b-satwik

September 14, 2023

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[3]:

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

[4]:

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

[4]:

```
    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
```

[5]:
```
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)
```

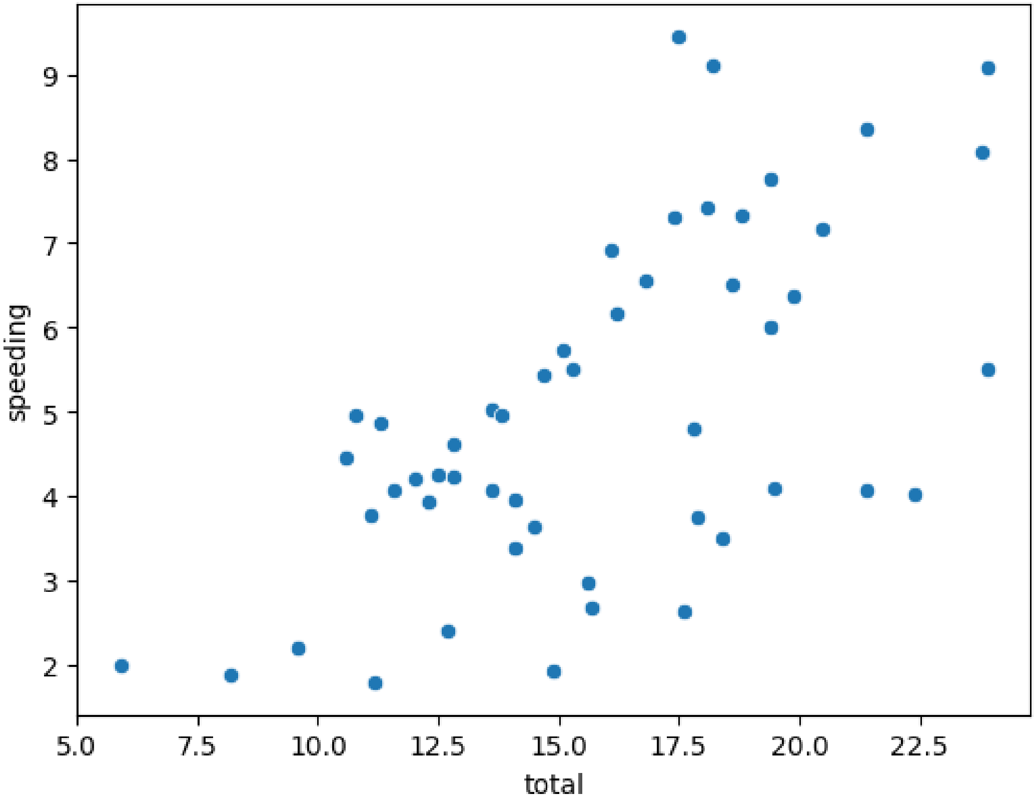
```
memory usage: 3.3+ KB
```

```
[6]: dataset.head(8)
```

```
[6]:    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
```

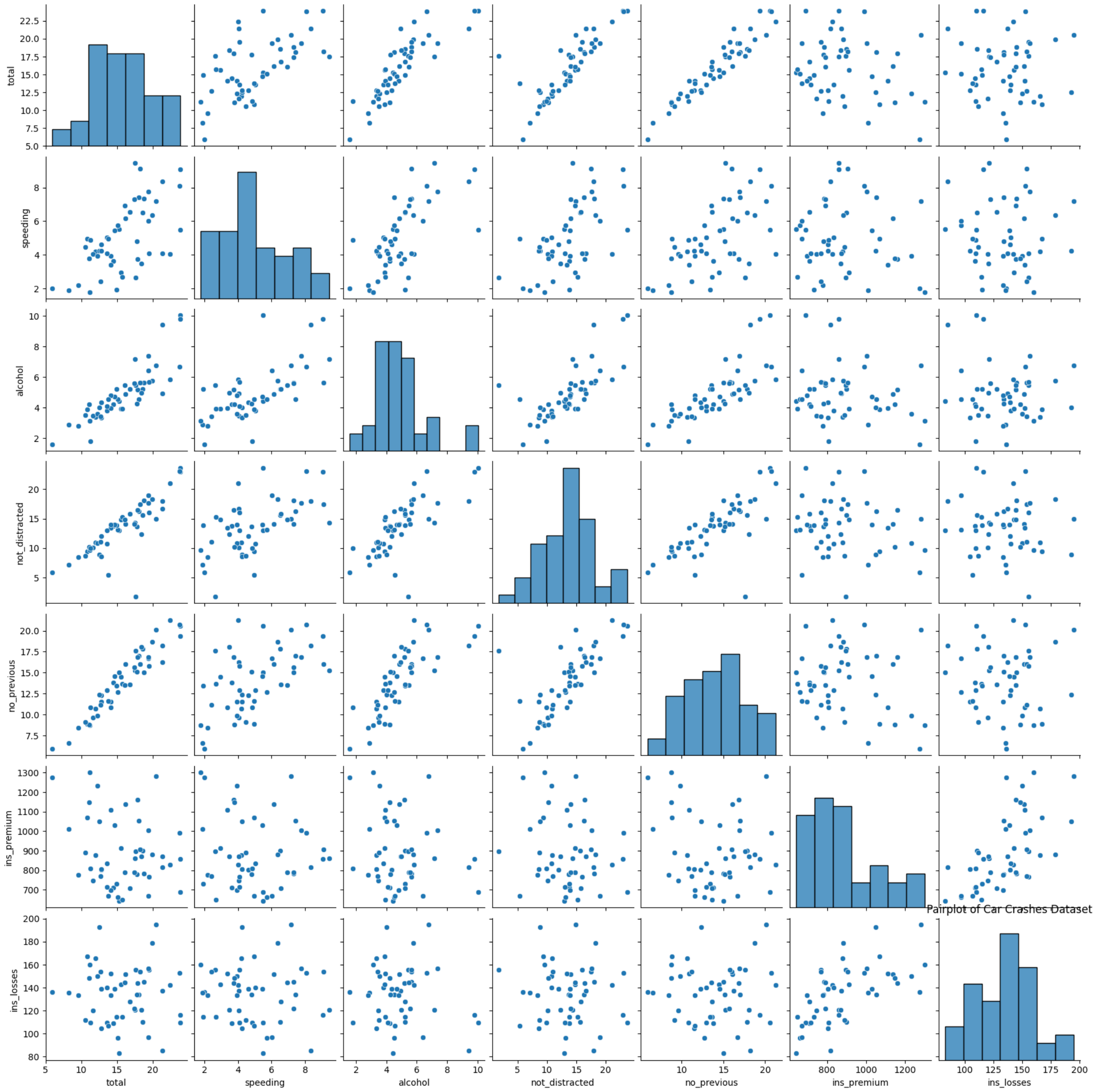
```
[7]: sns.scatterplot(x="total",y="speeding",data=dataset)
```

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



```
[8]: # Inference:from the plot we can say that as the total increases speeding is ␣
     ↪decreases
```

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

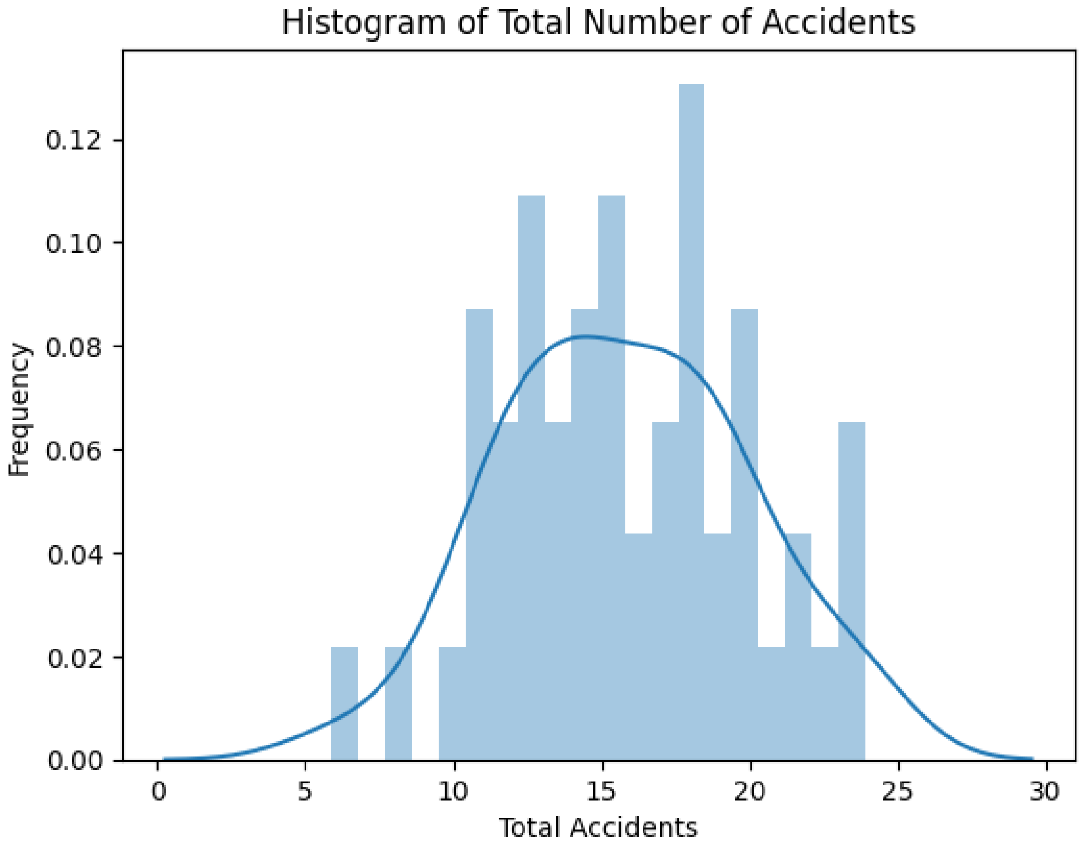


```
[11]: # Inference: The pairplot provides a quick overview of the relationships between numeric variables in the dataset. It helps identify potential correlations or patterns.
```

```
[24]: 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)
```

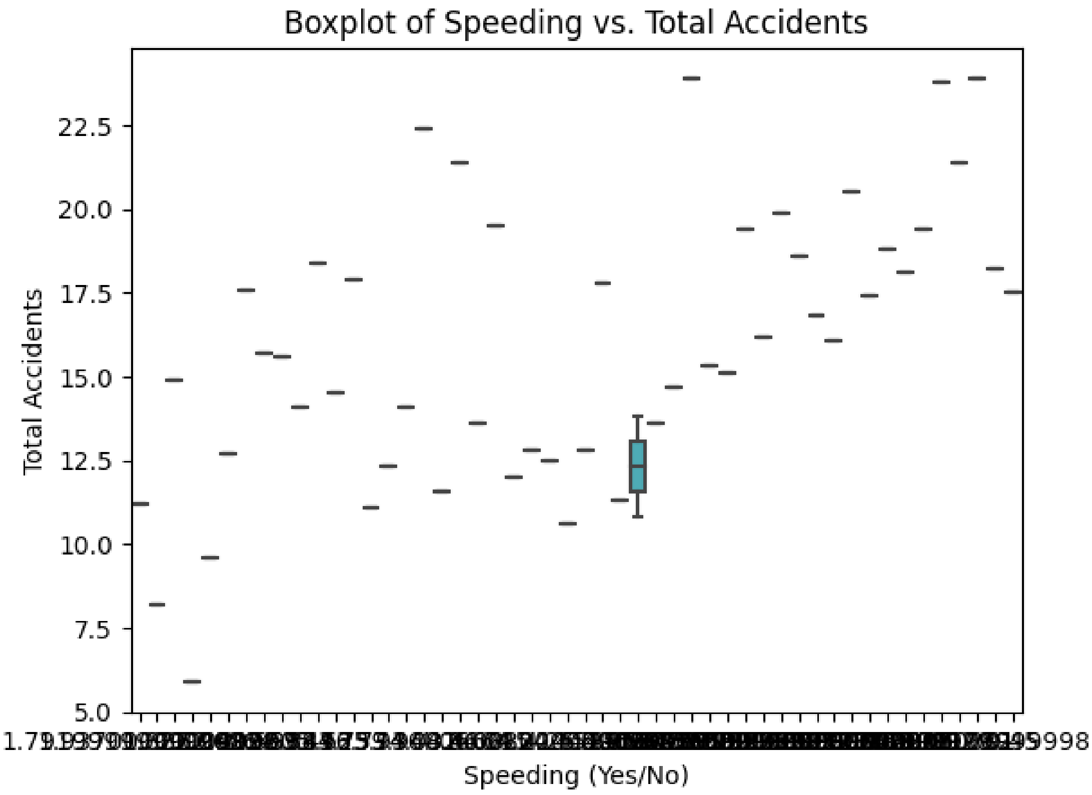


[13]:

```
# 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.
```

[15]:

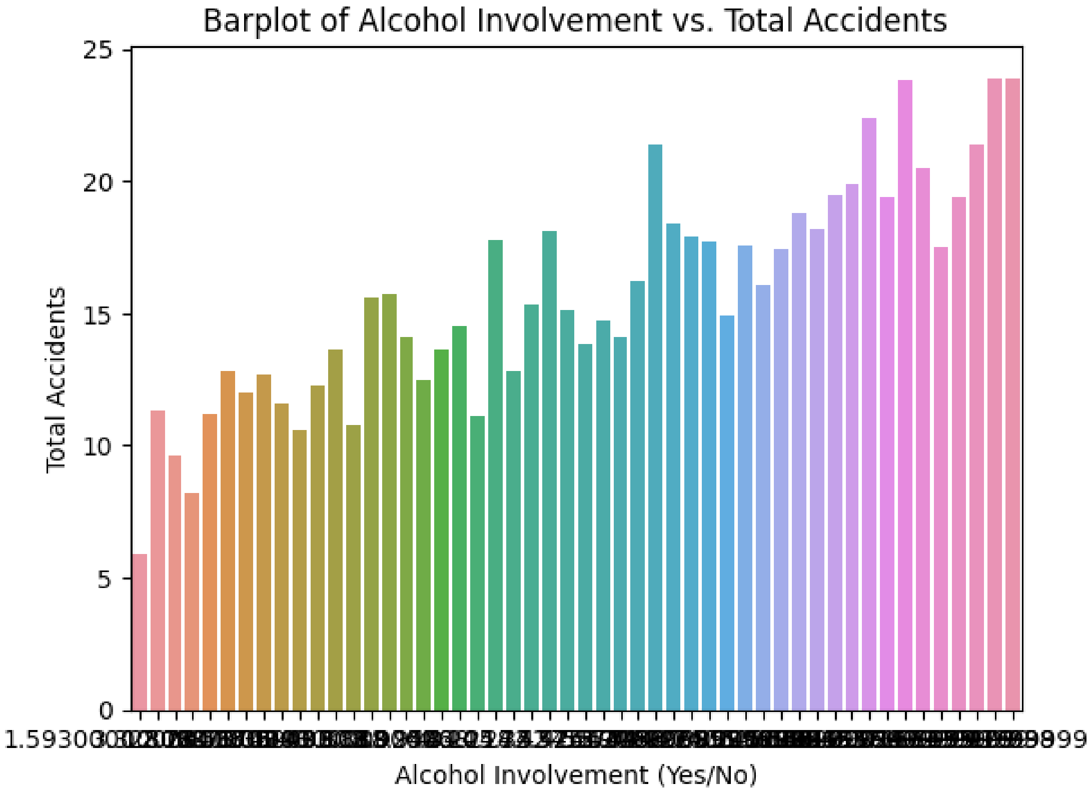
```
sns.boxplot(x="speeding", y="total", data=dataset)
plt.title("Boxplot of Speeding vs. Total Accidents")
plt.xlabel("Speeding (Yes/No)")
plt.ylabel("Total Accidents")
plt.show()
```



[16]:
```
# 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.
```

[19]:
```
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()
```

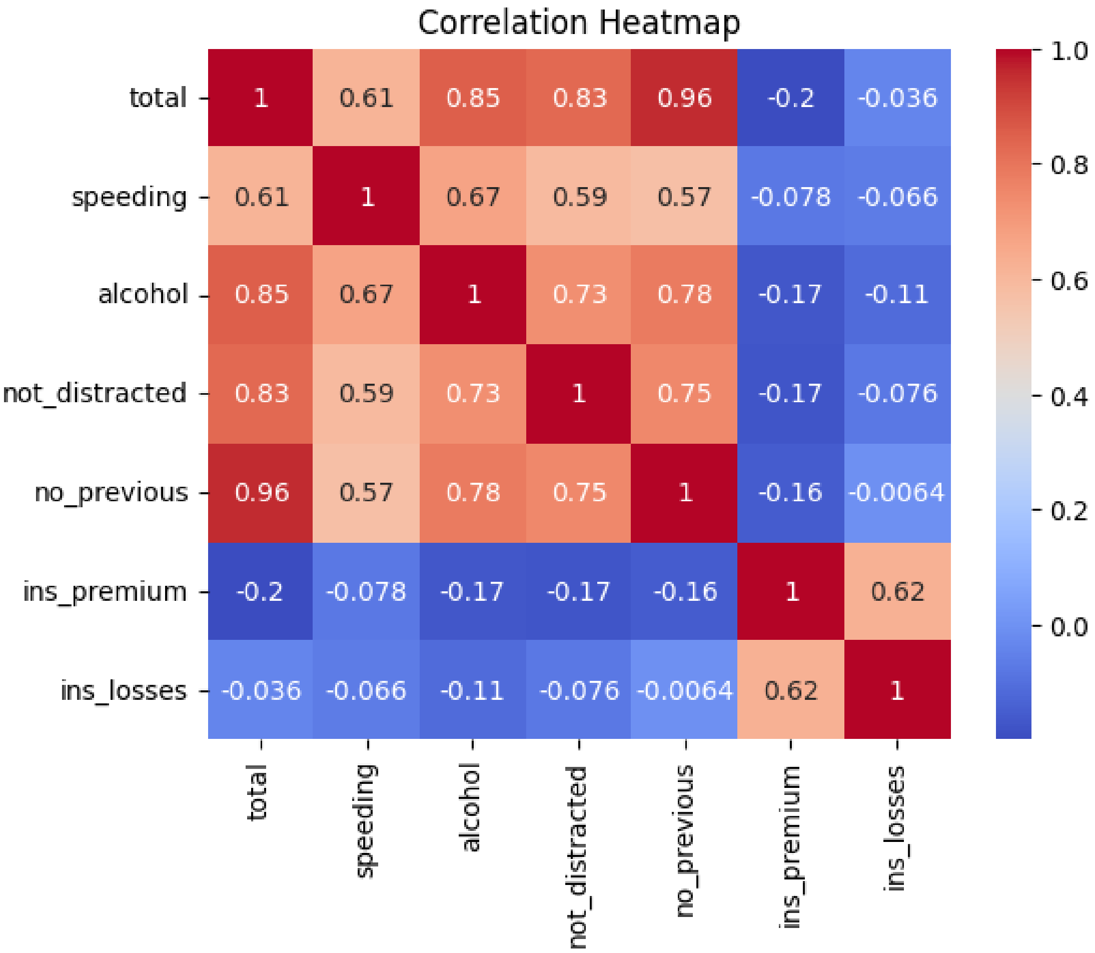
```
<ipython-input-19-e9d4c62a021d>:1: FutureWarning:

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

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



[18]:
```
# 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.
```

[21]:
```
correlation_matrix = dataset.corr()
sns.heatmap(correlation_matrix, annot=True, cmap="coolwarm")
plt.title("Correlation Heatmap")
plt.show()
```

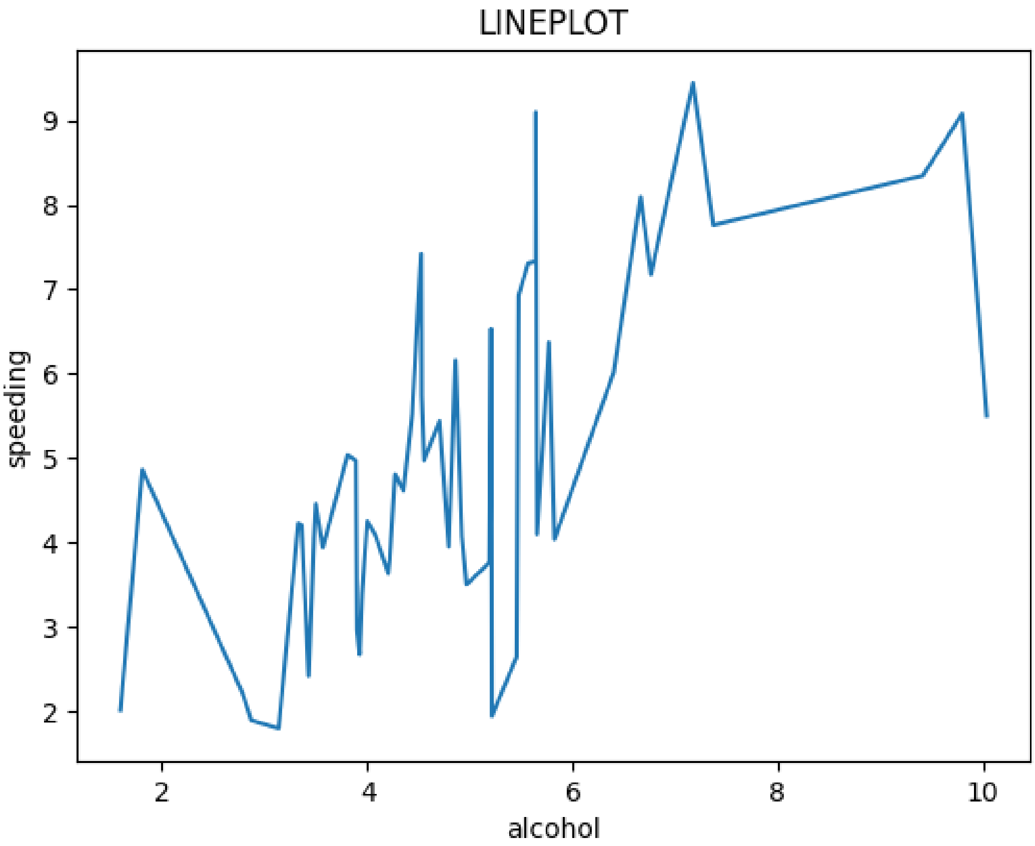
```
<ipython-input-21-f966e5b914d1>:1: FutureWarning: The default value of
numeric_only in DataFrame.corr is deprecated. In a future version, it will
default to False. Select only valid columns or specify the value of numeric_only
to silence this warning.
  correlation_matrix = dataset.corr()
```



[22]:
```
# 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.
```

[26]:
```
sns.lineplot(x="alcohol",y="speeding",data=dataset)
plt.title("LINEPLOT")
```

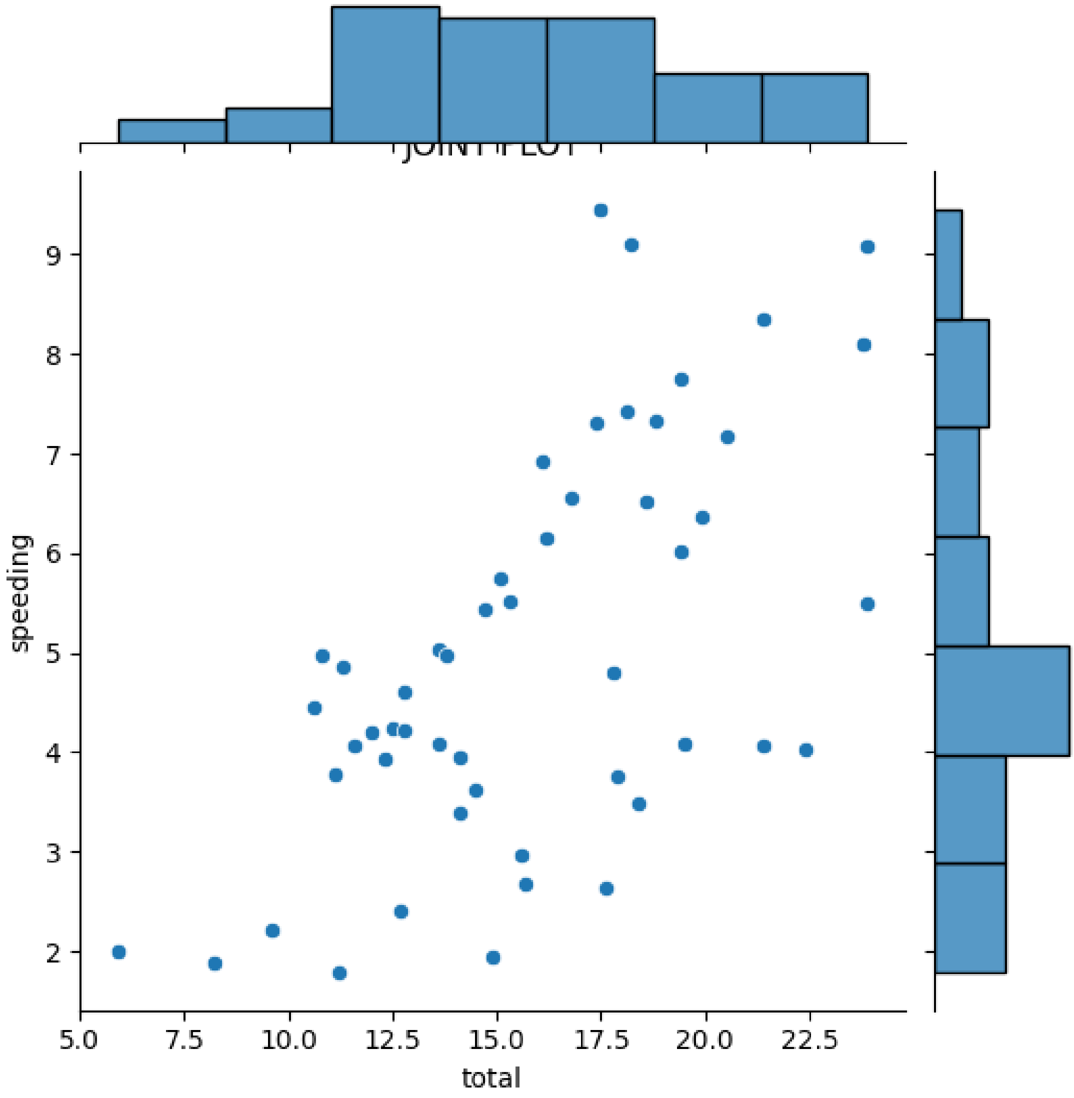
[26]:
```
Text(0.5, 1.0, 'LINEPLOT')
```



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

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

```
[27]: Text(0.5, 1.0, 'JOINT PLOT')
```



[28]:
```
# 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.
```

[ ]: