ASSIGNMENT-2 NAME: R. Narendra REG NO:21BCE9716

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

dataset=pd.read_csv("car_crashes.csv")
dataset
```

```
    total  speeding  alcohol  not_distracted  no_previous  ins_premium  \
0    18.8     7.332    5.640          18.048       15.040       784.55

1    18.1     7.421    4.525          16.290       17.014      1053.48

2    18.6     6.510    5.208          15.624       17.856       899.47

3    22.4     4.032    5.824          21.056       21.280       827.34

4    12.0     4.200    3.360          10.920       10.680       878.41

5    13.6     5.032    3.808          10.744       12.920       835.50

6    10.8     4.968    3.888           9.396        8.856      1068.73

7    16.2     6.156    4.860          14.094       16.038      1137.87

8     5.9     2.006    1.593           5.900        5.900      1273.89

9    17.9     3.759    5.191          16.468       16.826      1160.13

10   15.6     2.964    3.900          14.820       14.508       913.15

11   17.5     9.450    7.175          14.350       15.225       861.18

12   15.3     5.508    4.437          13.005       14.994       641.96

13   12.8     4.608    4.352          12.032       12.288       803.11

14   14.5     3.625    4.205          13.775       13.775       710.46

15   15.7     2.669    3.925          15.229       13.659       649.06

16   17.8     4.806    4.272          13.706       15.130       780.45

17   21.4     4.066    4.922          16.692       16.264       872.51

18   20.5     7.175    6.765          14.965       20.090      1281.55
```

19	15.1	5.738	4.530	13.137	12.684	661.88
20	12.5	4.250	4.000	8.875	12.375	1048.78
21	8.2	1.886	2.870	7.134	6.560	1011.14
22	14.1	3.384	3.948	13.395	10.857	1110.61
23	9.6	2.208	2.784	8.448	8.448	777.18
24	17.6	2.640	5.456	1.760	17.600	896.07
25	16.1	6.923	5.474	14.812	13.524	790.32
26	21.4	8.346	9.416	17.976	18.190	816.21
27	14.9	1.937	5.215	13.857	13.410	732.28
28	14.7	5.439	4.704	13.965	14.553	1029.87
29	11.6	4.060	3.480	10.092	9.628	746.54
30	11.2	1.792	3.136	9.632	8.736	1301.52
31	18.4	3.496	4.968	12.328	18.032	869.85
32	12.3	3.936	3.567	10.824	9.840	1234.31
33	16.8	6.552	5.208	15.792	13.608	708.24
34	23.9	5.497	10.038	23.661	20.554	688.75
35	14.1	3.948	4.794	13.959	11.562	697.73
36	19.9	6.368	5.771	18.308	18.706	881.51
37	12.8	4.224	3.328	8.576	11.520	804.71
38	18.2	9.100	5.642	17.472	16.016	905.99
39	11.1	3.774	4.218	10.212	8.769	1148.99
40	23.9	9.082	9.799	22.944	19.359	858.97
41	19.4	6.014	6.402	19.012	16.684	669.31
42	19.5	4.095	5.655	15.990	15.795	767.91
43	19.4	7.760	7.372	17.654	16.878	1004.75
44	11.3	4.859	1.808	9.944	10.848	809.38

```
45   13.6     4.080    4.080          13.056      12.920      716.20

46   12.7     2.413    3.429          11.049      11.176      768.95

47   10.6     4.452    3.498           8.692       9.116      890.03

48   23.8     8.092    6.664          23.086      20.706      992.61

49   13.8     4.968    4.554           5.382      11.592      670.31

50   17.4     7.308    5.568          14.094      15.660      791.14
```

```
    ins_losses abbrev
0       145.08     AL
1       133.93     AK
2       110.35     AZ
3       142.39     AR
4       165.63     CA
5       139.91     CO
6       167.02     CT
7       151.48     DE
8       136.05     DC
9       144.18     FL
10      142.80     GA
11      120.92     HI
12       82.75     ID
13      139.15     IL
14      108.92     IN
15      114.47     IA
16      133.80     KS
17      137.13     KY
18      194.78     LA
19       96.57     ME
20      192.70     MD
21      135.63     MA
22      152.26     MI
23      133.35     MN
24      155.77     MS
25      144.45     MO
26       85.15     MT
27      114.82     NE
28      138.71     NV
29      120.21     NH
30      159.85     NJ
31      120.75     NM
32      150.01     NY
33      127.82     NC
34      109.72     ND
```

```
35      133.52     OH
36      178.86     OK
37      104.61     OR
38      153.86     PA
39      148.58     RI
40      116.29     SC
41       96.87     SD
42      155.57     TN
43      156.83     TX
44      109.48     UT
45      109.61     VT
46      153.72     VA
47      111.62     WA
48      152.56     WV
49      106.62     WI
50      122.04     WY
```

```
dataset.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 51 entries, 0 to 50
Data columns (total 8 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   total           51 non-null     float64
 1   speeding        51 non-null     float64
 2   alcohol         51 non-null     float64
 3   not_distracted  51 non-null     float64
 4   no_previous     51 non-null     float64
 5   ins_premium     51 non-null     float64
 6   ins_losses      51 non-null     float64
 7   abbrev          51 non-null     object
dtypes: float64(7), object(1)
memory usage: 3.3+ KB
```

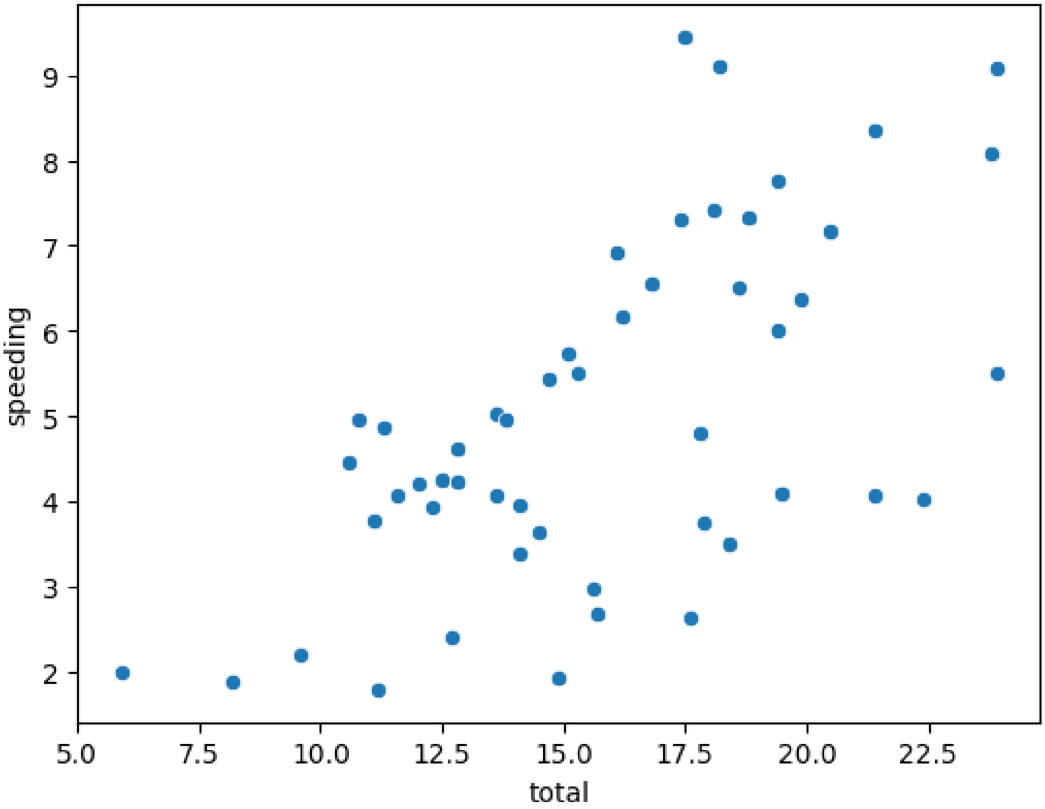
```
dataset.head(8)
```

```
   total  speeding  alcohol  not_distracted  no_previous  ins_premium
\
0   18.8     7.332    5.640          18.048       15.040       784.55

1   18.1     7.421    4.525          16.290       17.014      1053.48

2   18.6     6.510    5.208          15.624       17.856       899.47

3   22.4     4.032    5.824          21.056       21.280       827.34

4   12.0     4.200    3.360          10.920       10.680       878.41

5   13.6     5.032    3.808          10.744       12.920       835.50
```

```
6   10.8      4.968    3.888             9.396         8.856        1068.73

7   16.2      6.156    4.860            14.094        16.038        1137.87


   ins_losses abbrev
0      145.08     AL
1      133.93     AK
2      110.35     AZ
3      142.39     AR
4      165.63     CA
5      139.91     CO
6      167.02     CT
7      151.48     DE
```

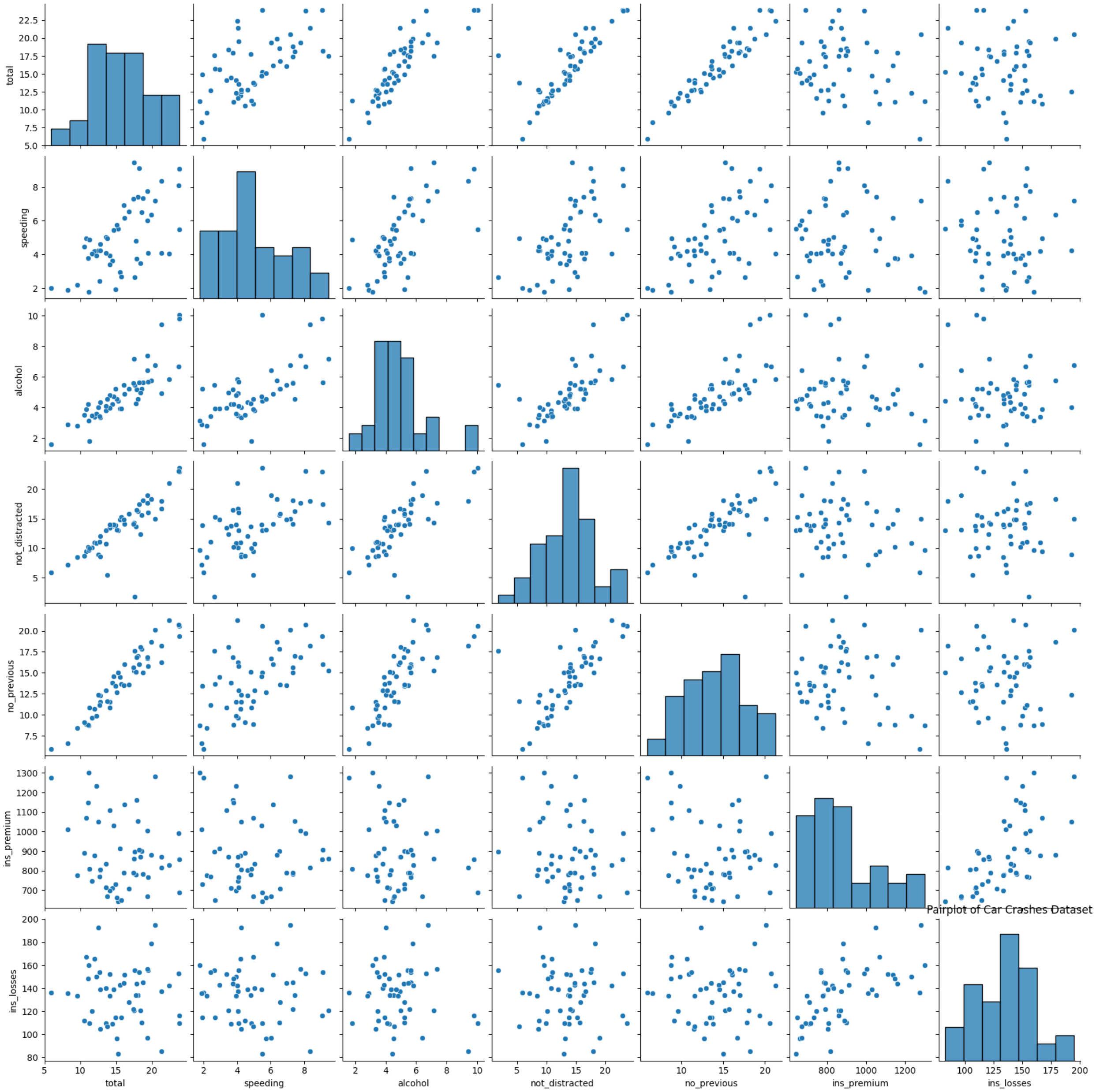
```
sns.scatterplot(x="total",y="speeding",data=dataset)
```

```
<Axes: xlabel='total', ylabel='speeding'>
```



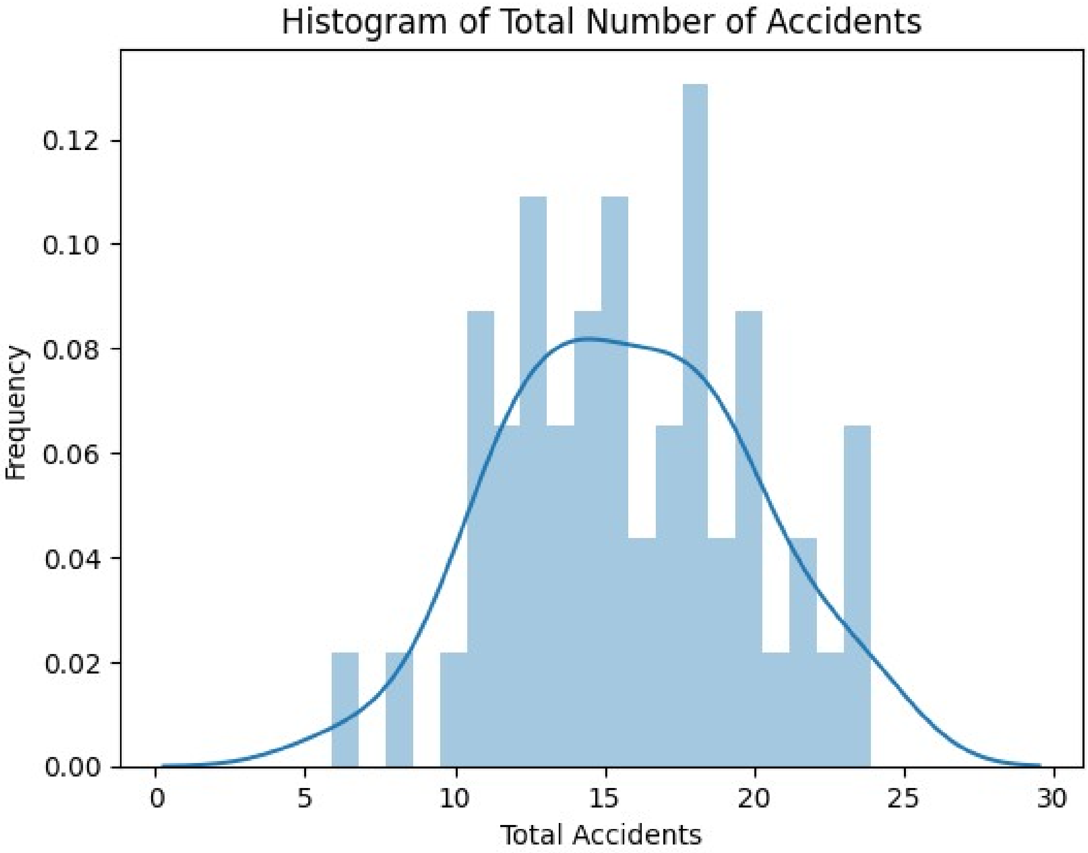
```
# Inference:from the plot we can say that as the total increases
speeding is  decreases
```

```
sns.pairplot(dataset)
plt.title("Pairplot of Car Crashes Dataset")
plt.show()
```



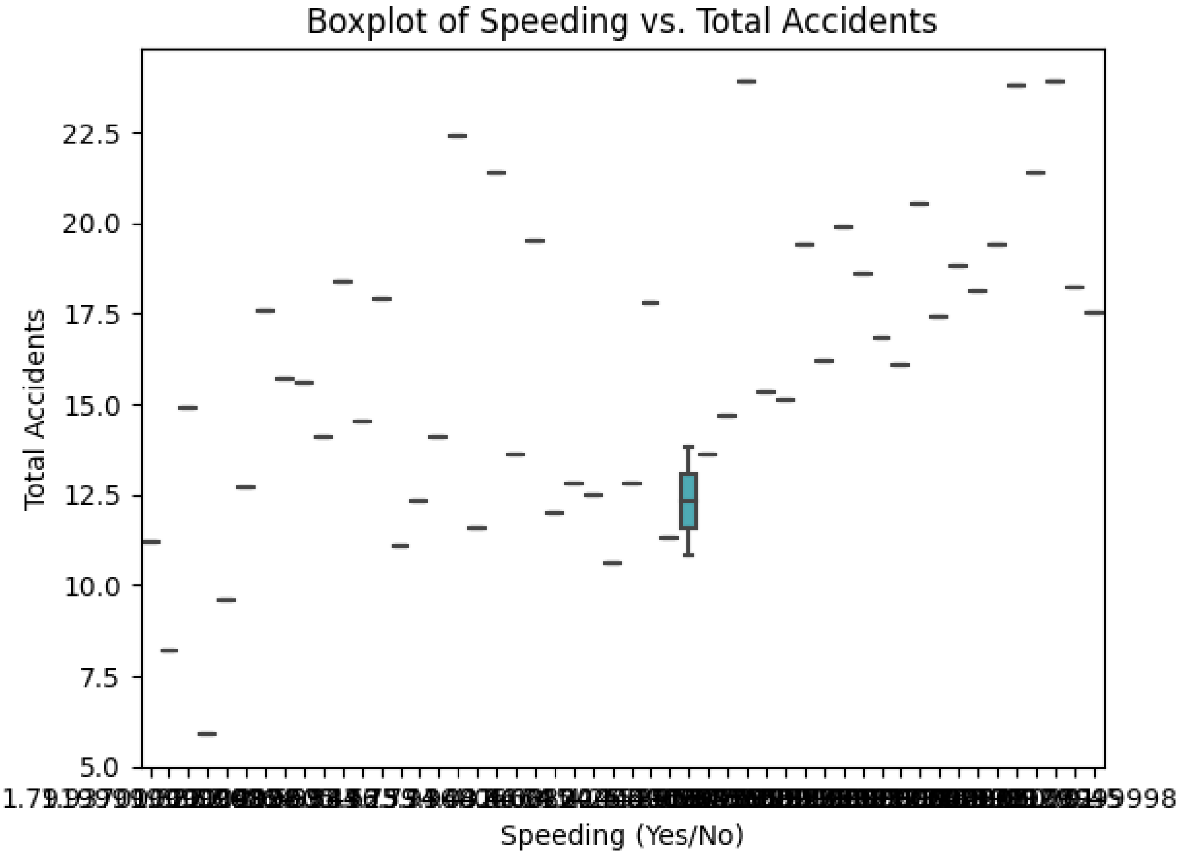
```
# Inference: The pairplot provides a quick overview of the
relationships between numeric variables in the dataset. It helps
identify potential correlations or patterns.

sns.distplot(dataset["total"], bins=20, kde=True)
plt.title("Histogram of Total Number of Accidents")
plt.xlabel("Total Accidents")
plt.ylabel("Frequency")
plt.show()
```

```
<ipython-input-24-c2887f4da83f>:1: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn
v0.14.0.

Please adapt your code to use either `displot` (a figure-level
function with
similar flexibility) or `histplot` (an axes-level function for
histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751

  sns.distplot(dataset["total"], bins=20, kde=True)
```



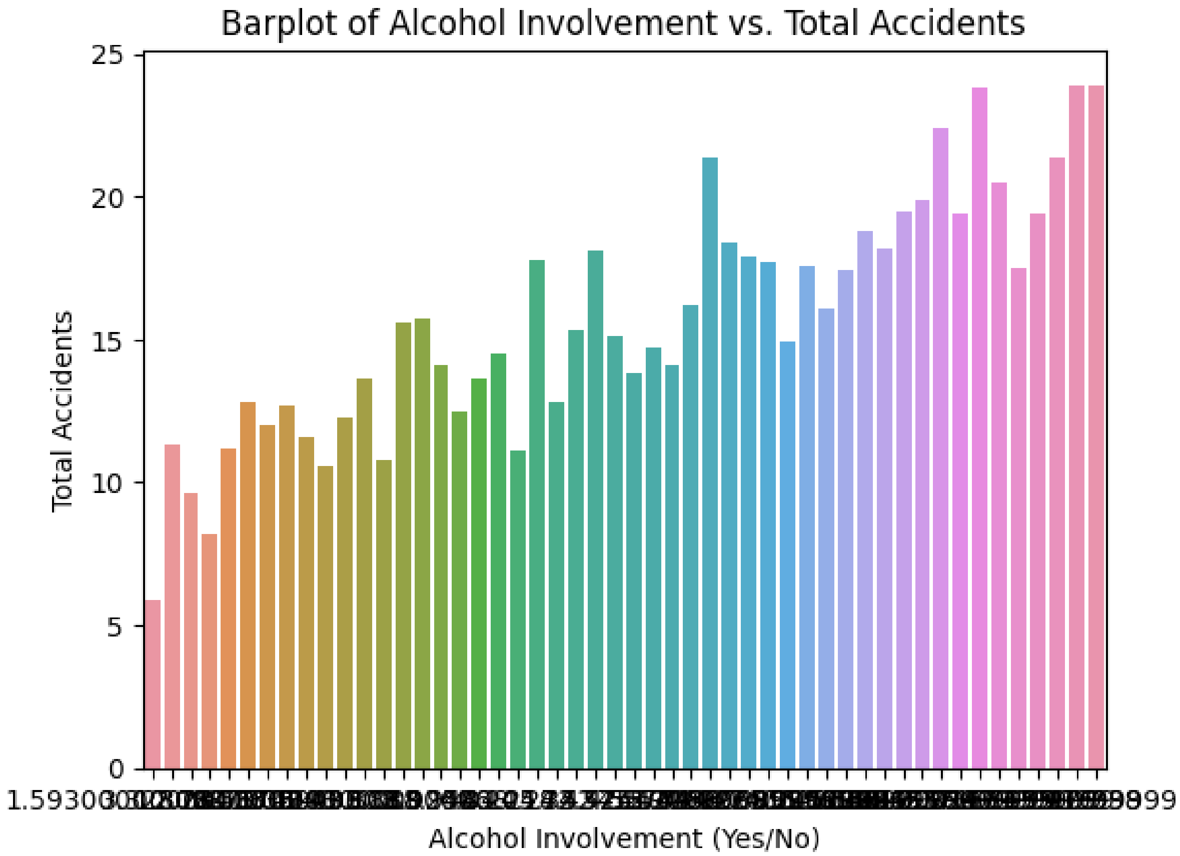
```
# Inference: The histogram shows the distribution of total accidents.
Most states have a relatively low number of accidents, with a few
outliers with significantly higher accident counts.
```

```python
sns.boxplot(x="speeding", y="total", data=dataset)
plt.title("Boxplot of Speeding vs. Total Accidents")
plt.xlabel("Speeding (Yes/No)")
plt.ylabel("Total Accidents")
plt.show()
```



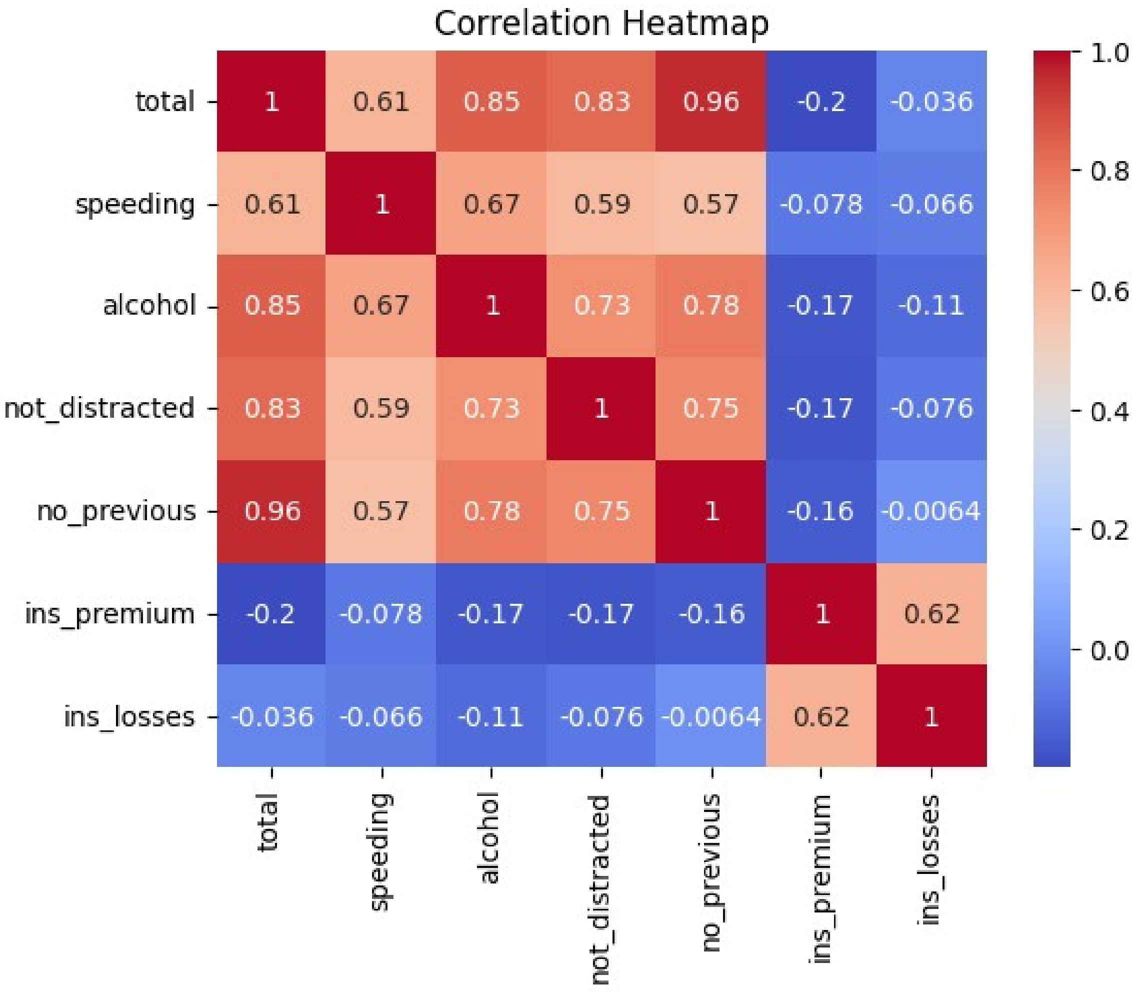
```python
# Inference: The boxplot illustrates the relationship between speeding
(yes/no) and the total number of accidents. It indicates that states
with higher speeding rates tend to have a higher median total number
of accidents.

sns.barplot(x="alcohol", y="total", data=dataset, ci=None)
plt.title("Barplot of Alcohol Involvement vs. Total Accidents")
plt.xlabel("Alcohol Involvement (Yes/No)")
plt.ylabel("Total Accidents")
plt.show()
```

```
<ipython-input-19-e9d4c62a021d>:1: FutureWarning:

The `ci` parameter is deprecated. Use `errorbar=None` for the same
effect.

  sns.barplot(x="alcohol", y="total", data=dataset, ci=None)
```



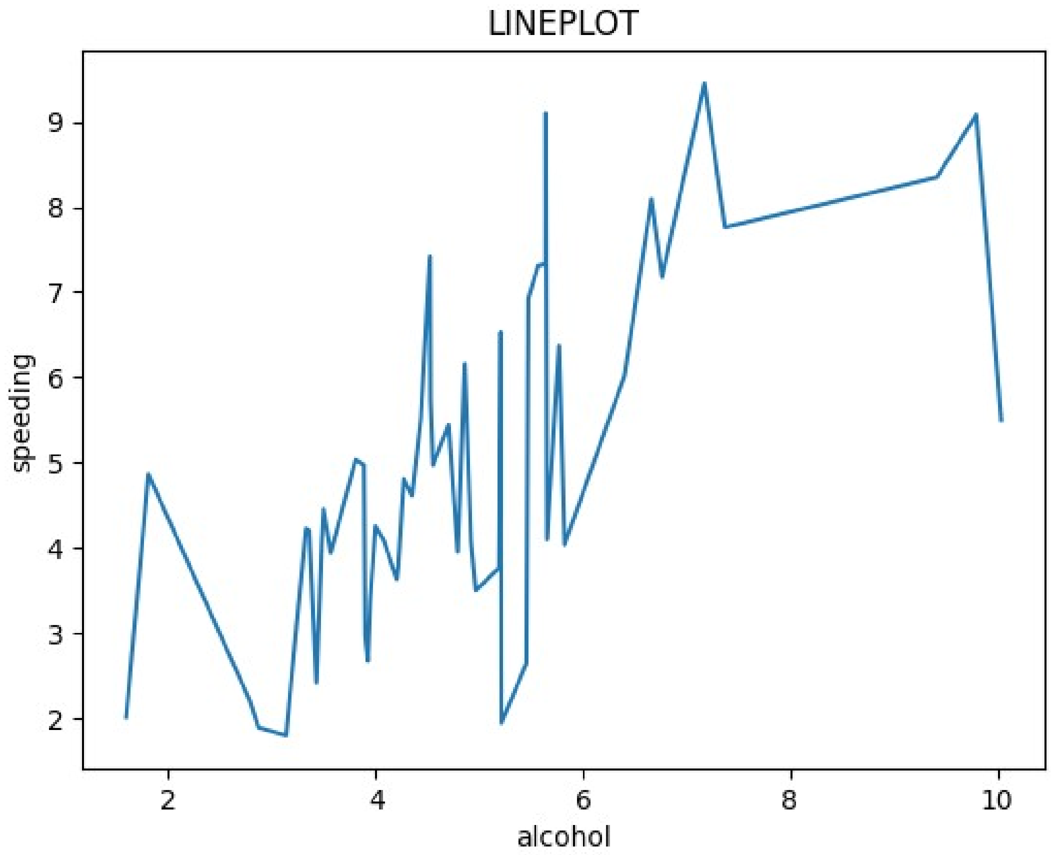
```
# Inference: The barplot compares the total number of accidents for
states with and without alcohol involvement. It suggests that states
with alcohol involvement tend to have a higher average number of
accidents.

correlation_matrix = dataset.corr()
sns.heatmap(correlation_matrix, annot=True, cmap="coolwarm")
plt.title("Correlation Heatmap")
plt.show()
```

```
<ipython-input-21-f966e5b914d1>:1: FutureWarning: The default value of
numeric_only in DataFrame.corr is deprecated. In a future version, it
will default to False. Select only valid columns or specify the value
of numeric_only to silence this warning.
  correlation_matrix = dataset.corr()
```



```
# Inference: The heatmap displays the correlation between numeric
variables in the dataset. Positive correlations are shown in warmer
colors, while negative correlations are in cooler colors. It helps
identify potential relationships between variables.

sns.lineplot(x="alcohol",y="speeding",data=dataset)
plt.title("LINEPLOT")
```

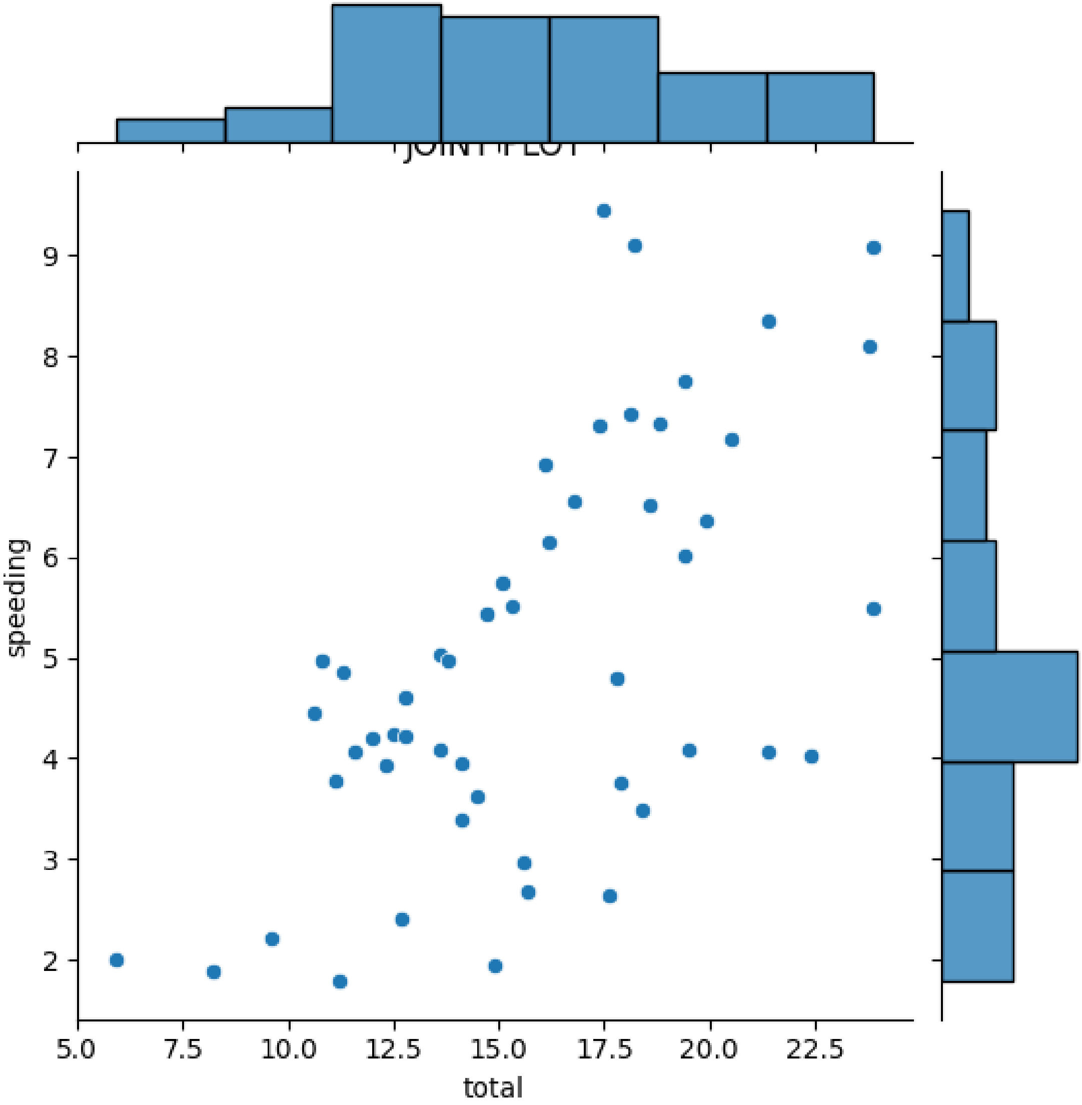
```
Text(0.5, 1.0, 'LINEPLOT')
```



```
# Inference: The line plot comparing "Alcohol" and "Speeding"
incidents in car crashes shows that  alcohol with higher value have
higher speeding value.
```

```
sns.jointplot(x="total",y="speeding",data=dataset)
plt.title("JOINT")
```

```
Text(0.5, 1.0, 'JOINT PLOT')
```



```
# INFERENCE :States with a higher rate of "Speeding" incidents tend to
have a wider range of total accidents, as indicated by the larger
interquartile range (IQR) and the presence of outliers.
```