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```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
```

```
[ ] data = pd.read_csv('/content/monroe county car crach 2003-2015.csv', encoding='latin-1')
```

```
data.head(10)
```

	Year	Month	Day	Weekend?	Hour	Collision Type	Injury Type	Primary Factor	Reported_Location	Latitude	Longitude
0	2015	1	5	Weekday	0.0	2-Car	No injury/unknown	OTHER (DRIVER) - EXPLAIN IN NARRATIVE	1ST & FESS	39.159207	-86.525874
1	2015	1	6	Weekday	1500.0	2-Car	No injury/unknown	FOLLOWING TOO CLOSELY	2ND & COLLEGE	39.161440	-86.534848
2	2015	1	6	Weekend	2300.0	2-Car	Non-incapacitating	DISREGARD SIGNAL/REG SIGN	BASSWOOD & BLOOMFIELD	39.149780	-86.568890
3	2015	1	7	Weekend	900.0	2-Car	Non-incapacitating	FAILURE TO YIELD RIGHT OF WAY	GATES & JACOBS	39.165655	-86.575956
4	2015	1	7	Weekend	1100.0	2-Car	No injury/unknown	FAILURE TO YIELD RIGHT OF WAY	W 3RD	39.164848	-86.579625
5	2015	1	6	Weekday	1800.0	2-Car	No injury/unknown	FAILURE TO YIELD RIGHT OF WAY	BURKS & WALNUT	39.126670	-86.531370
6	2015	1	6	Weekday	1200.0	2-Car	No injury/unknown	DRIVER DISTRACTED - EXPLAIN IN NARRATIVE	SOUTH CURRY PIKE LOT 71	39.150825	-86.584899
7	2015	1	6	Weekday	1400.0	1-Car	Incapacitating	ENGINE FAILURE OR DEFECTIVE	NORTH LOUDEN RD	39.199272	-86.637024
8	2015	1	7	Weekend	1400.0	2-Car	No injury/unknown	FOLLOWING TOO CLOSELY	LIBERTY & W 3RD	39.164610	-86.579130
9	2015	1	7	Weekend	1600.0	1-Car	No injury/unknown	RAN OFF ROAD RIGHT	PATTERSON & W 3RD	39.163440	-86.551280

```
[ ] data.tail(10)
```

	Year	Month	Day	Weekend?	Hour	Collision _	Injury Type	Primary Factor	Reported Location	Latitude	Longitude

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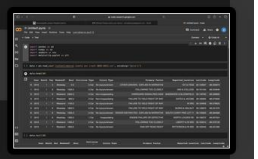
53933	2003	9	2	Weekday	900.0	2-Car	Non-incapacitating	LEFT OF CENTER	SR37	0.0	0.0
53934	2003	10	1	Weekday	2100.0	2-Car	No injury/unknown	IMPROPER LANE USAGE	10TH & TULIP TREE LOT	0.0	0.0
53935	2003	10	3	Weekday	1900.0	2-Car	No injury/unknown	OTHER (DRIVER) - EXPLAIN IN NARRATIVE	IU LIBRARY PARKING LOT & JORDAN	0.0	0.0
53936	2003	10	4	Weekday	1700.0	1-Car	Non-incapacitating	OVERCORRECTING/OVERSTEERING	RAPPLE & SR45	0.0	0.0
53937	2003	10	5	Weekday	1800.0	2-Car	No injury/unknown	IMPROPER TURNING	EDUCATION LOT & ROSE	0.0	0.0
53938	2003	10	6	Weekday	1700.0	2-Car	No injury/unknown	IMPROPER LANE USAGE	DUNN & WHITE LOT WEST	0.0	0.0
53939	2003	11	3	Weekday	800.0	1-Car	No injury/unknown	UNSAFE SPEED	RED OAK & SR446	0.0	0.0
53940	2003	12	5	Weekday	1200.0	2-Car	No injury/unknown	BRAKE FAILURE OR DEFECTIVE	2ND ST & WALNUT	0.0	0.0
53941	2003	12	1	Weekend	700.0	2-Car	No injury/unknown	UNSAFE BACKING	NINETH & NORTH	0.0	0.0
53942	2003	12	7	Weekend	1700.0	2-Car	Non-incapacitating	OTHER (DRIVER) - EXPLAIN IN NARRATIVE	MONROW & THIRD ST	0.0	0.0

```
[ ] data.shape
```

```
(53943, 11)
```

```
[ ] data.size
```

```
593373
```



```
data.describe()
```

	Year	Month	Day	Hour	Latitude	Longitude
count	53943.000000	53943.000000	53943.000000	53718.000000	53913.000000	53913.000000
mean	2008.968059	6.662162	4.196912	1347.265349	35.582109	-78.619224
std	3.789760	3.514630	1.909440	531.654039	11.289883	24.957587
min	2003.000000	1.000000	1.000000	0.000000	0.000000	-88.959213
25%	2006.000000	4.000000	3.000000	1000.000000	39.142048	-86.551520
50%	2009.000000	7.000000	4.000000	1400.000000	39.164430	-86.530992
75%	2012.000000	10.000000	6.000000	1700.000000	39.173344	-86.508288
max	2015.000000	12.000000	7.000000	2300.000000	41.228665	86.596363

```
[ ] data.columns
```

```
Index(['Year', 'Month', 'Day', 'Weekend?', 'Hour', 'Collision Type',
       'Injury Type', 'Primary Factor', 'Reported_Location', 'Latitude',
       'Longitude'],
      dtype='object')
```

```
[ ] data.index
```

```
RangeIndex(start=0, stop=53943, step=1)
```

```
[ ] data.isnull().sum()
```

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```
Year                  0
Month                 0
Day                   0
Weekend?             68
Hour                225
Collision Type        6
Injury Type           0
Primary Factor     1121
Reported_Location    35
Latitude             30
Longitude            30
dtype: int64
```

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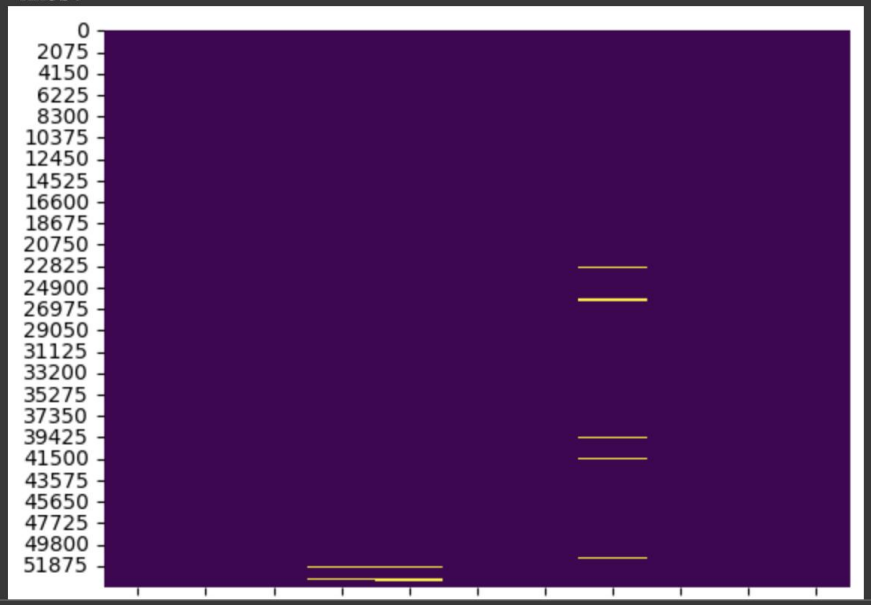
```
[ ] sns.heatmap(data.isnull(),cmap  ='viridis',cbar=False)
```

```
<Axes: >
```



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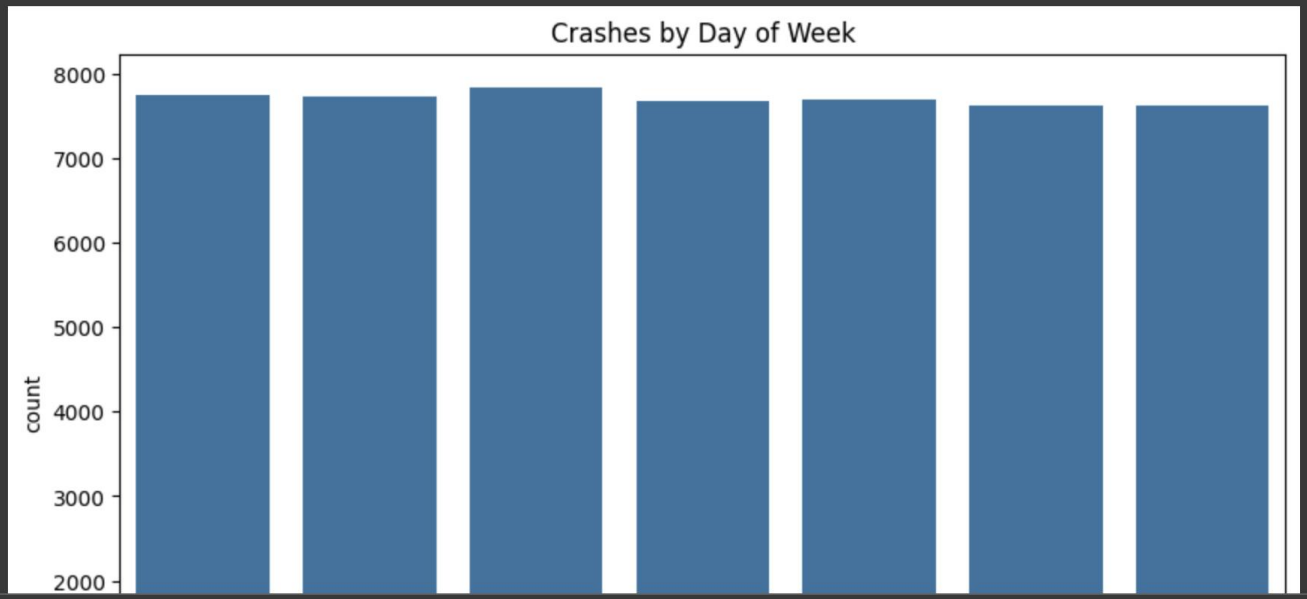
```
[ ] data['Weekend?'].unique()
```

```
array(['Weekday', 'Weekend', nan], dtype=object)
```

```
[ ] data['Weekend?'] =data['Weekend?'].map({'Weekday':0,'Weekend':1})
```

```
[ ] data['DayOfWeek'] = pd.to_datetime(data[['Year','Month','Day']]).dt.day_name()
```

```
plt.figure(figsize=(10,6))
sns.countplot(x=  'DayOfWeek',data=data,order= ['Monday','Tuesday','Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday'])
plt.title('Crashes by Day of Week')
plt.show()
```



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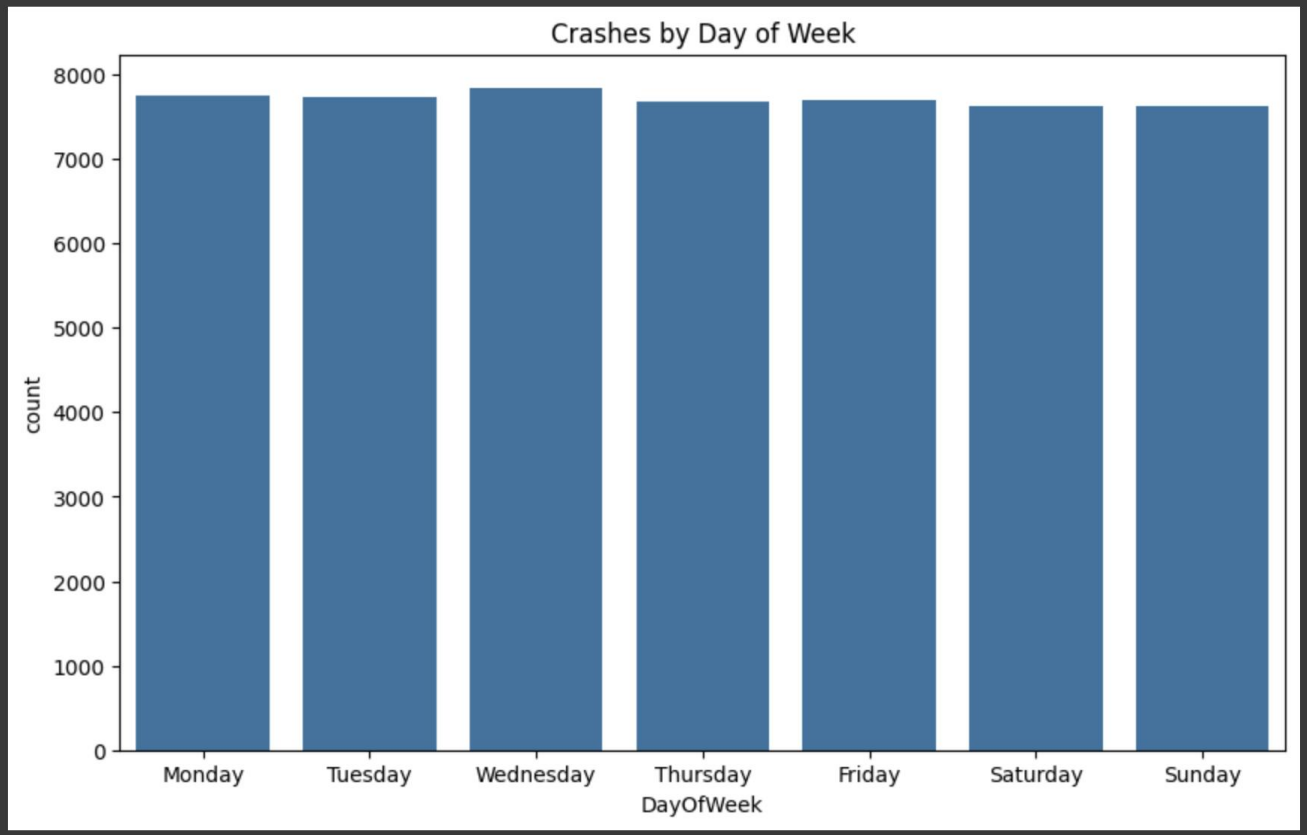
```
plt.show()
```




```
[ ]  plt.figure(figsize=(20,6))
     sns.countplot(x = 'Hour',data=data)
     plt.title('Crashes by hour')
     plt.xlabel("Hour of the Day")
```

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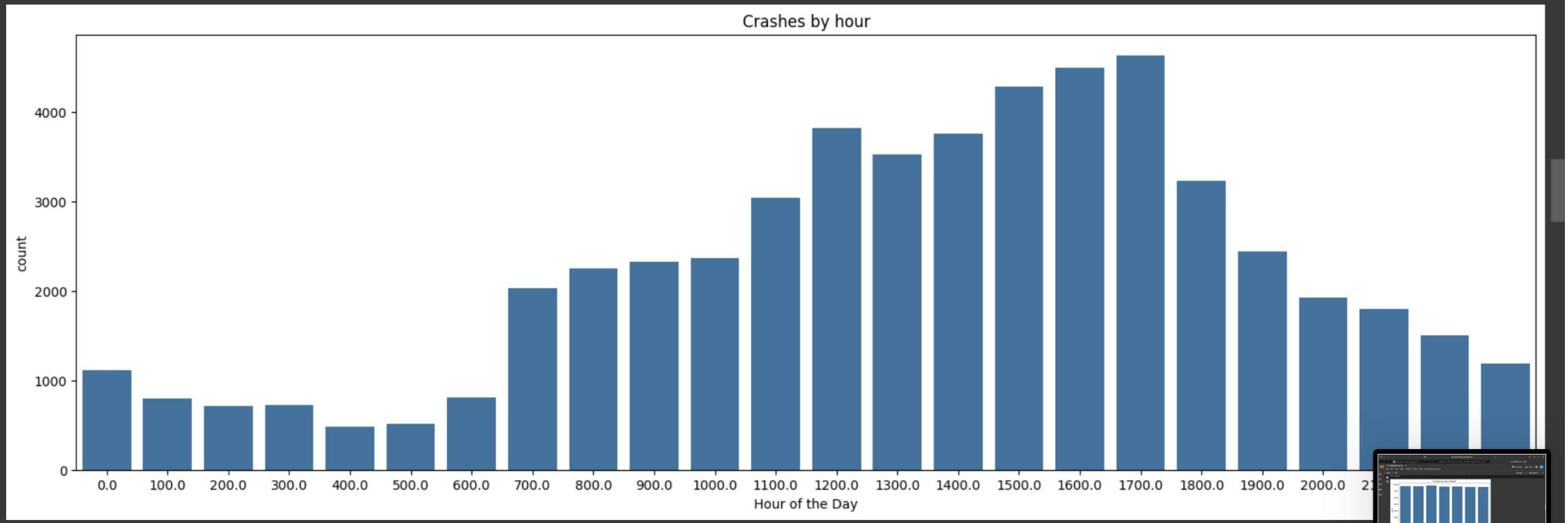
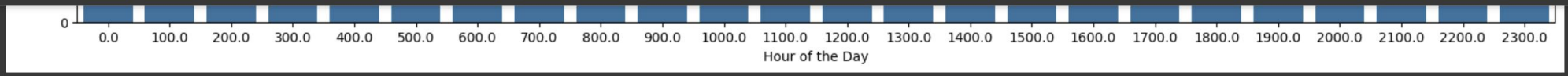
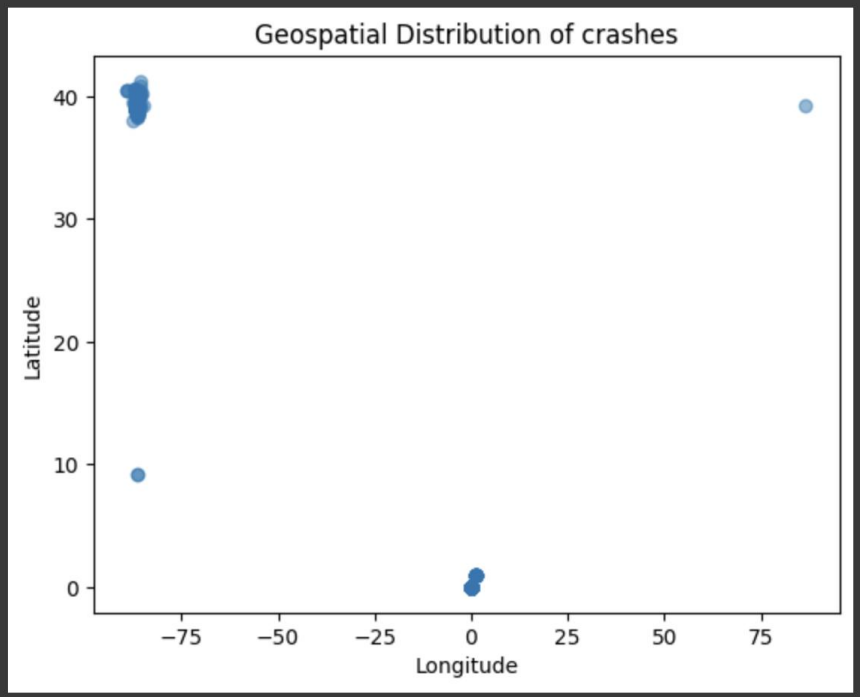
```
plt.figure(figsize=(20,6))
sns.countplot(x = 'Hour',data=data)
plt.title('Crashes by hour')
plt.xlabel("Hour of the Day")
plt.show()
```




```
[ ] plt.scatter(data['Longitude'],data['Latitude'],alpha =0.5)
    plt.title('Geospatial Distribution of crashes')
    plt.xlabel('Longitude')
```




```
plt.scatter(data['Longitude'],data['Latitude'],alpha =0.5)
plt.title('Geospatial Distribution of crashes')
plt.xlabel('Longitude')
plt.ylabel('Latitude')
plt.show()
```



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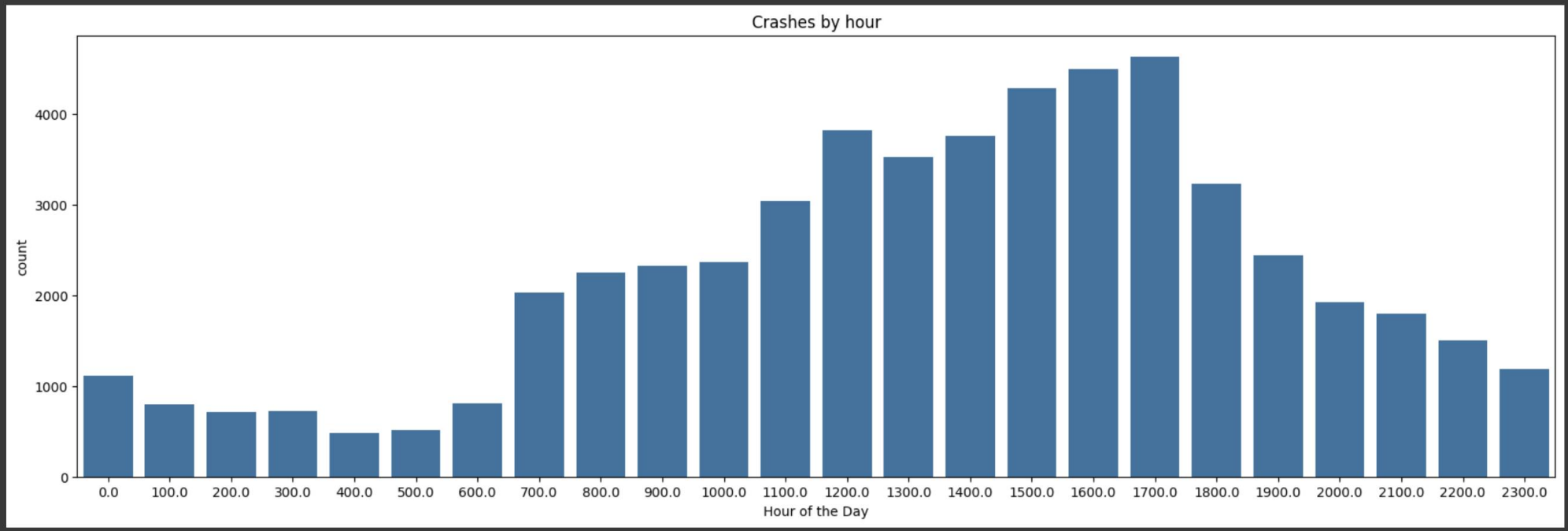
Longitude

```
plt.figure(figsize=(20,6))
sns.countplot(x = 'Hour',data=data)
plt.title('Crashes by hour')
plt.xlabel("Hour of the Day")
plt.show()
```




```
[ ] plt.figure(figsize=(10,6))
    sns.countplot(x = 'Collision Type',data= data)
    plt.title('Distribution of Collision Types')
```

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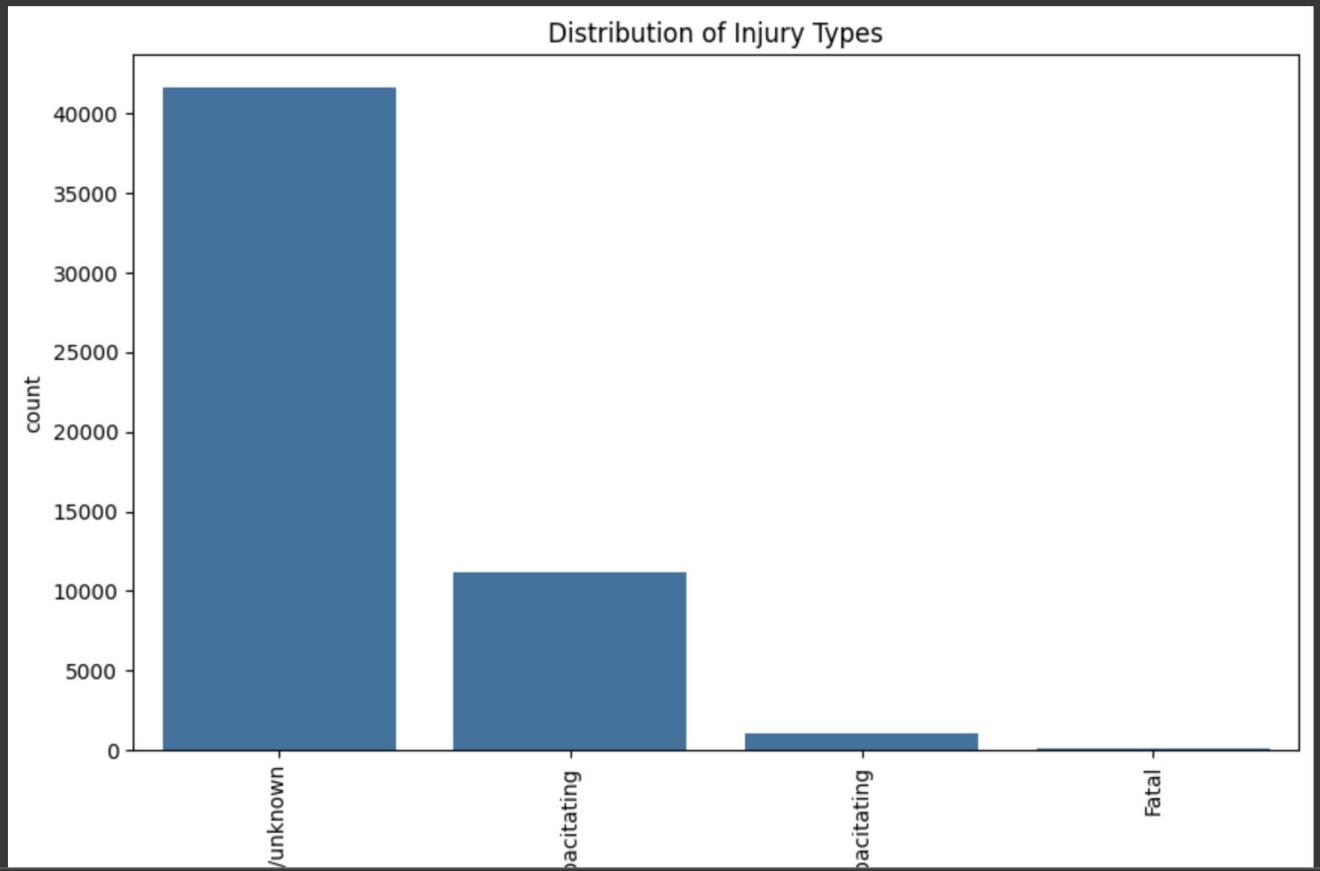
```
plt.figure(figsize = (10,6))
sns.countplot(x ='Injury Type',data=data)
plt.title('Distribution of Injury Types')
plt.xticks(rotation = 90)
plt.show()
```



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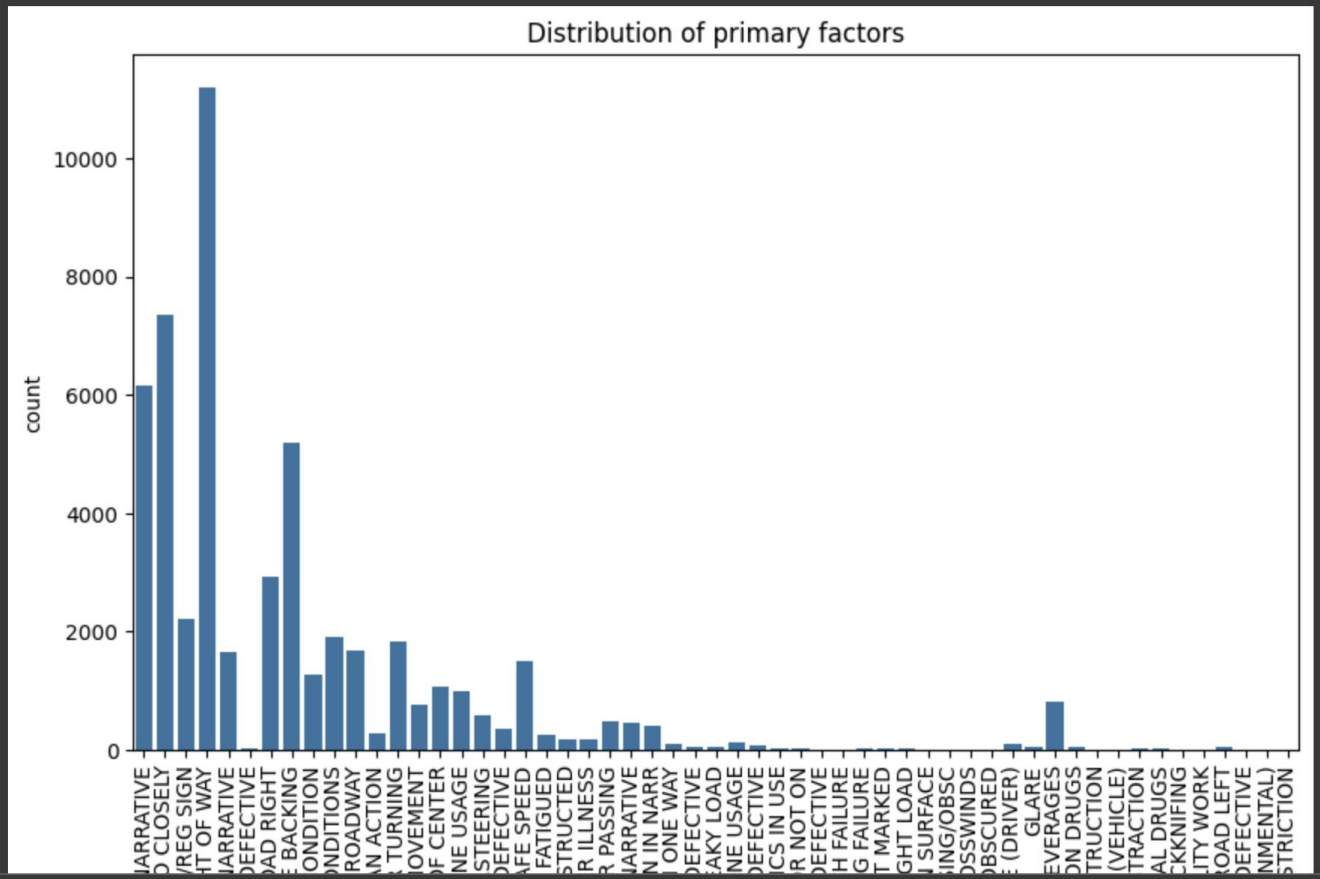
```
plt.figure(figsize=(10,6))
sns.countplot(x = "Primary Factor",data=data)
plt.title('Distribution of primary factors')
plt.xticks(rotation =90)
plt.show()
```



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```
[ ] numerical_columns = data.select_dtypes(include=['float64', 'int64']).columns
    numerical_data = data[numerical_columns]
```

```
correlation_matrix = numerical_data.corr()
plt.figure(figsize=(10, 8))
sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm', fmt='.2f')
plt.title('Correlation Matrix of Numerical Features')
plt.show()
```