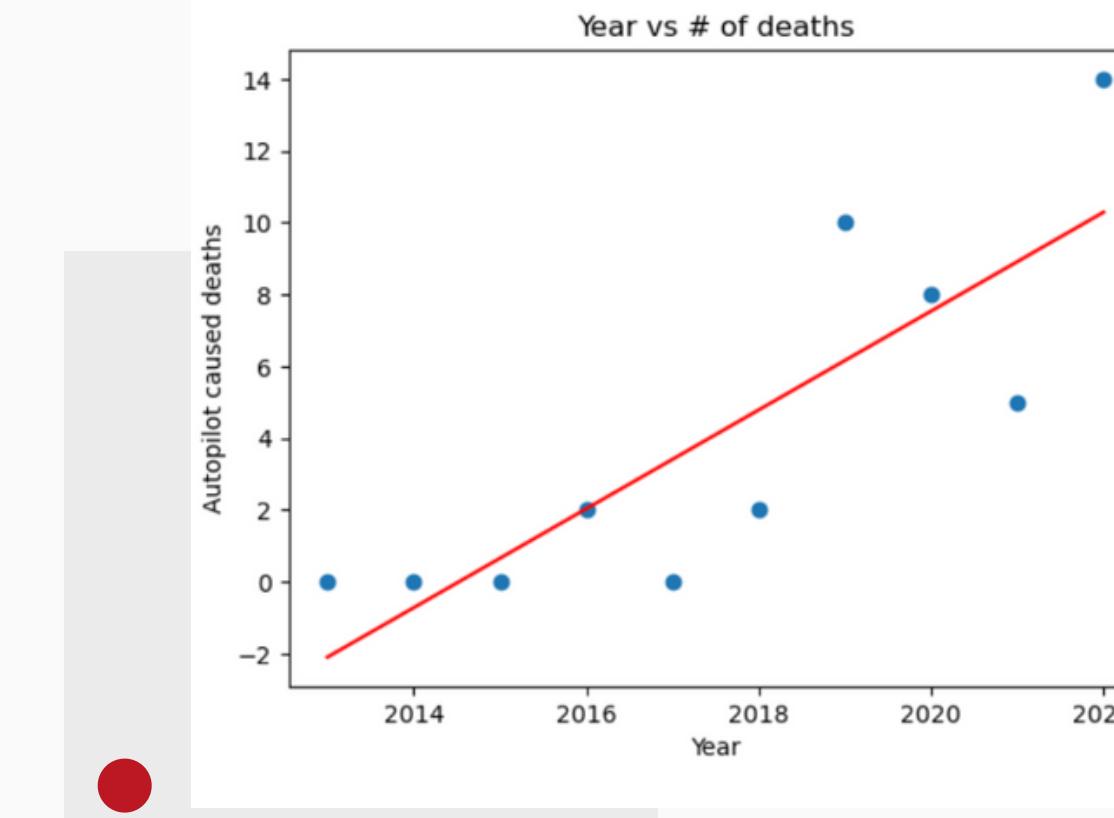


```
# linear regression of autopilot deaths per year
def linear(x_values, y_values):
    slope, intercept, rvalue, pvalue, stderr = linregress(x_values,y_values)
    line_eq = f'y = {round(intercept,2)} + {round(slope,2)} X'
    y_predict = intercept + (slope * x_values)
    return line_eq, y_predict

x_values = tesla_data.groupby('Year')[['Autopilot claimed']].sum().index
y_values = tesla_data.groupby('Year')[['Autopilot claimed']].sum()
line_eq, y_predict = linear(x_values, y_values)
plt.scatter(x_values, y_values)
plt.plot(x_values, y_predict, color = "r")
plt.annotate(line_eq, (-50,30), color = 'r', fontsize = 15)

plt.ylabel('Autopilot caused deaths')
plt.xlabel('Year')
plt.title('Year vs # of deaths')

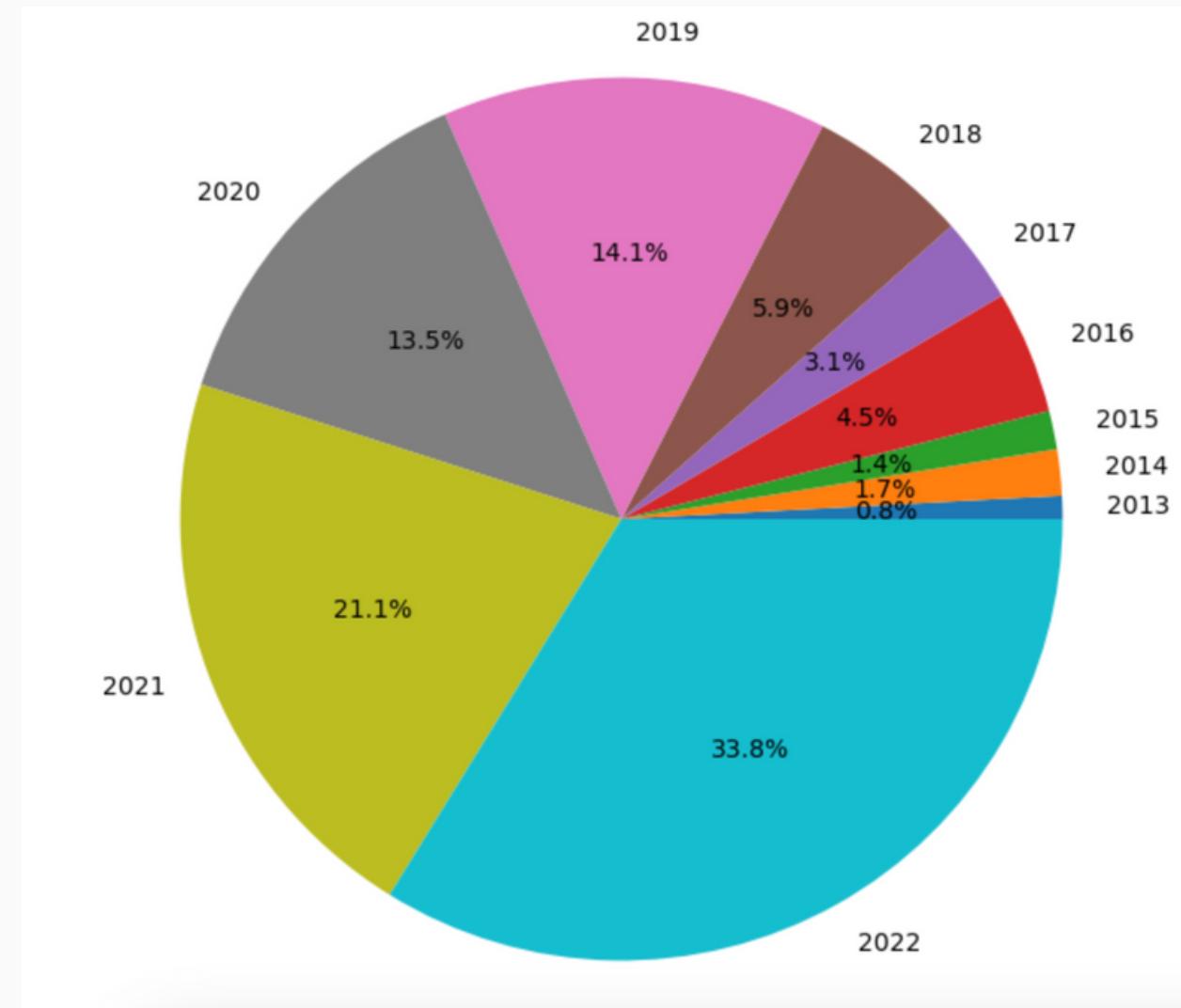
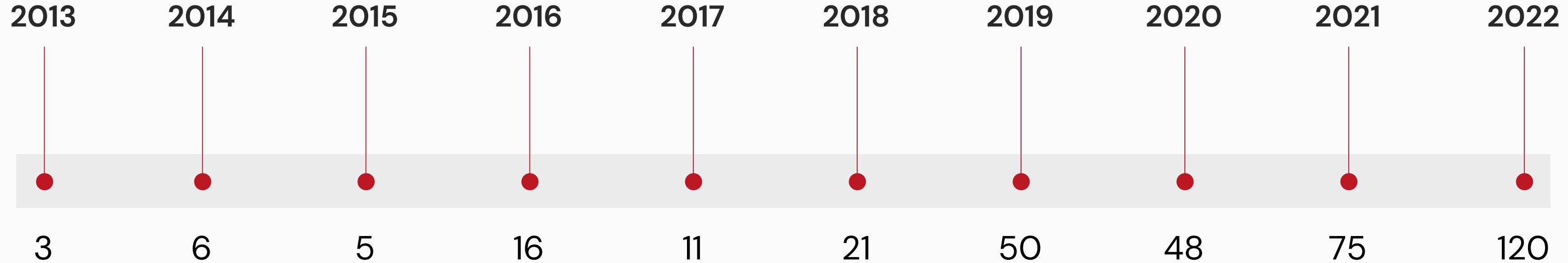
# Show plot
plt.show()
```





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Tesla deaths by year





Death Causes

```
#Causes that led to more deaths
descr = tesla_data.groupby('Description')['Deaths'].count().sort_values(ascending=False)
descr

Description
Tesla kills pedestrian          10
Tesla kills motorcyclist        6
Tesla into oncoming traffic    5
Tesla rear ends stopped car    4
Tesla drives off cliff          4
..                                ..
Single-collision on onramp      1
Six vehicle crash               1
Sleeping Tesla driver kills motorcyclist 1
Speeding Tesla crashes into car 1
Wrong way driver strikes Tesla, Tesla burns 1
Name: Deaths , Length: 250, dtype: int64
```

01

Causes that led to more deaths

```
# Top 5: Causes that led to more driver deaths
driver = tesla_data.groupby('Description')[['Tesla driver']].count().sort_values(ascending=False)
driver_1 = driver.iloc[3:]
driver_d = driver_1.head()
driver_d

Description
Tesla drives off cliff          4
Tesla rear ends stopped car    4
Three car collision            3
Tesla hits pedestrian          3
Tesla crashes into tree        3
Name: Tesla driver , dtype: int64
```

03

Top-5 driver related deaths

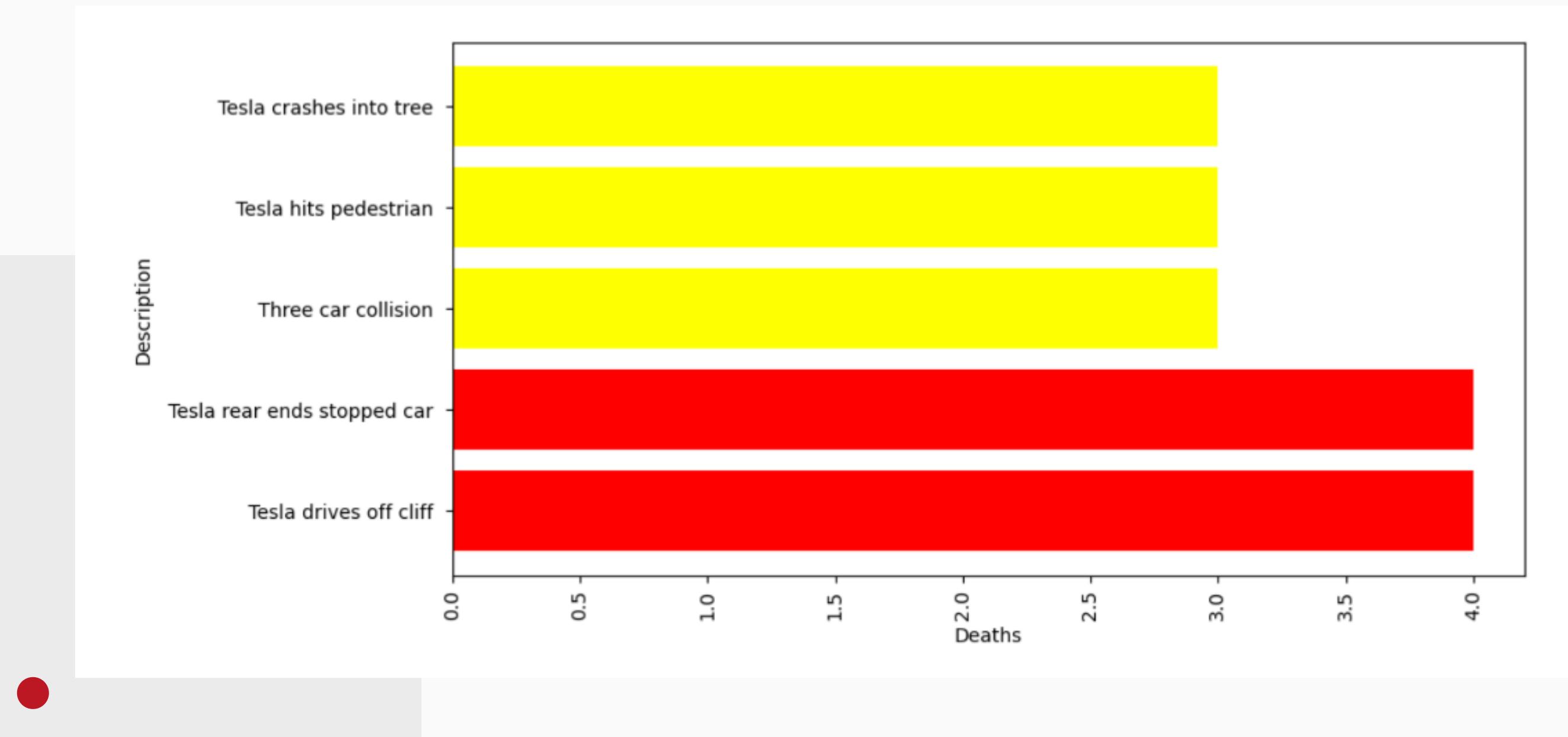
```
# Top 5: Causes that led to more deaths
descr_1 = descr.iloc[3:]
descr_1.head()

Description
Tesla rear ends stopped car    4
Tesla drives off cliff          4
Three car collision            3
Tesla hits pedestrian          3
Tesla hits motorcycle          3
Name: Deaths , dtype: int64
```



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Cause for Crashes



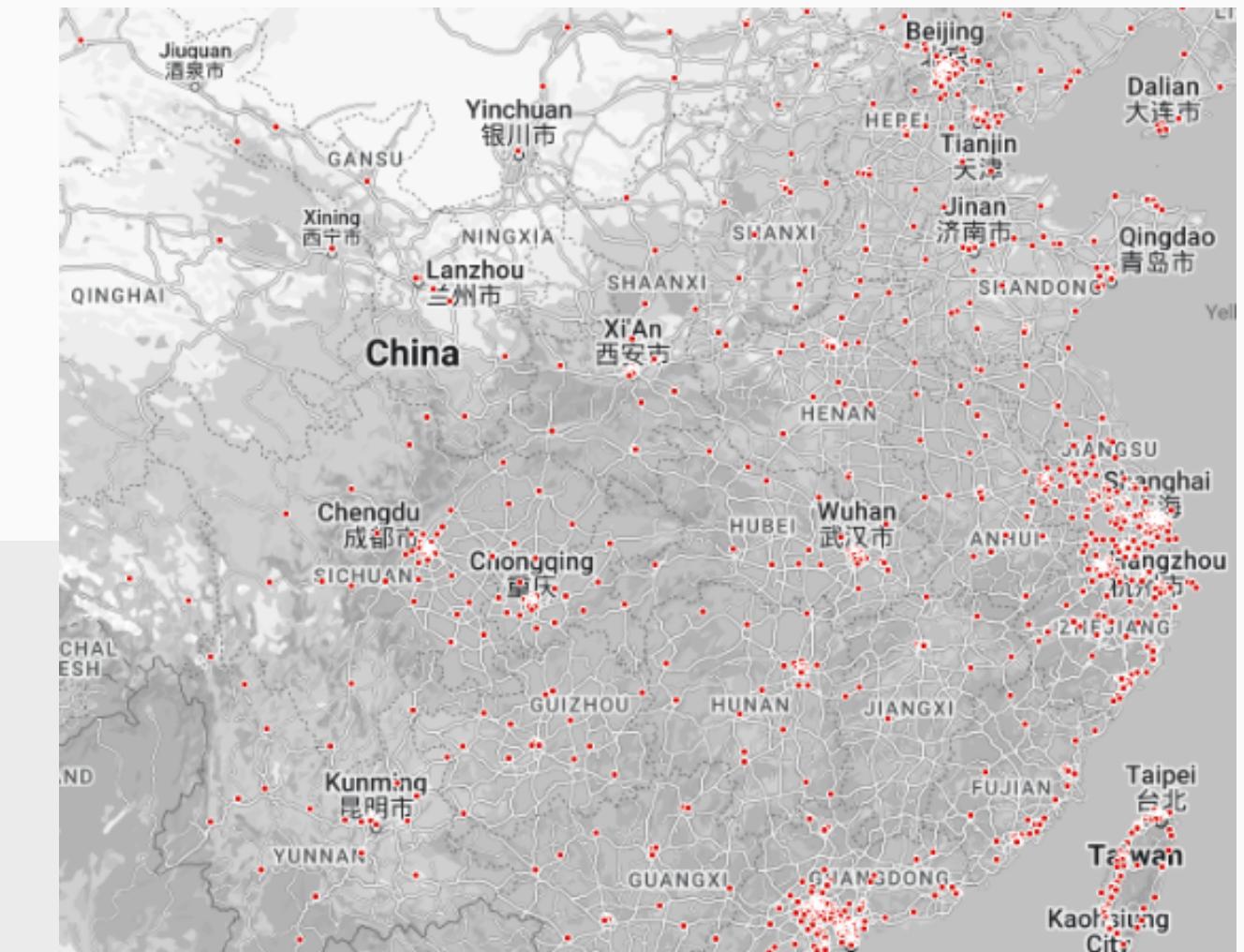
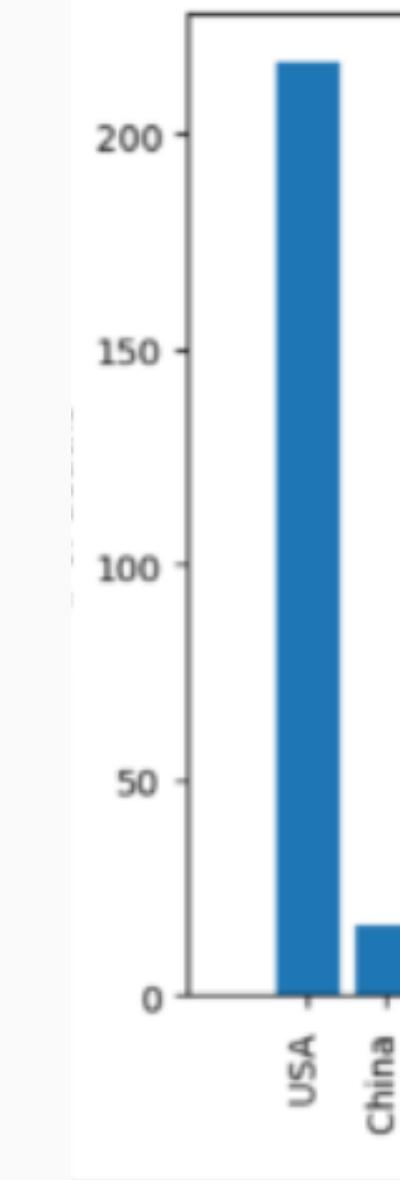
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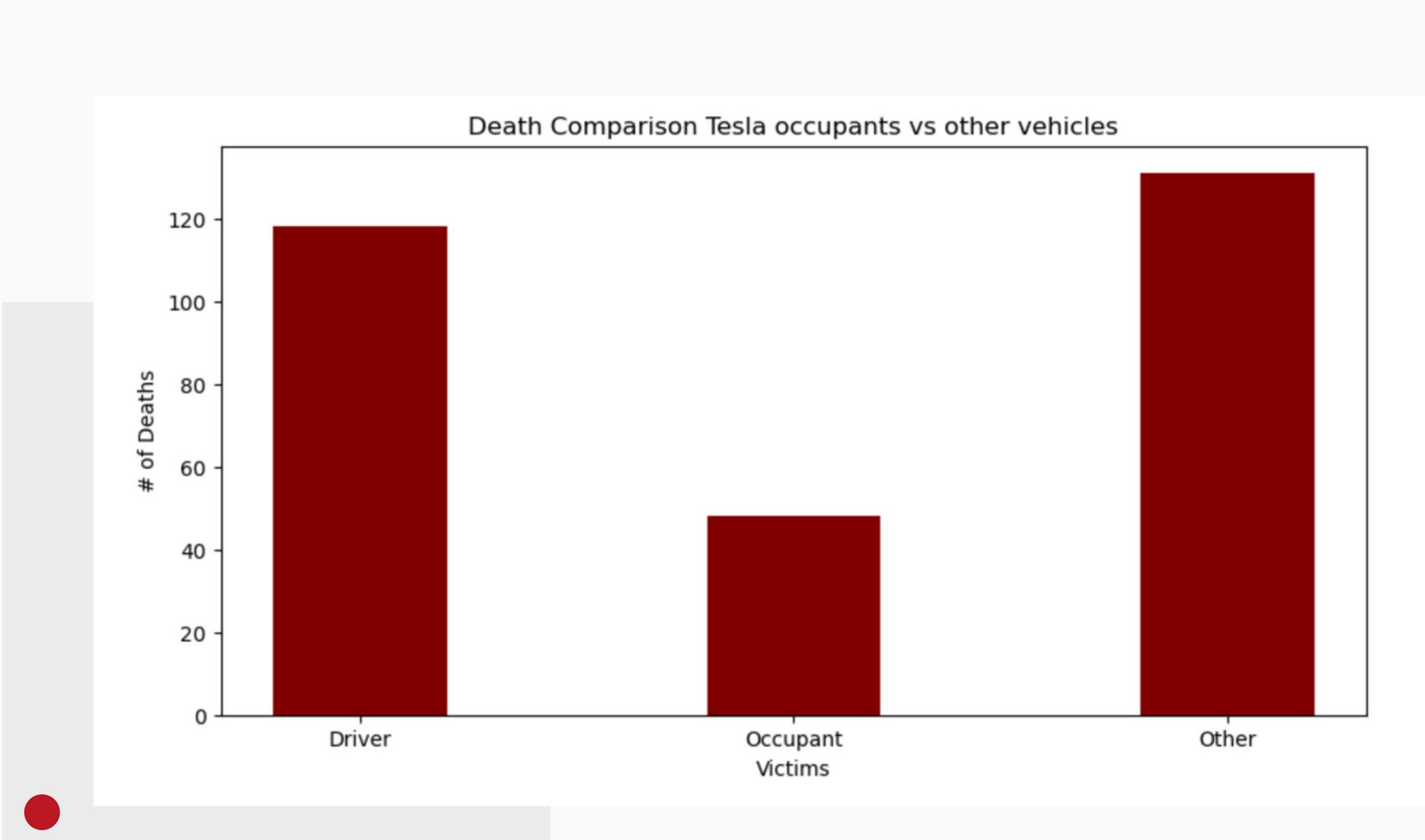
Supercharger comparison US vs. China





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Death comparison Tesla occupants vs. other vehicle occupants



```
# Calculate the total for Tesla driver (e.g., 'Column1')
total_driver = tesla_data['Tesla driver'].sum()
total_driver
```

118.0

```
# Calculate the total for Tesla occupant (e.g., 'Column2')
total_occupant = tesla_data['Tesla occupant'].sum()
total_occupant
```

48.0

```
# Calculate the total for other vehicles (e.g., 'Column3')
total_other = tesla_data['Other vehicle'].sum()
total_other
```

131.0



12/14



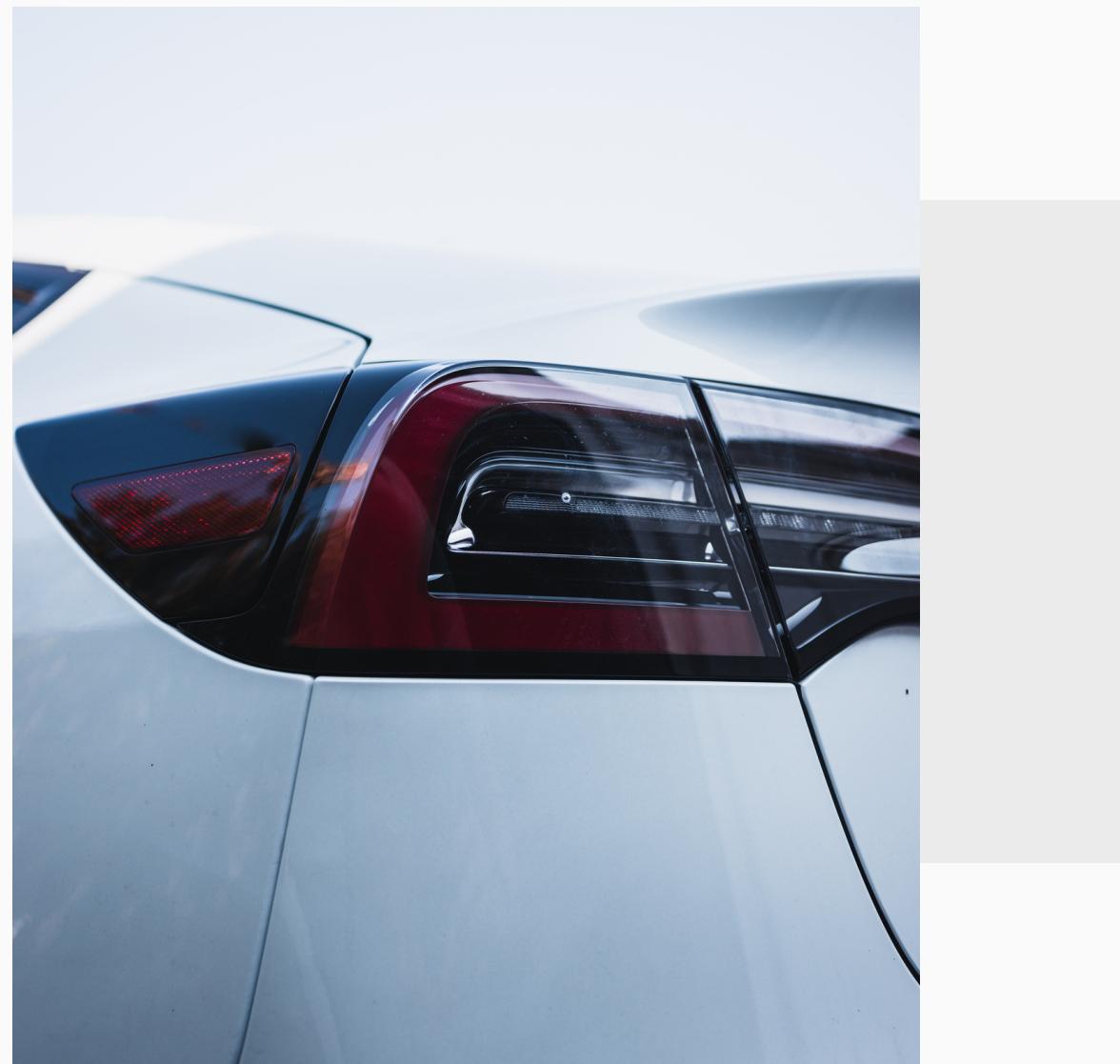
Conclusions

1. After completing the analysis, we can conclude that Tesla's autopilot is not the main cause of the crashes, however this will keep increasing throughout the years since Tesla's demand increases.
2. There's a big gap of accidents between USA and China, mainly because there's a higher demand of Tesla in the US, this can be concluded due to the amount of Tesla superchargers available on each country
3. The trends seen in the graph fail to present clear results for us to determine if Tesla is better than its competitors, another dataset would be needed to ameliorate the quality of our analysis.





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Team 6

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