# ASSIGNMENT-2

# R.SAMHITHA-21BCB7025

```
pip install seaborn  #library installed
```

```
Requirement already satisfied: seaborn in c:\users\tejos\anaconda\lib\
site-packages (0.12.2)
Requirement already satisfied: numpy!=1.24.0,>=1.17 in c:\users\tejos\
anaconda\lib\site-packages (from seaborn) (1.24.3)
Requirement already satisfied: pandas>=0.25 in c:\users\tejos\
anaconda\lib\site-packages (from seaborn) (1.5.3)
Requirement already satisfied: matplotlib!=3.6.1,>=3.1 in c:\users\
tejos\anaconda\lib\site-packages (from seaborn) (3.7.1)
Requirement already satisfied: contourpy>=1.0.1 in c:\users\tejos\
anaconda\lib\site-packages (from matplotlib!=3.6.1,>=3.1->seaborn)
(1.0.5)
Requirement already satisfied: cycler>=0.10 in c:\users\tejos\
anaconda\lib\site-packages (from matplotlib!=3.6.1,>=3.1->seaborn)
(0.11.0)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\tejos\
anaconda\lib\site-packages (from matplotlib!=3.6.1,>=3.1->seaborn)
(4.25.0)
Requirement already satisfied: kiwisolver>=1.0.1 in c:\users\tejos\
anaconda\lib\site-packages (from matplotlib!=3.6.1,>=3.1->seaborn)
(1.4.4)
Requirement already satisfied: packaging>=20.0 in c:\users\tejos\
anaconda\lib\site-packages (from matplotlib!=3.6.1,>=3.1->seaborn)
(23.0)
Requirement already satisfied: pillow>=6.2.0 in c:\users\tejos\
anaconda\lib\site-packages (from matplotlib!=3.6.1,>=3.1->seaborn)
(9.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in c:\users\tejos\
anaconda\lib\site-packages (from matplotlib!=3.6.1,>=3.1->seaborn)
(3.0.9)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\tejos\
anaconda\lib\site-packages (from matplotlib!=3.6.1,>=3.1->seaborn)
(2.8.2)
Requirement already satisfied: pytz>=2020.1 in c:\users\tejos\
anaconda\lib\site-packages (from pandas>=0.25->seaborn) (2022.7)
Requirement already satisfied: six>=1.5 in c:\users\tejos\anaconda\
lib\site-packages (from python-dateutil>=2.7->matplotlib!=3.6.1,>=3.1-
>seaborn) (1.16.0)
Note: you may need to restart the kernel to use updated packages.
```

```
import matplotlib.pyplot as plt #import the matplotlib.pyplot module
and alias it as plt.
```

```
import seaborn as sns  #import the seaborn library and alias it as
'sns'

print(sns.get_dataset_names()) #car_crashes is the inbuilt dataset
which we import
```

```
['anagrams', 'anscombe', 'attention', 'brain_networks', 'car_crashes',
'diamonds', 'dots', 'dowjones', 'exercise', 'flights', 'fmri',
'geyser', 'glue', 'healthexp', 'iris', 'mpg', 'penguins', 'planets',
'seaice', 'taxis', 'tips', 'titanic']
```

```
df=sns.load_dataset('car_crashes') # load the 'car_crashes' dataset
from seaborn and assign it to the variable 'df'

df #'df' contains the 'car_crashes' dataset, which provides
information about car crash statistics.
```

```
    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
```

```
df.info()  # Display information about the DataFrame 'df', including
data types, non-null counts, and memory usage.
```

```
<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
```

```
df.head(5)  # Display the first 5 rows of the DataFrame 'df' to
provide an overview of its data.
```

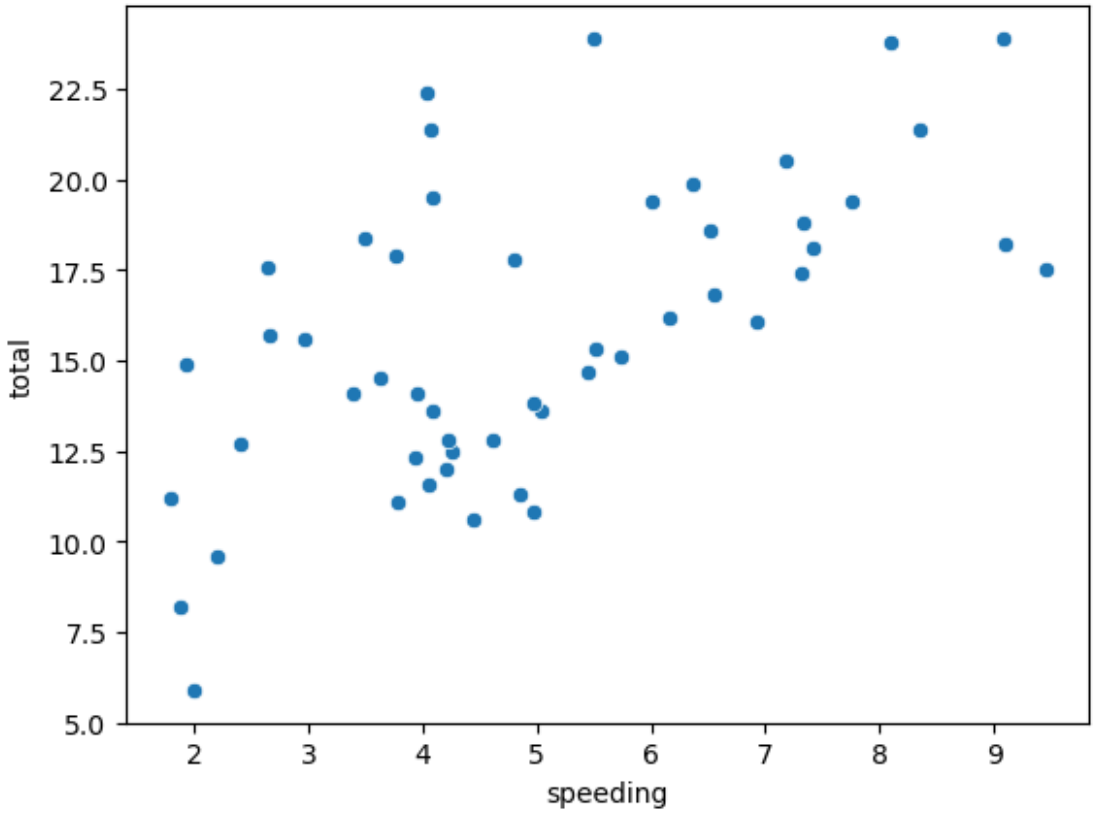
```
   total  speeding  alcohol  not_distracted  no_previous  ins_premium
\
0   18.8     7.332    5.640          18.048       15.040       784.55

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
```

```
   ins_losses abbrev
0      145.08     AL
1      133.93     AK
2      110.35     AZ
3      142.39     AR
4      165.63     CA
```

```
sns.scatterplot(x="speeding",y="total",data=df)  # Create a scatter
plot to visualize the relationship between speeding-related crashes
and total crashes.
# As the number of speeding-related crashes increases, the total
number of crashes also tends to increase
```

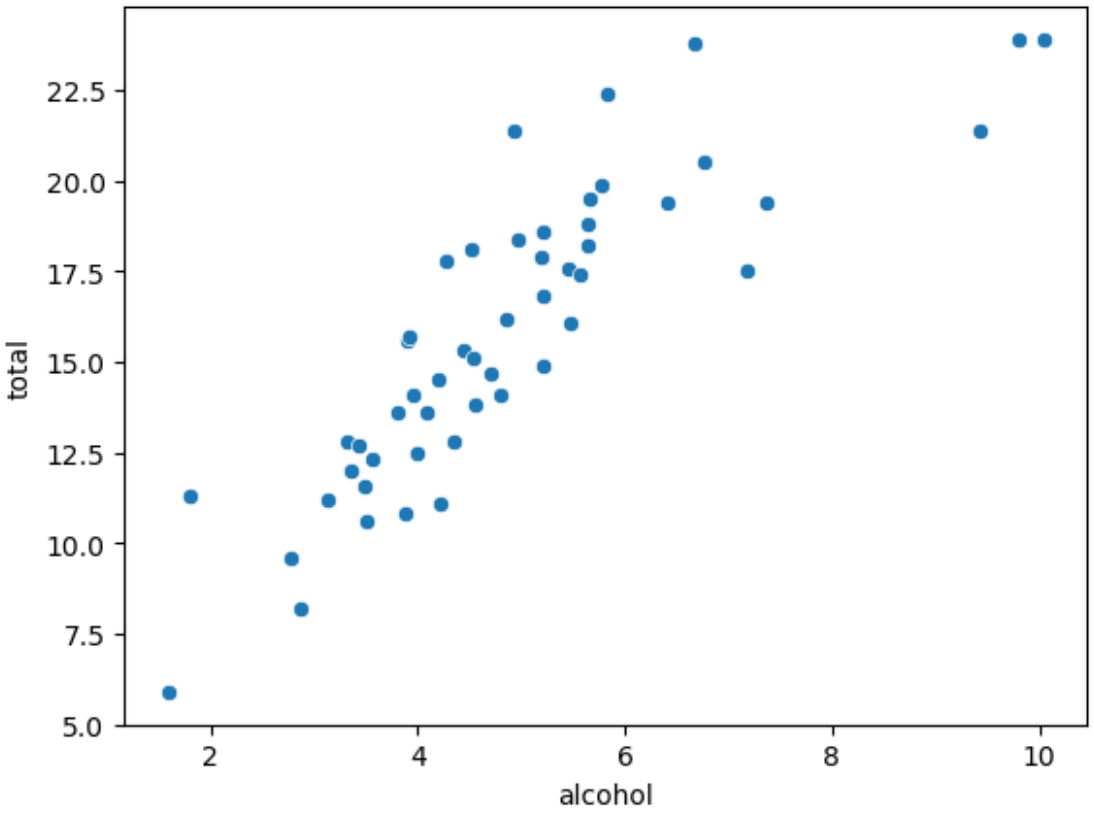
```
<Axes: xlabel='speeding', ylabel='total'>
```




```
sns.scatterplot(x="alcohol",y="total",data=df) # Create a scatter plot
to visualize the relationship between alcohol-related crashes and
total crashes.
```

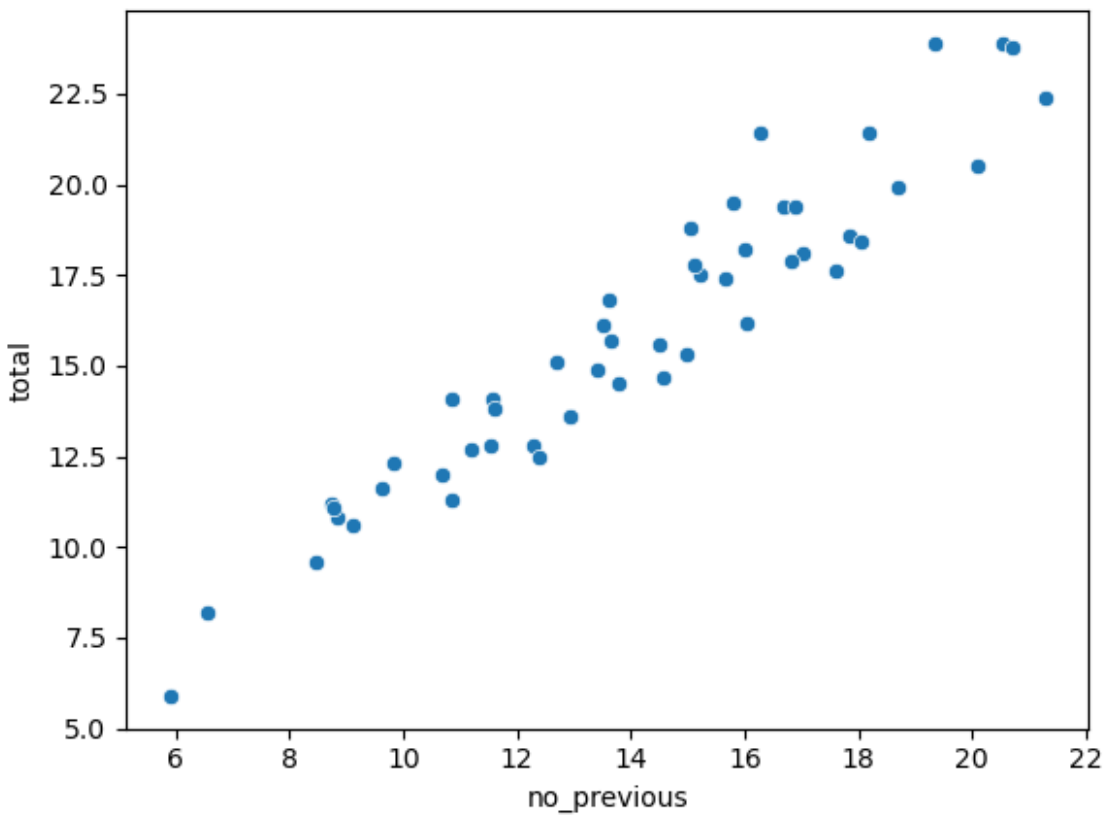
```
# As the number of alcohol-related crashes increases, the total number of crashes also tends to increase
```

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



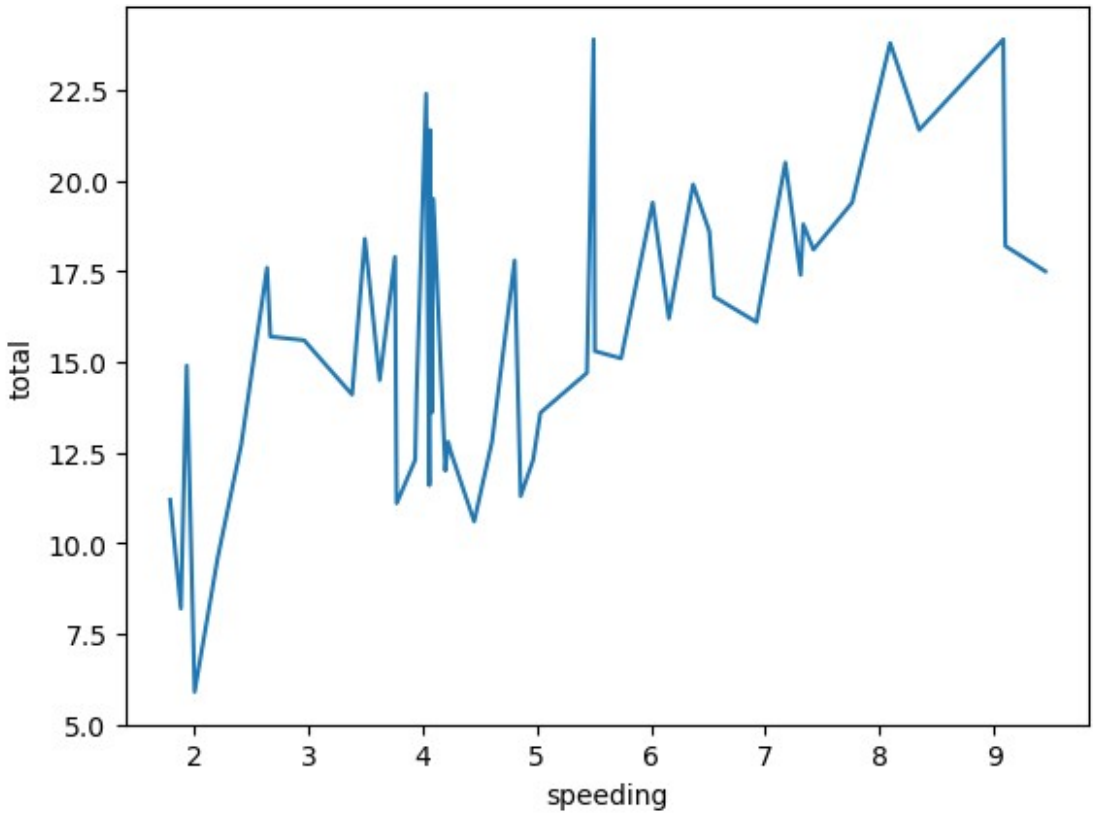

```
sns.scatterplot(x="no_previous",y="total",data=df)
```

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



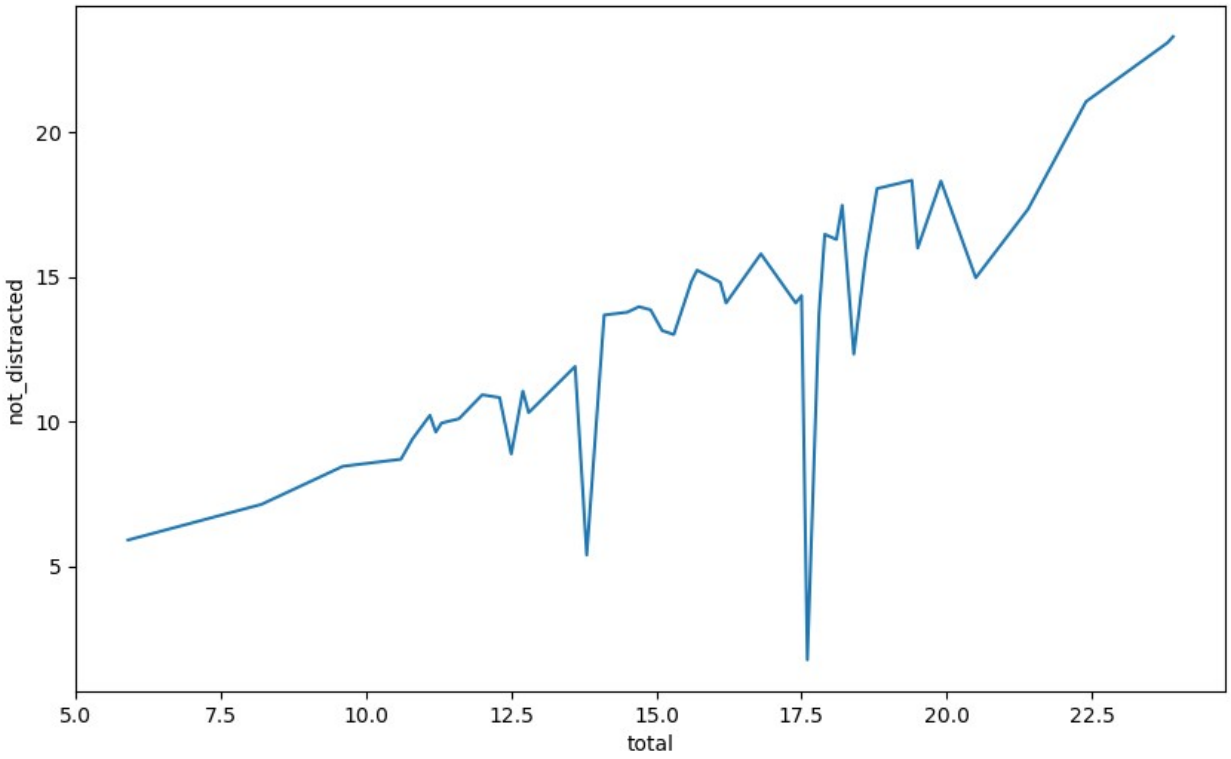

```
sns.lineplot(x="speeding",y="total",data=df,errorbar=None)
```

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




```
#this line plots provides an initial visual insight into the
relationship between speeding and car crashes
#speed increases the total car crashes by the above plot

plt.figure(figsize=(10, 6))
sns.lineplot(data=df, x='total',
y='not_distracted',errorbar=None)#error bar is used since data
contains a string type data
```

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

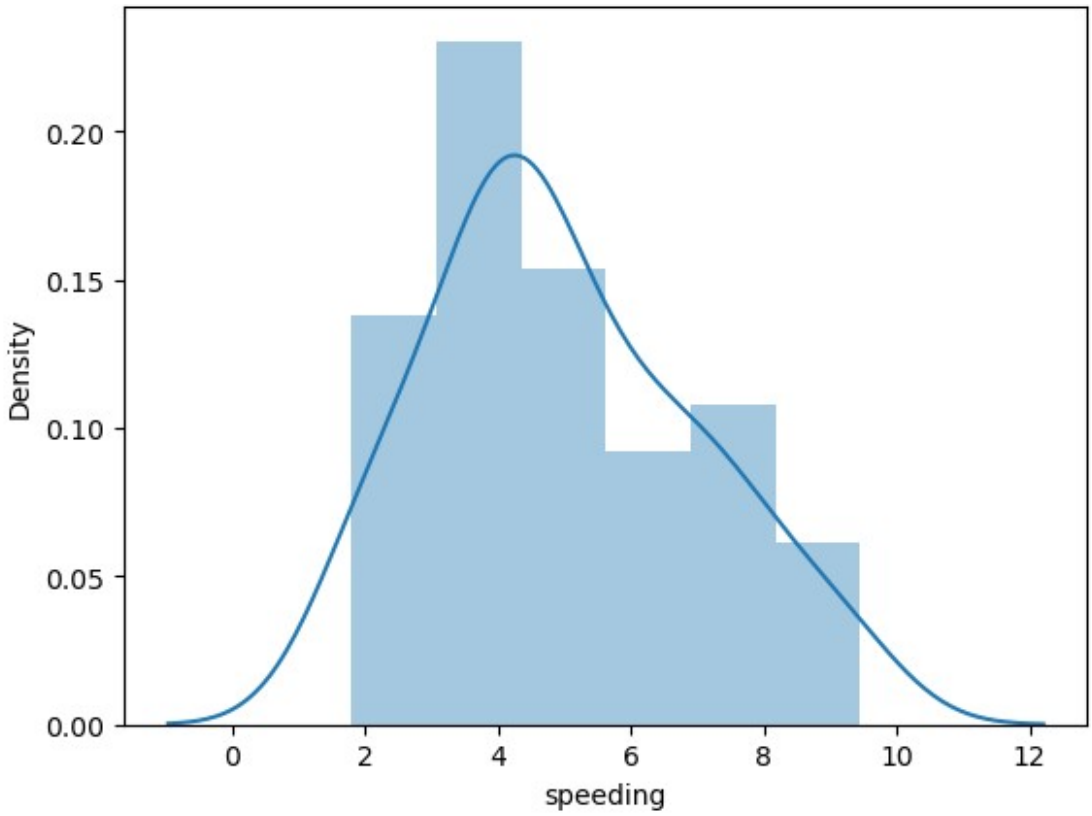



```
#The line plot suggests a relationship between the 'total' (possibly
total car crashes or incidents) and 'not_distracted' (possibly
incidents where there were no distracted accidents) variables
#as the increase in not_distracted increases the total car crashes
increases
```

```
sns.distplot(df["speeding"])
```

```
C:\Users\tejos\AppData\Local\Temp\ipykernel_18468\2127910581.py: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(df["speeding"])
```

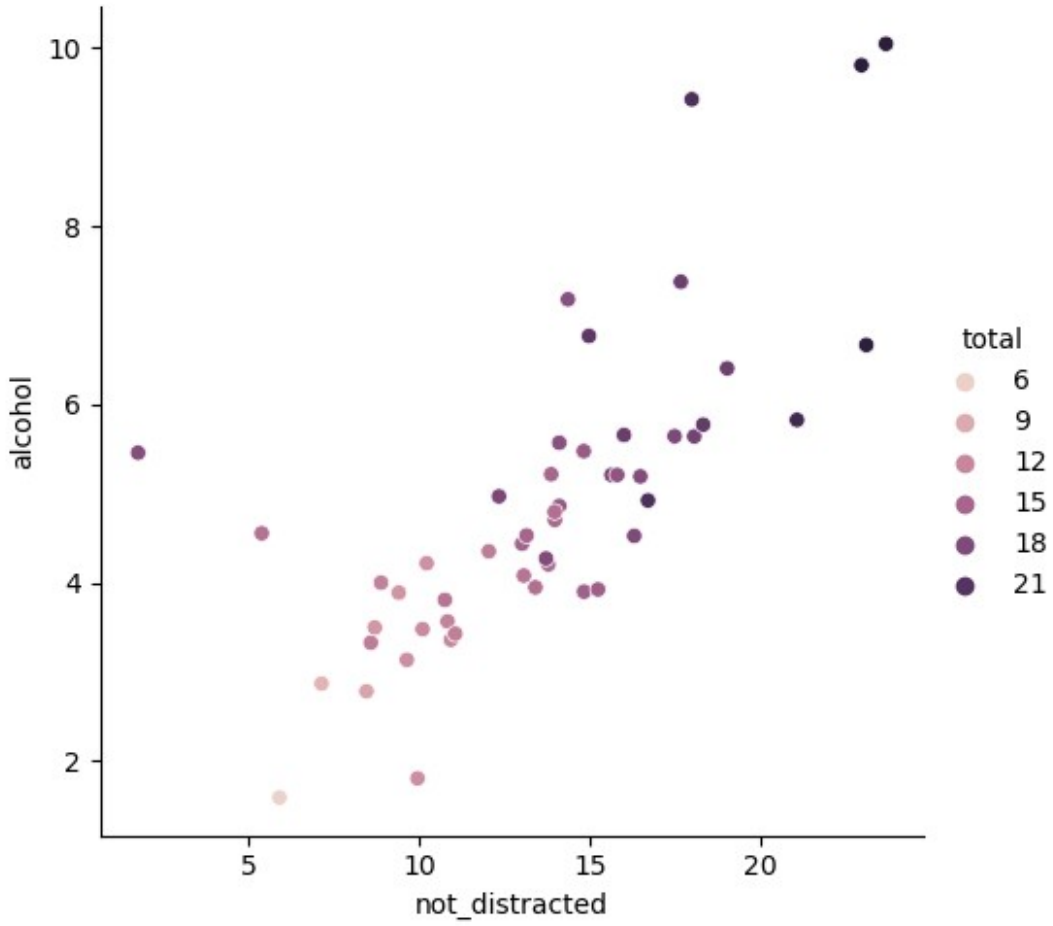
```
<Axes: xlabel='speeding', ylabel='Density'>
```




```
#this plot helps you understand the distribution of the "speeding"
data,including the central tendency(e.g.,where the data tends to
cluster)and any patterns,such as whether it follows a normal
distribution,is skewed,or has multiple modes.
#data represented in the histogram is roughly symmetrically
distributed around a central value,and the histogram takes on a shape
that resembles a bell curve.
#this curve is bell shaped.
```

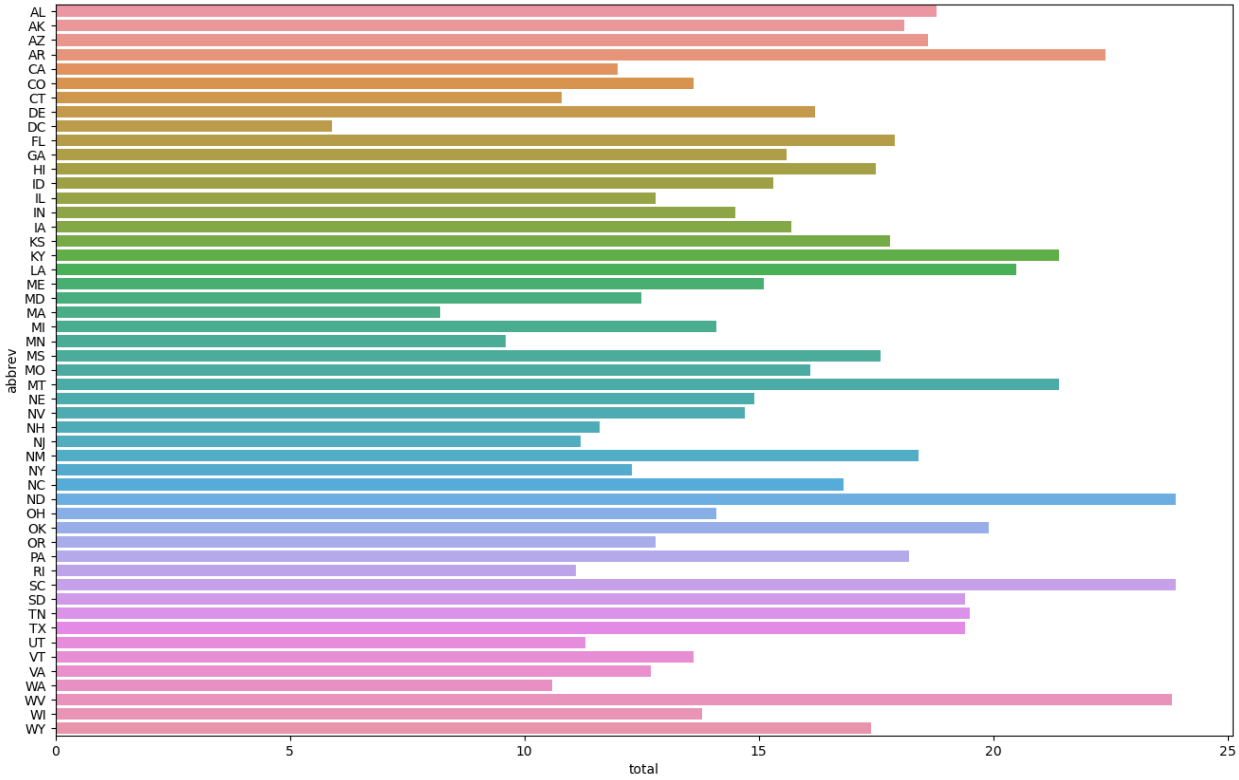
```
sns.relplot(x="not_distracted",y="alcohol",data=df,hue="total")
```

```
<seaborn.axisgrid.FacetGrid at 0x204df05f050>
```



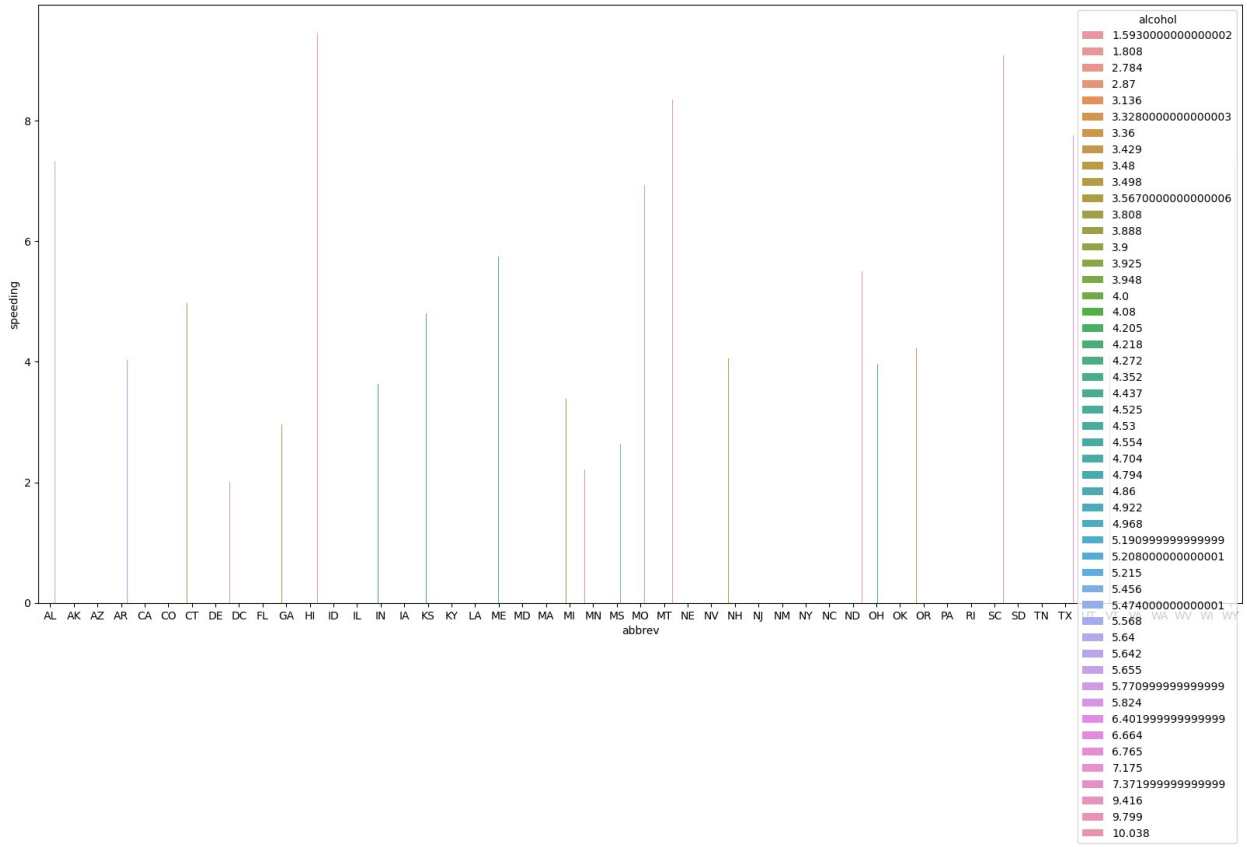

```
#this plot will display the datapoints with "not_distracted" values on
x-axis, "alcohol" values on y-axis,and use different colors to
distinguish between different categories or values in the "total"
column.

plt.subplots(figsize=(16,10))
sns.barplot(x='total',y= 'abbrev',data=df)
```

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



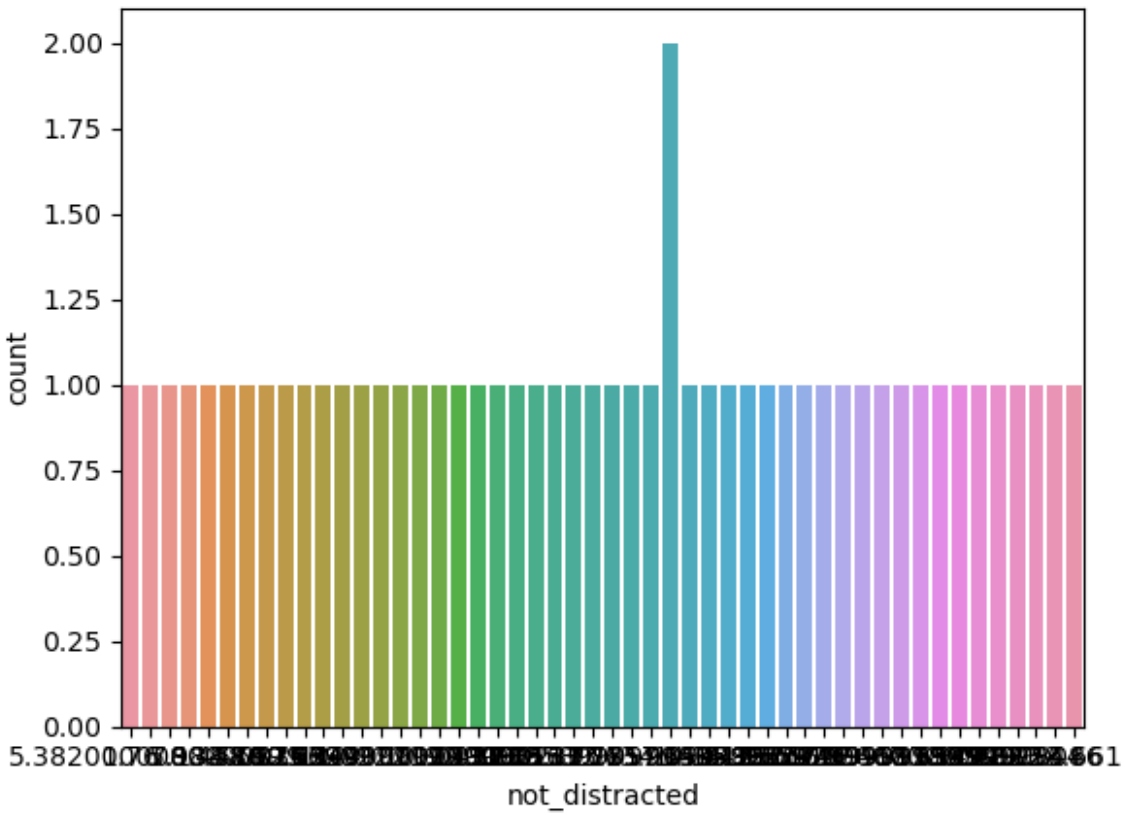

```
# the resulting barplot will display bars for each unique value in the "abbrev" column(assuming 'abbrev'represents abbreviations or labels),with the height of each bar corresponding to the 'total'value associated with that abbreviation.

plt.figure(figsize=(20, 10)) #adjust the figure size as needed
sns.barplot(data=df, x='abbrev', y='speeding', hue='alcohol')
```

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



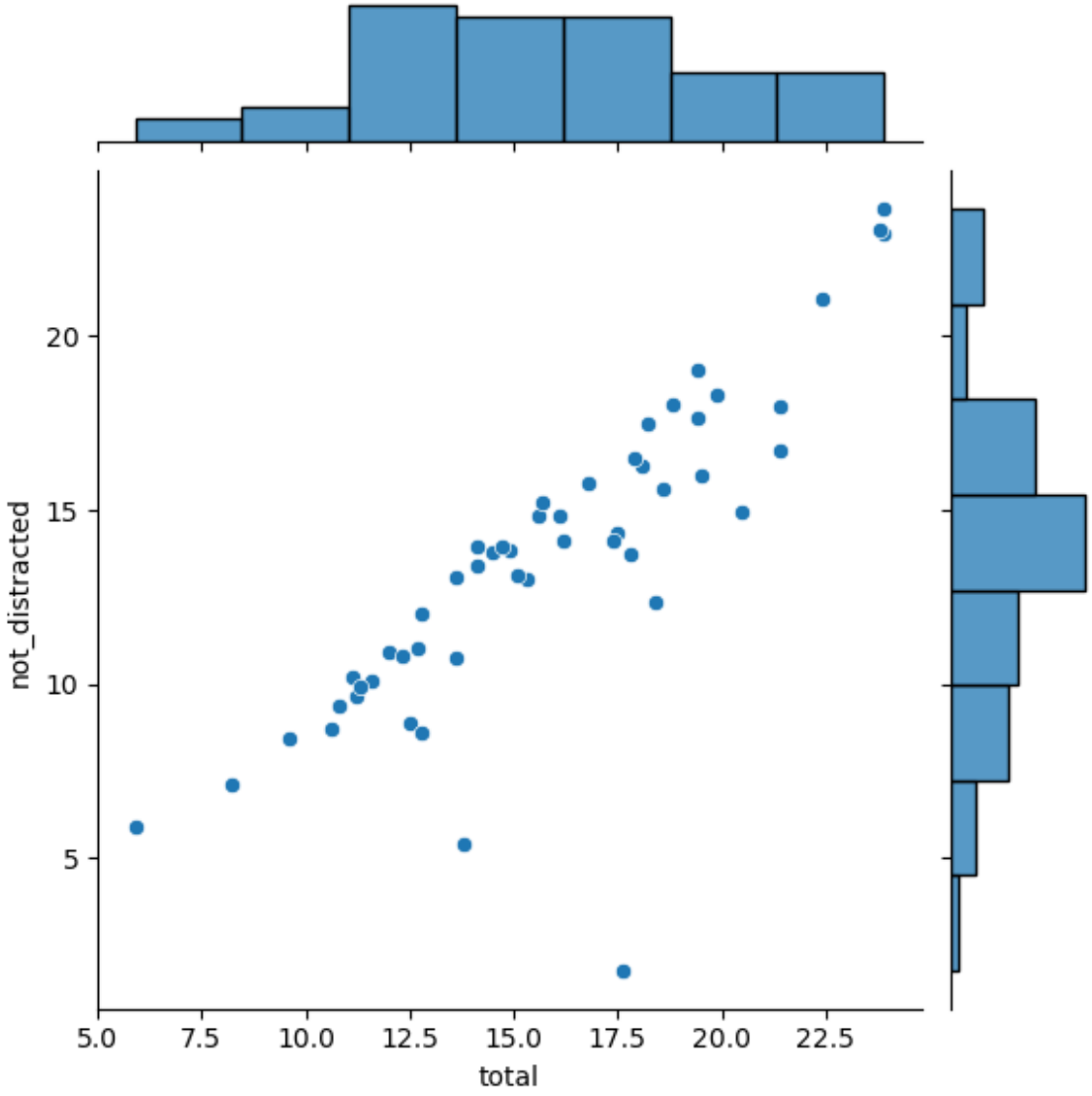

```
#creating a seaborn barplot with a larger figure size(width:20 units,height:10 units)to visualize the relationship between the 'speeding'column and the 'abbrev'column,with the 'alcohol'column for the hue.

sns.countplot(x="not_distracted",data=df)
```

```
<Axes: xlabel='not_distracted', ylabel='count'>
```



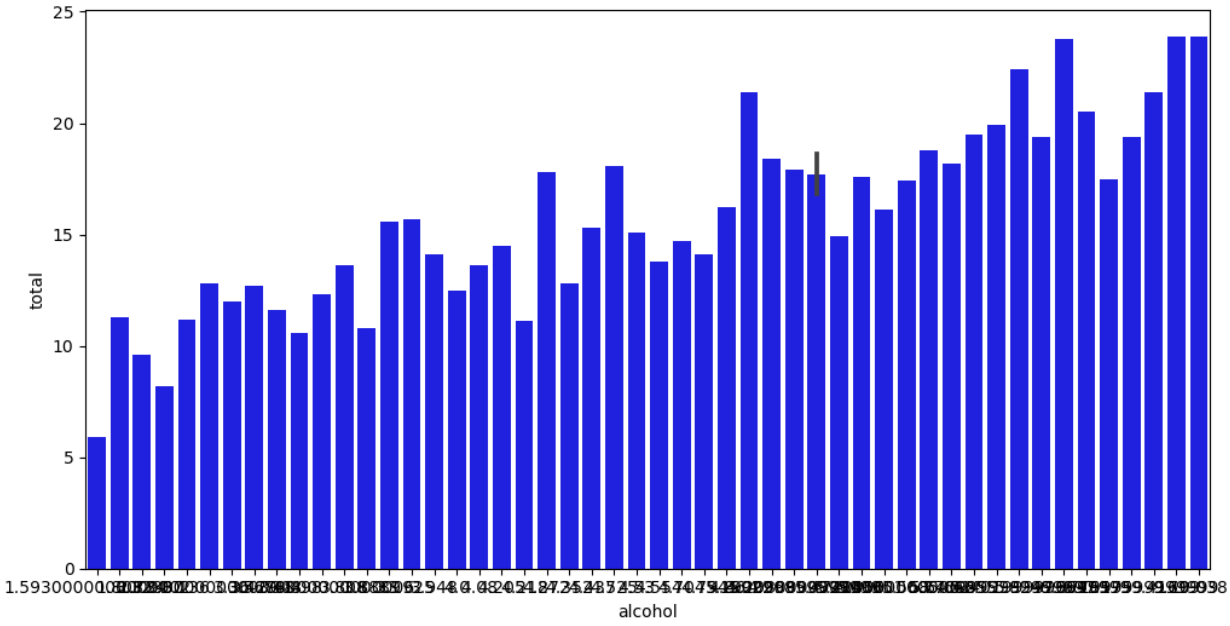

```
#the resulting countplot displays bars fo each unique value in the
"not_distracted" column,showing the frequency or count of each
category
#we can also see the same count in the value count.

sns.jointplot(x="total",y="not_distracted",data=df)
```

```
<seaborn.axisgrid.JointGrid at 0x204f20801d0>
```



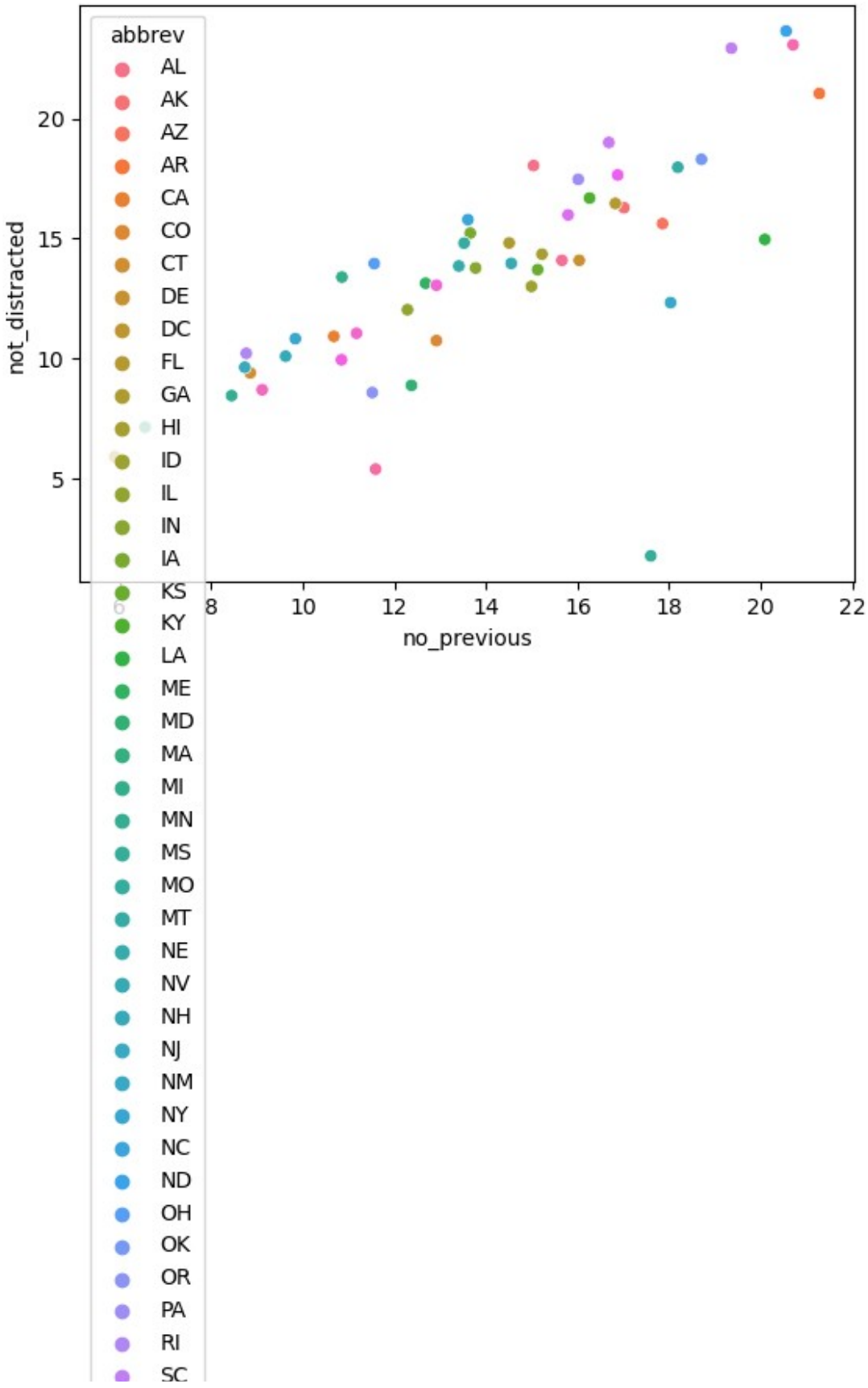

```
#the resulting jointplot provides several insights into the
relationship between the "total" and "not_distracted" columns.

plt.figure(figsize=(12, 6))
sns.barplot(data=df, x='alcohol', y='total', color='blue',
label='Total Crashes')
```

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



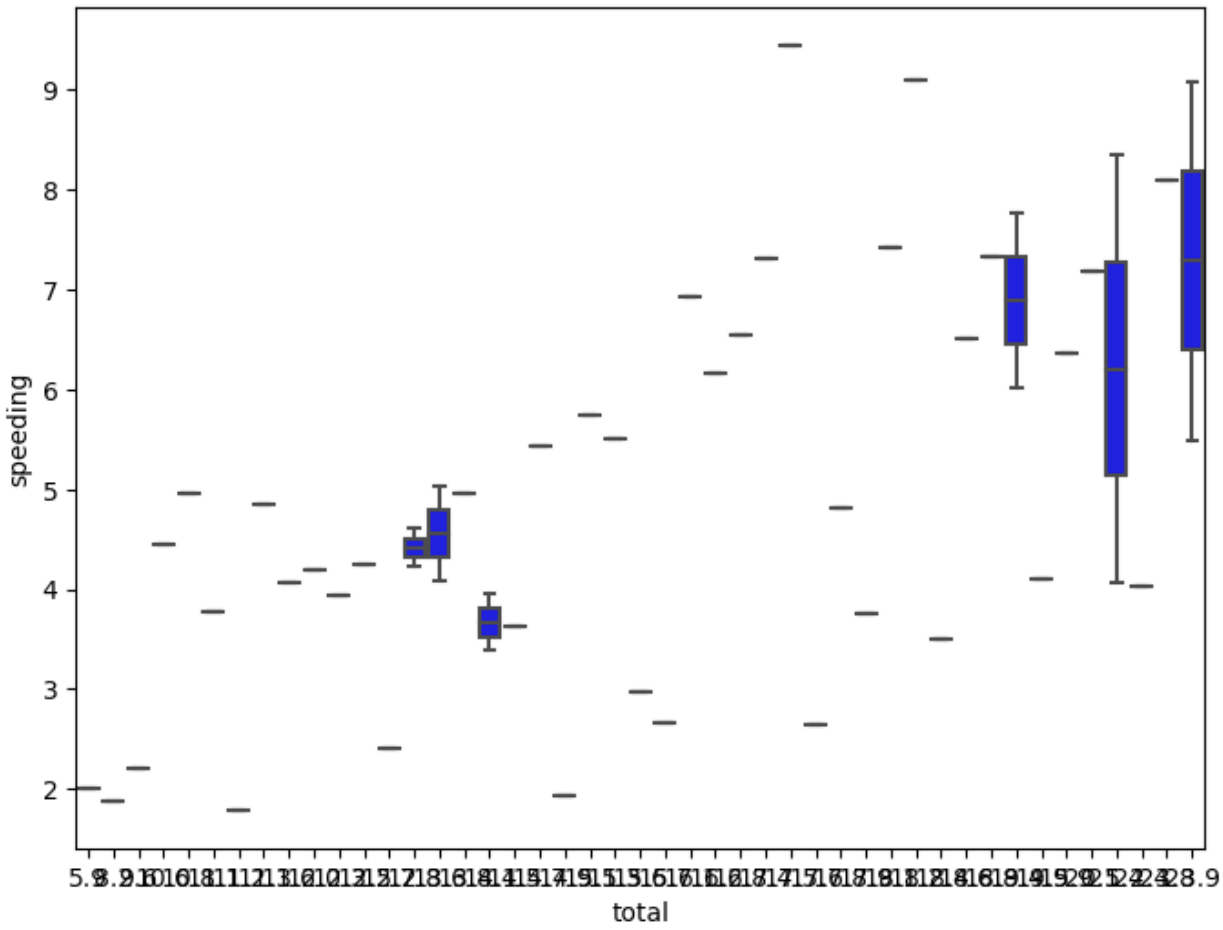

```
#The resulting bar plot will display bars for each unique value in
the'alcohol' column, with the height of each bar representing the
'total'value associated with that abbreviation.

sns.scatterplot(data=df, x='no_previous', y='not_distracted',
hue='abbrev')
plt.xlabel('no_previous')
```

```
Text(0.5, 0, 'no_previous')
```


abbrev
AL
AK
AZ
AR
CA
CO
CT
DE
DC
FL
GA
HI
ID
IL
IN
IA
KS
KY
LA
ME
MD
MA
MI
MN
MS
MO
MT
NE
NV
NH
NJ
NM
NY
NC
ND
OH
OK
OR
PA
RI
SC
not_distracted
20
15
10
5
8
10
12
14
16
18
20
22
no_previous

```
#The resulting scatter plot provides several insights into the
relationship between 'no_previous' and 'not_distracted,' with
consideration of the 'abbrev'

plt.figure(figsize=(8, 6))
sns.boxplot(data=df, x='total',y="speeding", color='blue')
```

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



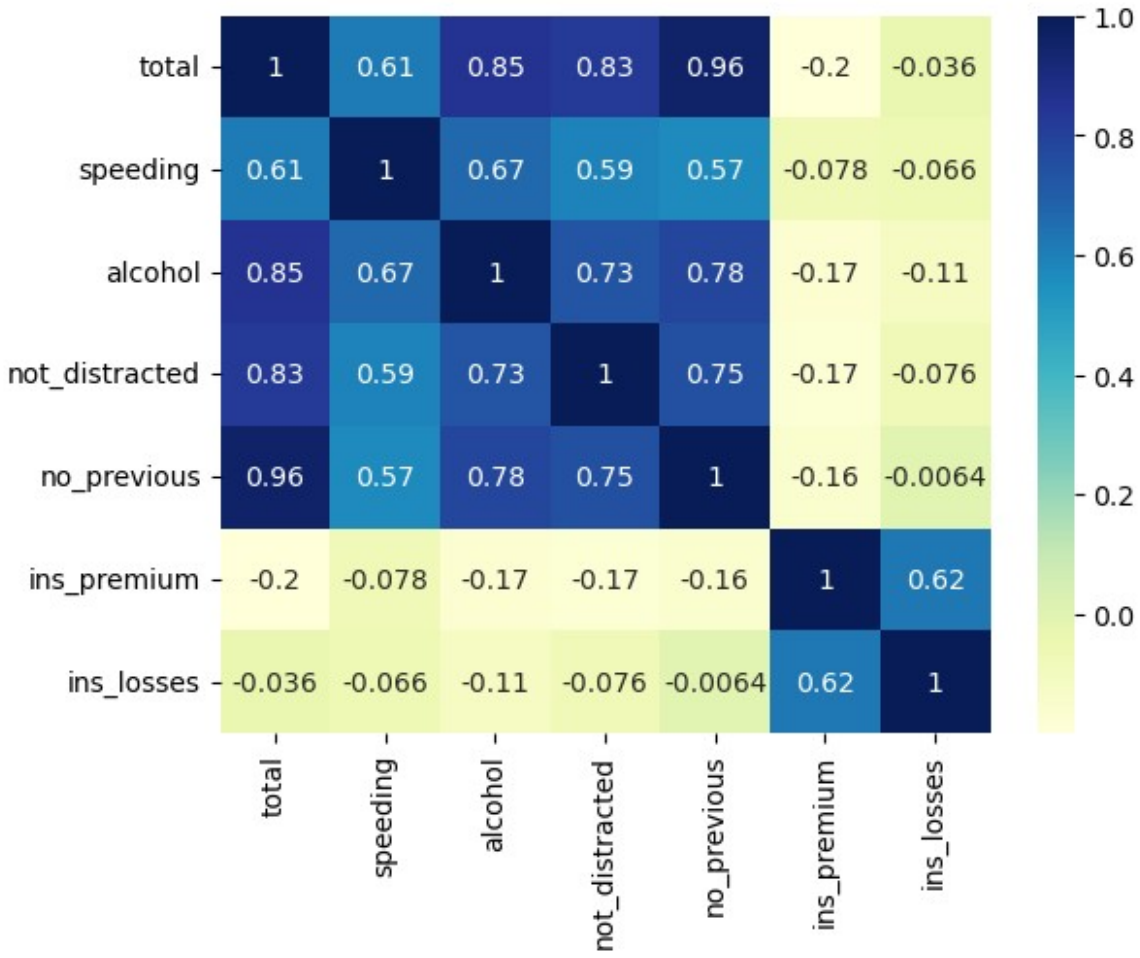

```
# To analyze the relationship between the total number of crashes
('total') and the number of speed-related crashes ('speeding').

corr=df.corr()
corr
```

```
C:\Users\tejos\AppData\Local\Temp\ipykernel_18468\4178516133.py: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.
  corr=df.corr()
```

```
                    total  speeding   alcohol  not_distracted
no_previous  \
total            1.000000  0.611548  0.852613        0.827560
0.956179
speeding         0.611548  1.000000  0.669719        0.588010
0.571976
alcohol          0.852613  0.669719  1.000000        0.732816
0.783520
not_distracted   0.827560  0.588010  0.732816        1.000000
0.747307
no_previous      0.956179  0.571976  0.783520        0.747307
1.000000
ins_premium     -0.199702 -0.077675 -0.170612       -0.174856    -
0.156895
ins_losses      -0.036011 -0.065928 -0.112547       -0.075970    -
0.006359

                 ins_premium  ins_losses
total              -0.199702   -0.036011
speeding           -0.077675   -0.065928
alcohol            -0.170612   -0.112547
not_distracted     -0.174856   -0.075970
no_previous        -0.156895   -0.006359
ins_premium         1.000000    0.623116
ins_losses          0.623116    1.000000
```

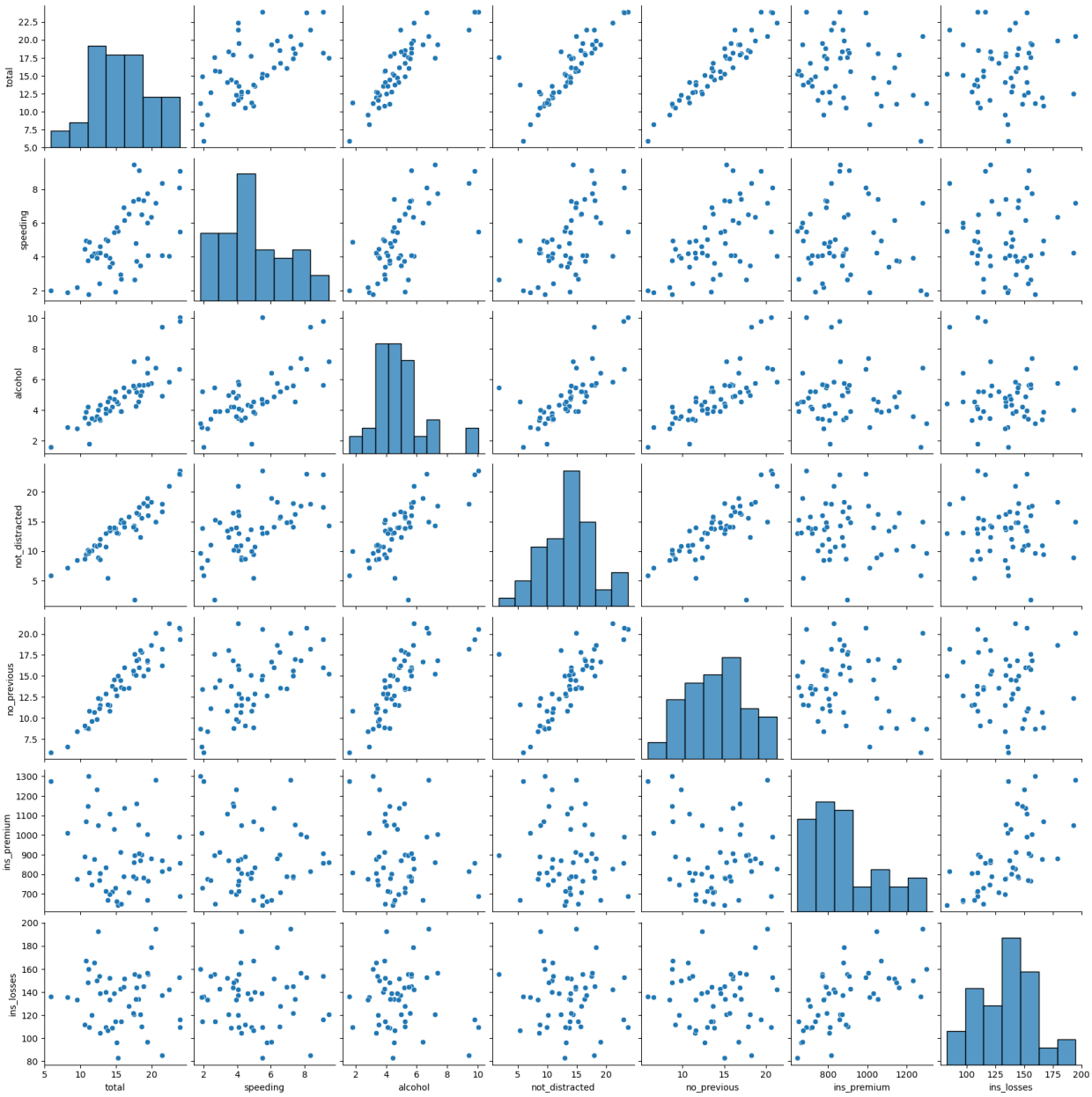
```
#we can see that "no_previous" is highly correlated to "total".we can
also see all the correlations

sns.heatmap(corr,annot=True,cmap="YlGnBu")
```

```
<Axes: >
```




```
#corellation between every attribute is given here
#>0.5 is highly correlated
#<0.5 is less correlated
#infernce:no_previous is highly collerated to total car crashes

sns.pairplot(df) #all the scatter plots and barplots
```

```
<seaborn.axisgrid.PairGrid at 0x204f4f3fdd0>
```


total
speeding
alcohol
not_distracted
no_previous
ins_premium
ins_losses