```python
#21bce8954
#Aditya Bajaj
import seaborn as sns
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt

print(sns.get_dataset_names())
```

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

```python
df=sns.load_dataset('car_crashes')

df
```

```
    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
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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.shape
```

```
(51, 8)
```

```
df.head()
```

```
   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
0      145.08
1      133.93
2      110.35
3      142.39
4      165.63
```

```
df.columns
```

```
Index(['total', 'speeding', 'alcohol', 'not_distracted',
'no_previous',
       'ins_premium', 'ins_losses'],
      dtype='object')
```

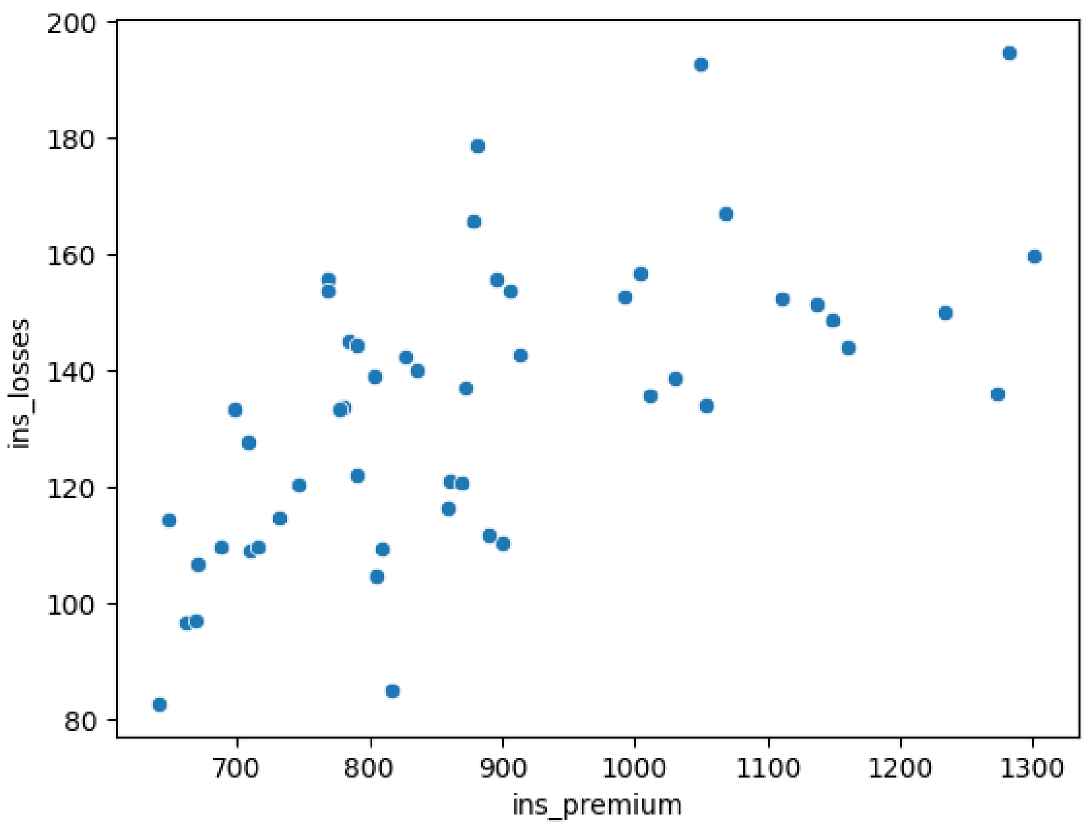
```
df.isnull().sum()
```

```
total             0
speeding          0
alcohol           0
not_distracted    0
no_previous       0
ins_premium       0
ins_losses        0
abbrev            0
dtype: int64
```

```
df=df.drop(columns='abbrev')
```

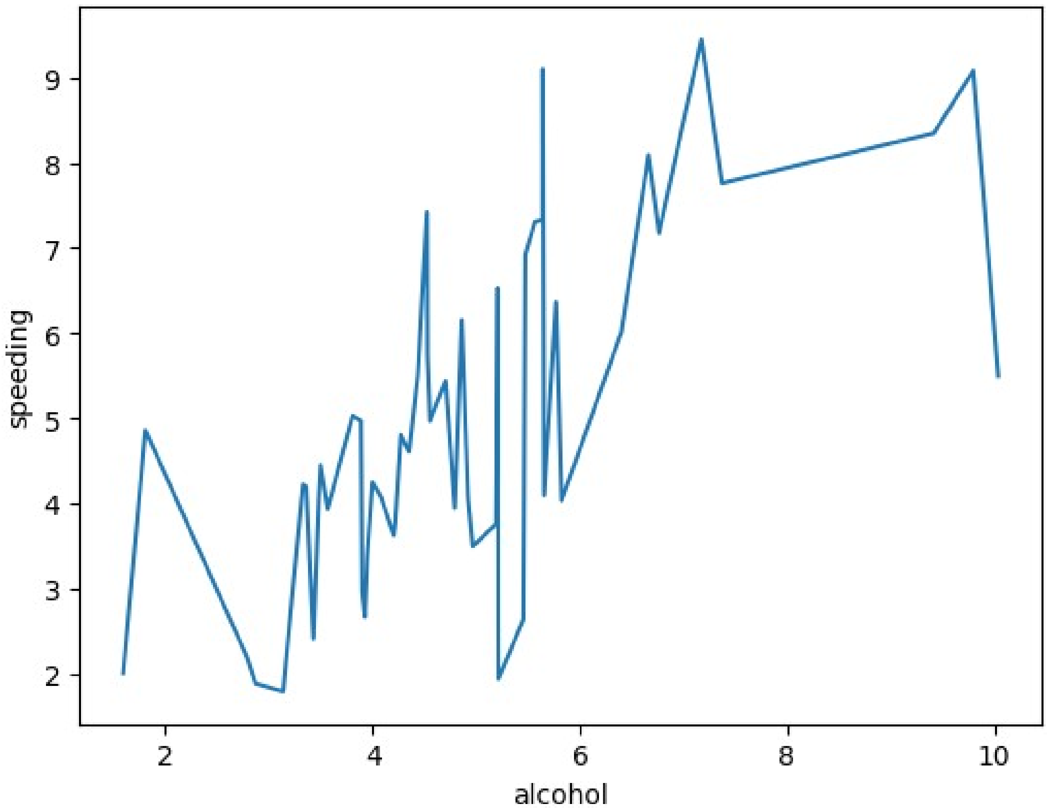
```
sns.scatterplot(x="ins_premium",y="ins_losses",data=df)
```

```
<AxesSubplot: xlabel='ins_premium', ylabel='ins_losses'>
```

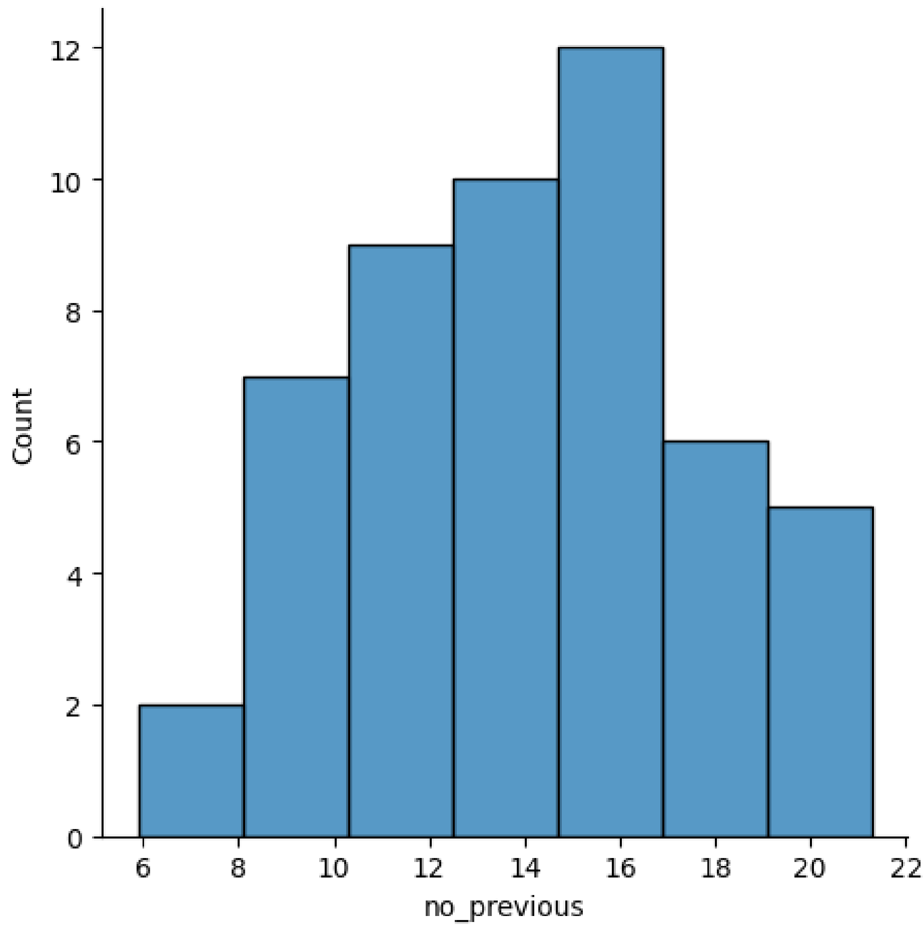



```
sns.lineplot(x="alcohol",y="speeding",data=df,ci=None)
```

```
C:\Users\adiforwhat\AppData\Local\Temp\ipykernel_3776\2741251668.py:1:
FutureWarning:

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

  sns.lineplot(x="alcohol",y="speeding",data=df,ci=None)

<AxesSubplot: xlabel='alcohol', ylabel='speeding'>
```

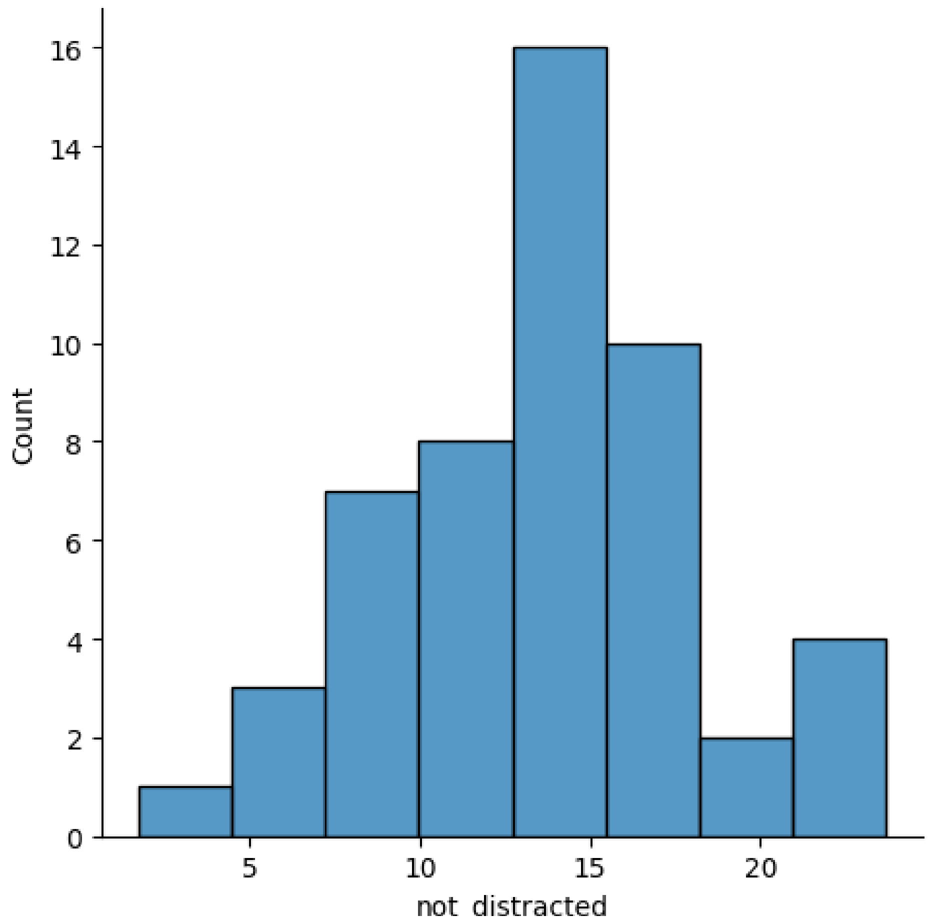



```
sns.displot(df['no_previous'])

<seaborn.axisgrid.FacetGrid at 0x1d9cf1c17b0>
```




```
sns.displot(df['not_distracted'])
```

```
<seaborn.axisgrid.FacetGrid at 0x1d9cf1c1390>
```

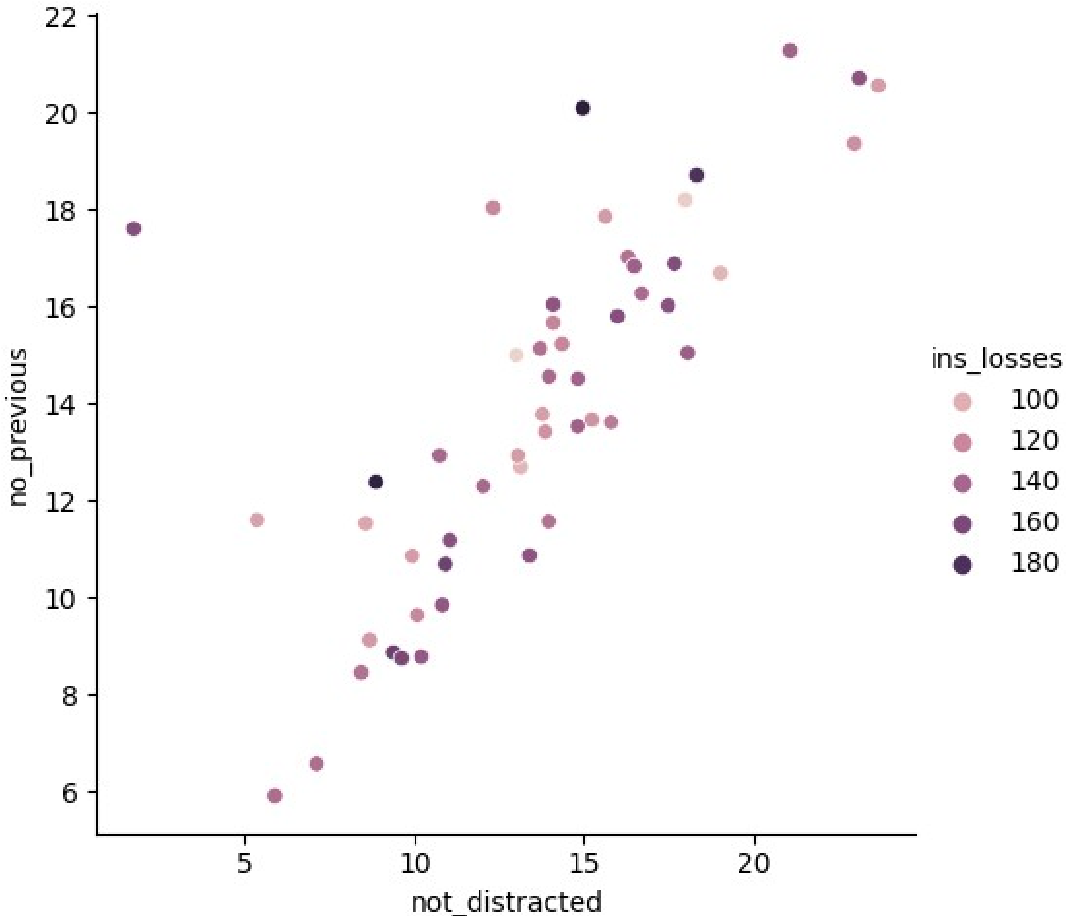



```
df.columns
```

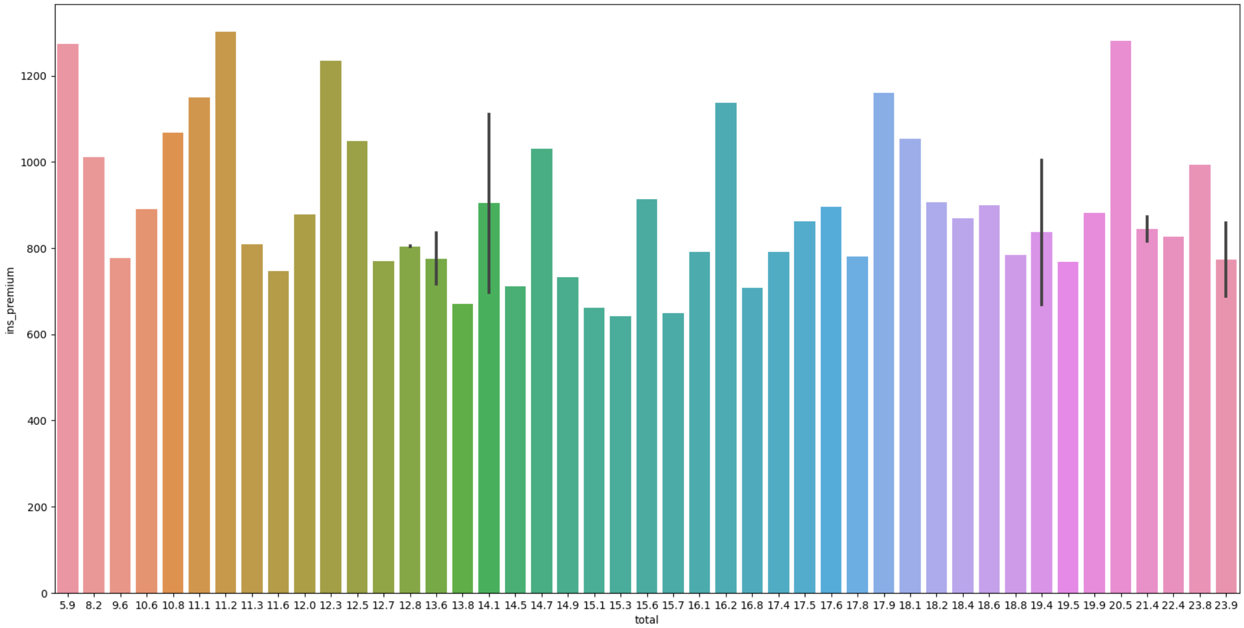
```
Index(['total', 'speeding', 'alcohol', 'not_distracted',
'no_previous',
       'ins_premium', 'ins_losses'],
      dtype='object')
```

```
sns.relplot(x="not_distracted",y="no_previous",data=df,hue="ins_losses
")
```

```
<seaborn.axisgrid.FacetGrid at 0x1d9cfdc6170>
```




```
plt.figure(figsize=(20,10))
sns.barplot(x="total",y="ins_premium",data=df)

<AxesSubplot: xlabel='total', ylabel='ins_premium'>
```




```
df

    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
0	145.08
1	133.93
2	110.35
3	142.39
4	165.63
5	139.91
6	167.02
7	151.48
8	136.05
9	144.18
10	142.80
11	120.92
12	82.75
13	139.15
14	108.92
15	114.47
16	133.80
17	137.13
18	194.78
19	96.57
20	192.70
21	135.63
22	152.26
23	133.35
24	155.77

```
25      144.45
26       85.15
27      114.82
28      138.71
29      120.21
30      159.85
31      120.75
32      150.01
33      127.82
34      109.72
35      133.52
36      178.86
37      104.61
38      153.86
39      148.58
40      116.29
41       96.87
42      155.57
43      156.83
44      109.48
45      109.61
46      153.72
47      111.62
48      152.56
49      106.62
50      122.04
```

```
corr=df.corr()
```

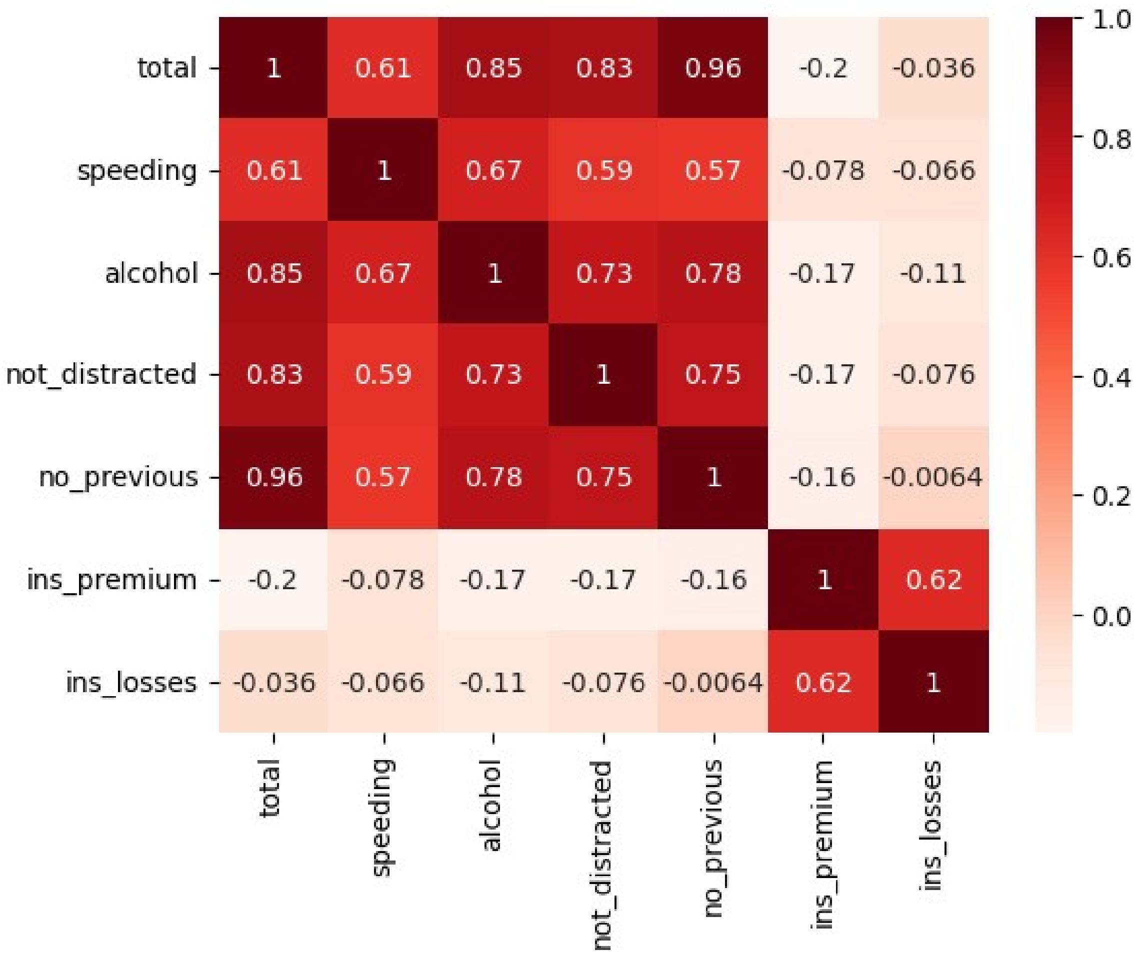
```
corr
```

```
                   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
```

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

```
<AxesSubplot: >
```

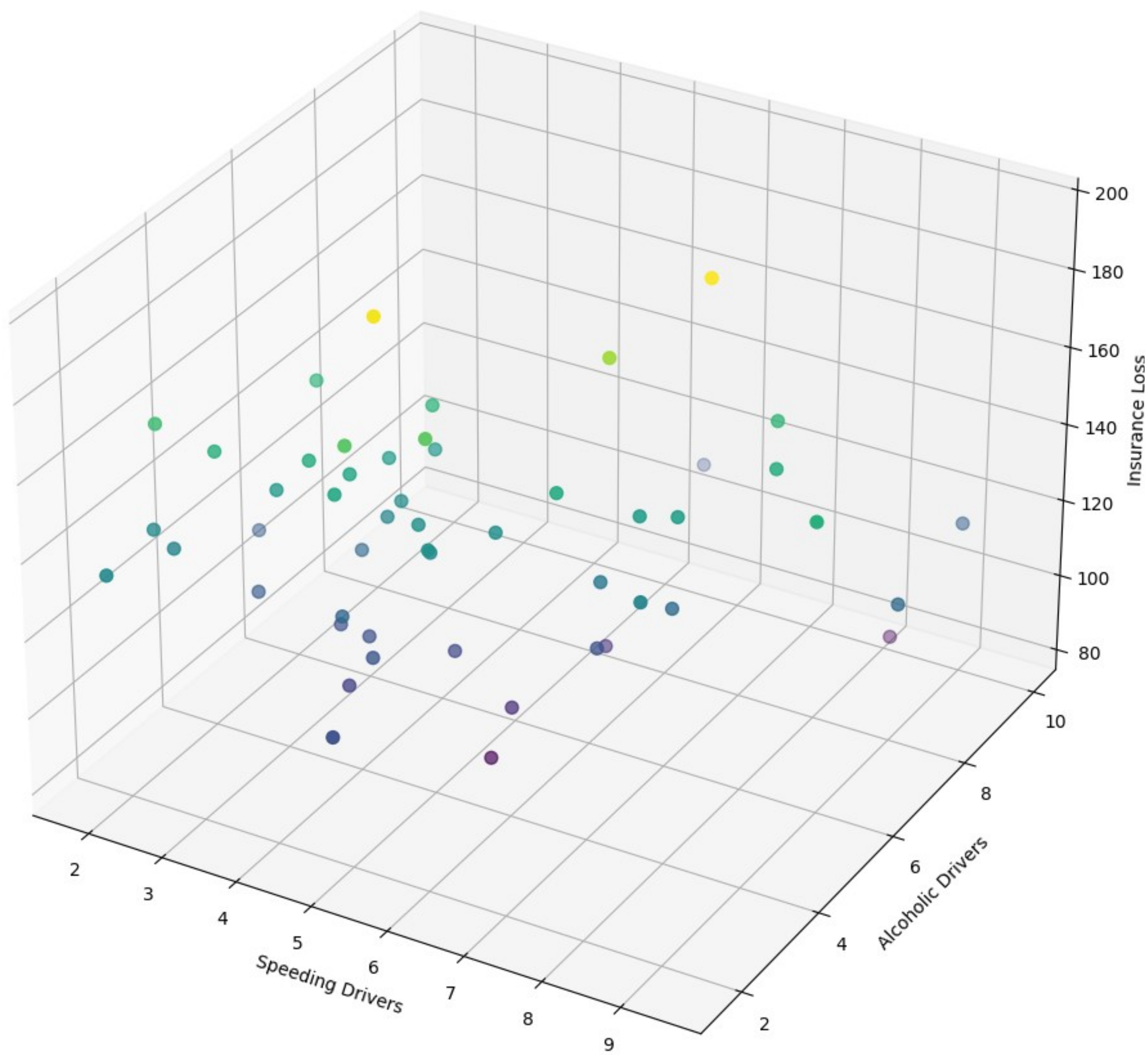



```
df.columns
```

```
Index(['total', 'speeding', 'alcohol', 'not_distracted',
'no_previous',
       'ins_premium', 'ins_losses'],
      dtype='object')
```

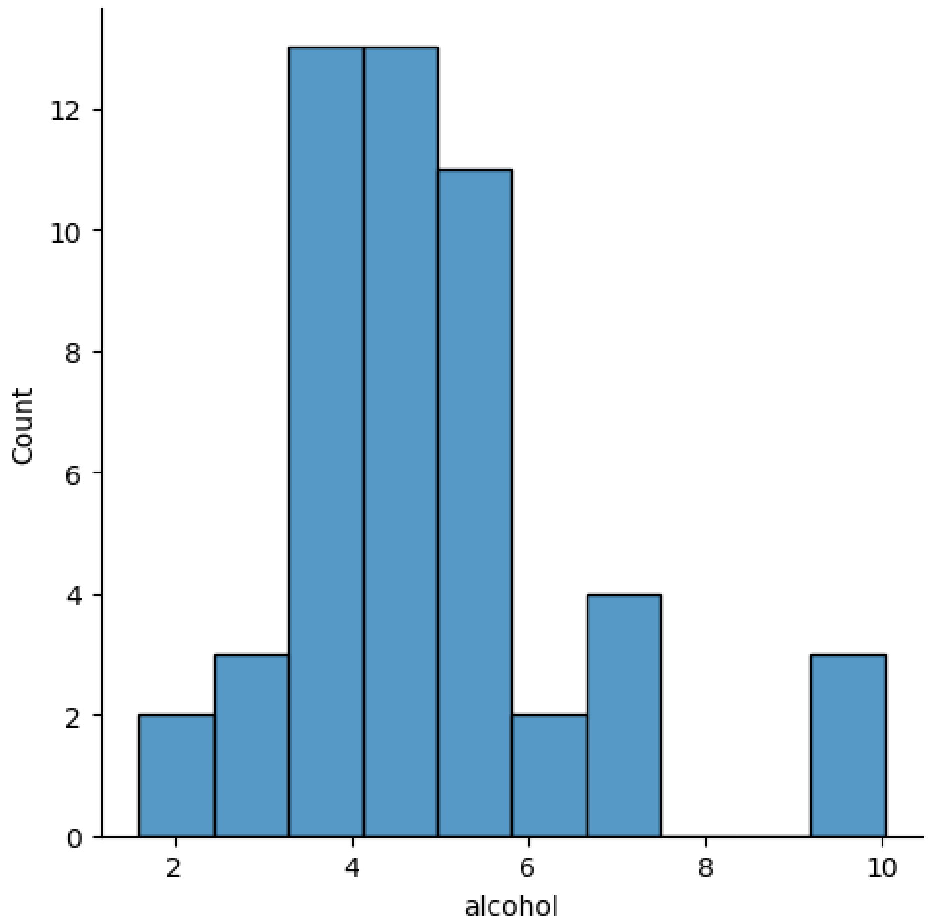
```
import matplotlib.pyplot as plt
from mpl_toolkits.mplot3d import Axes3D
```

```python
fig = plt.figure(figsize=(12, 12))
ax = fig.add_subplot(111, projection='3d')



# Extracting data
x = df['speeding']
y = df['alcohol']
z = df['ins_losses']

# Creating the scatter plot
ax.scatter(x, y, z, c=z, cmap='viridis', s=50)

# Adding labels
ax.set_xlabel('Speeding Drivers')
ax.set_ylabel('Alcoholic Drivers')
ax.set_zlabel('Insurance Loss')

plt.show()
```




```
sns.displot(df["alcohol"])
```

```
<seaborn.axisgrid.FacetGrid at 0x1d9d911bdf0>
```




```
df
```

```
   total  speeding  alcohol  not_distracted  no_previous  ins_premium  \
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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
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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
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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
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38	18.2	9.100	5.642	17.472	16.016	905.99
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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
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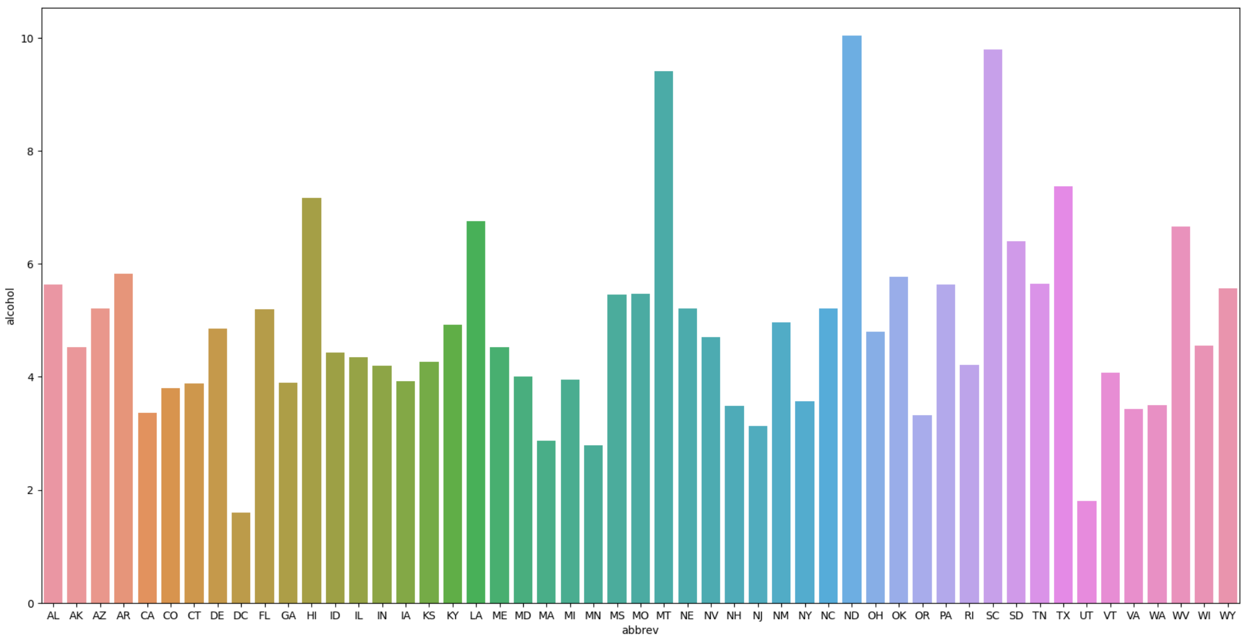
1	133.93	AK
2	110.35	AZ
3	142.39	AR
4	165.63	CA
5	139.91	CO
6	167.02	CT
7	151.48	DE
8	136.05	DC
9	144.18	FL
10	142.80	GA
11	120.92	HI
12	82.75	ID
13	139.15	IL
14	108.92	IN
15	114.47	IA
16	133.80	KS

```
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
```

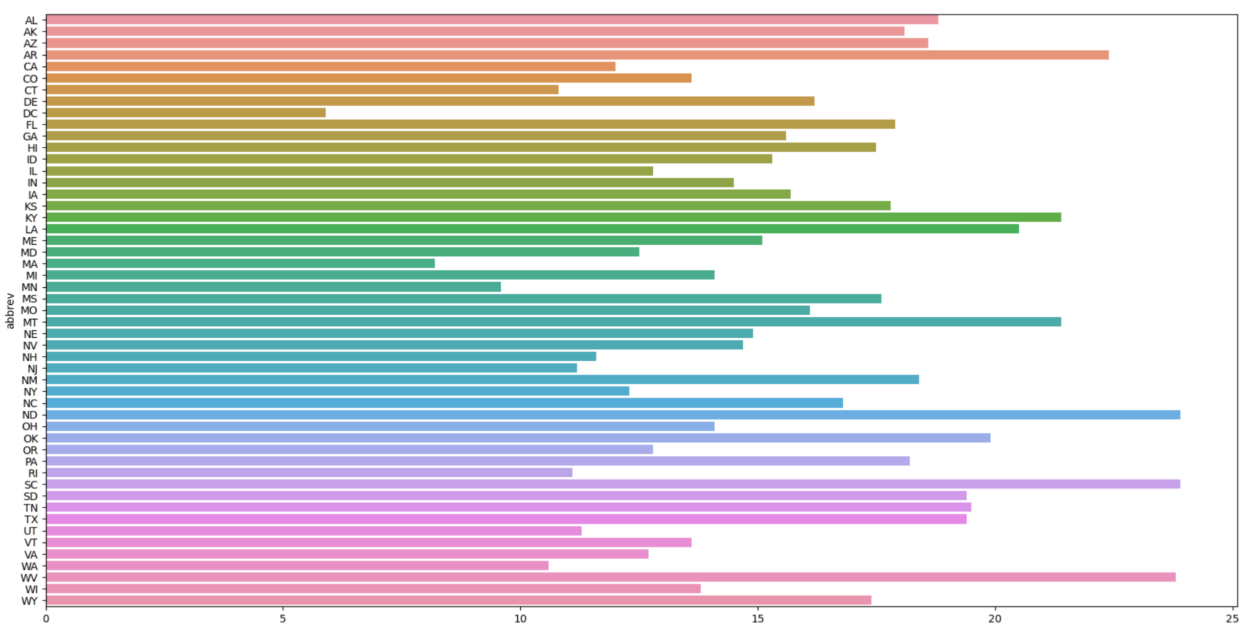
```
plt.figure(figsize=(20,10))
sns.barplot(data=df,x="abbrev",y="alcohol")
```

```
<AxesSubplot: xlabel='abbrev', ylabel='alcohol'>
```



Can see that ND state has the most car crashes caused due to alcoholism!

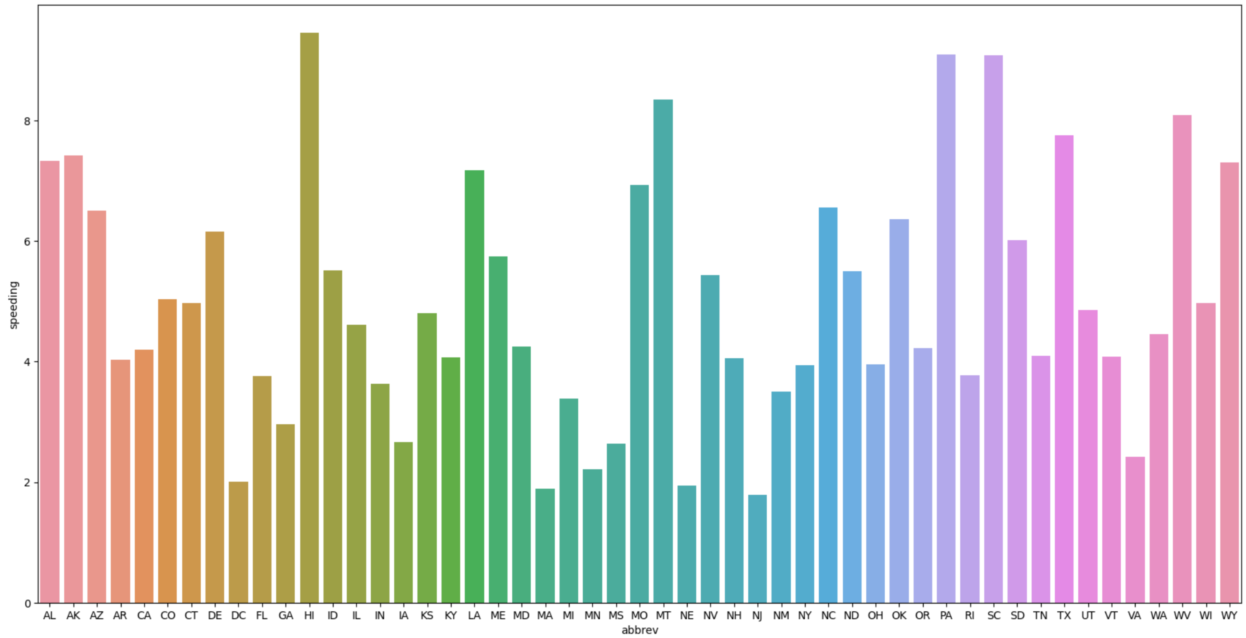
```
plt.figure(figsize=(20,10))
sns.barplot(data=df,x="total",y="abbrev")

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



can infer that ND state has the most car crashes as well!

```
plt.figure(figsize=(20,10))
sns.barplot(data=df,x="abbrev",y="speeding")
```

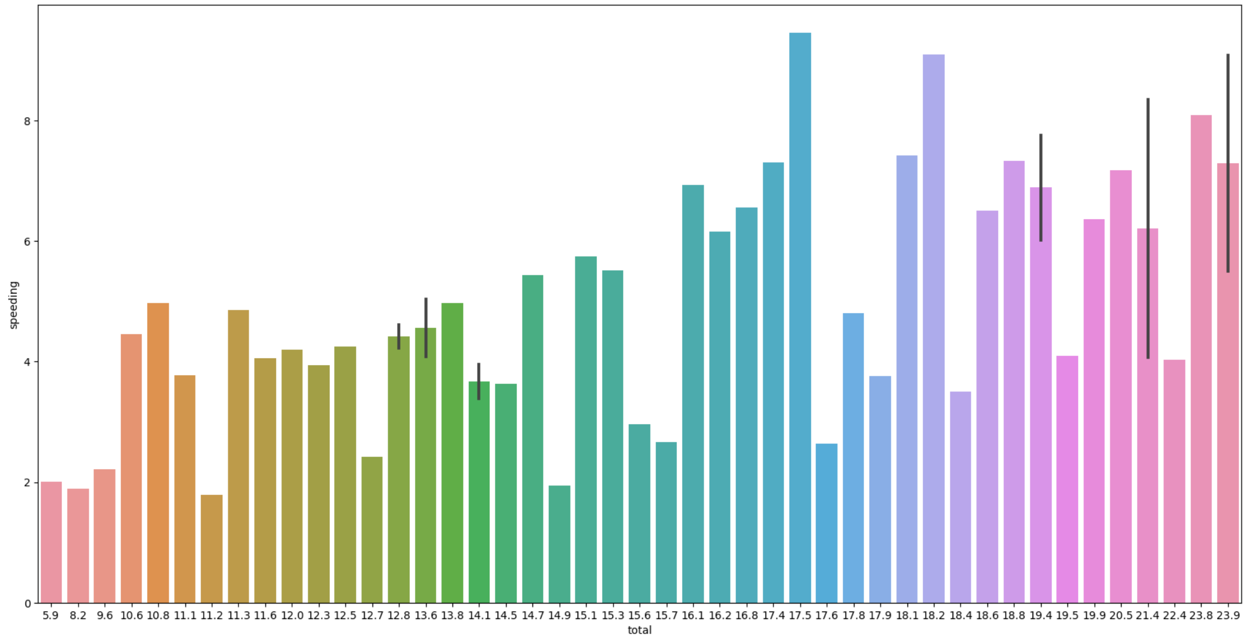
```
<AxesSubplot: xlabel='abbrev', ylabel='speeding'>
```



While hl state has the most car crashes caused due to speeding

```
plt.figure(figsize=(20,10))
sns.barplot(x="total",y="speeding",data=df)
```

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



we can notice from the plot that the car crashes will increase always when there is an increment in any of the four factors (alcohol, speeding, no distract, and no previous)

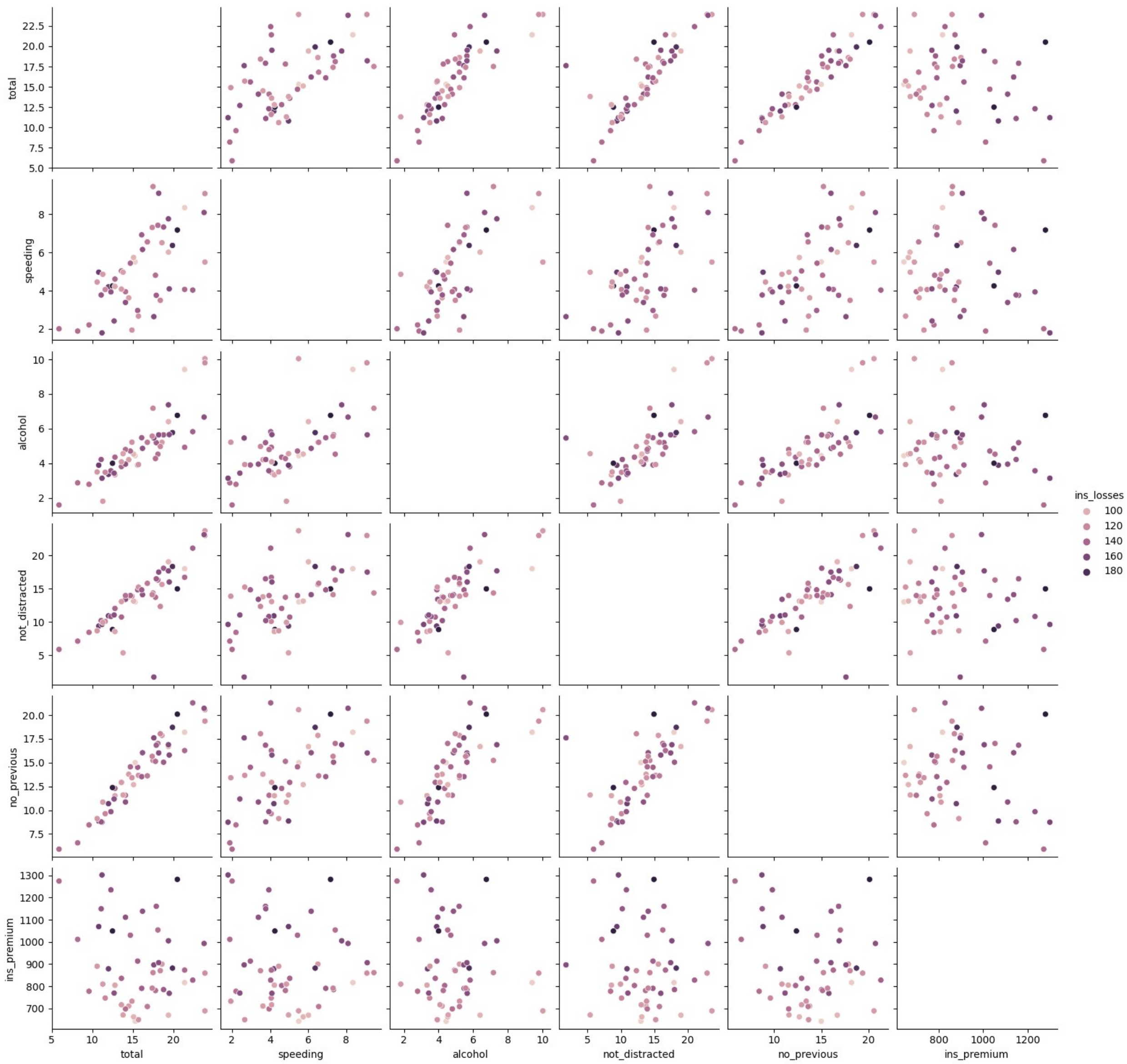
there is no relationship between the changing of alcoholic people and any other category, it seems like the more we have alcoholic, the more we have crashes despite any other factor

from the plot, it is safe to say that focused people (not distracted) have a normal number of crashes even if they were speeding! .. but whenever they drink, crashes happend

we have a strong lead that says doesn't affect crashes that mush, it is mostly on alcohol

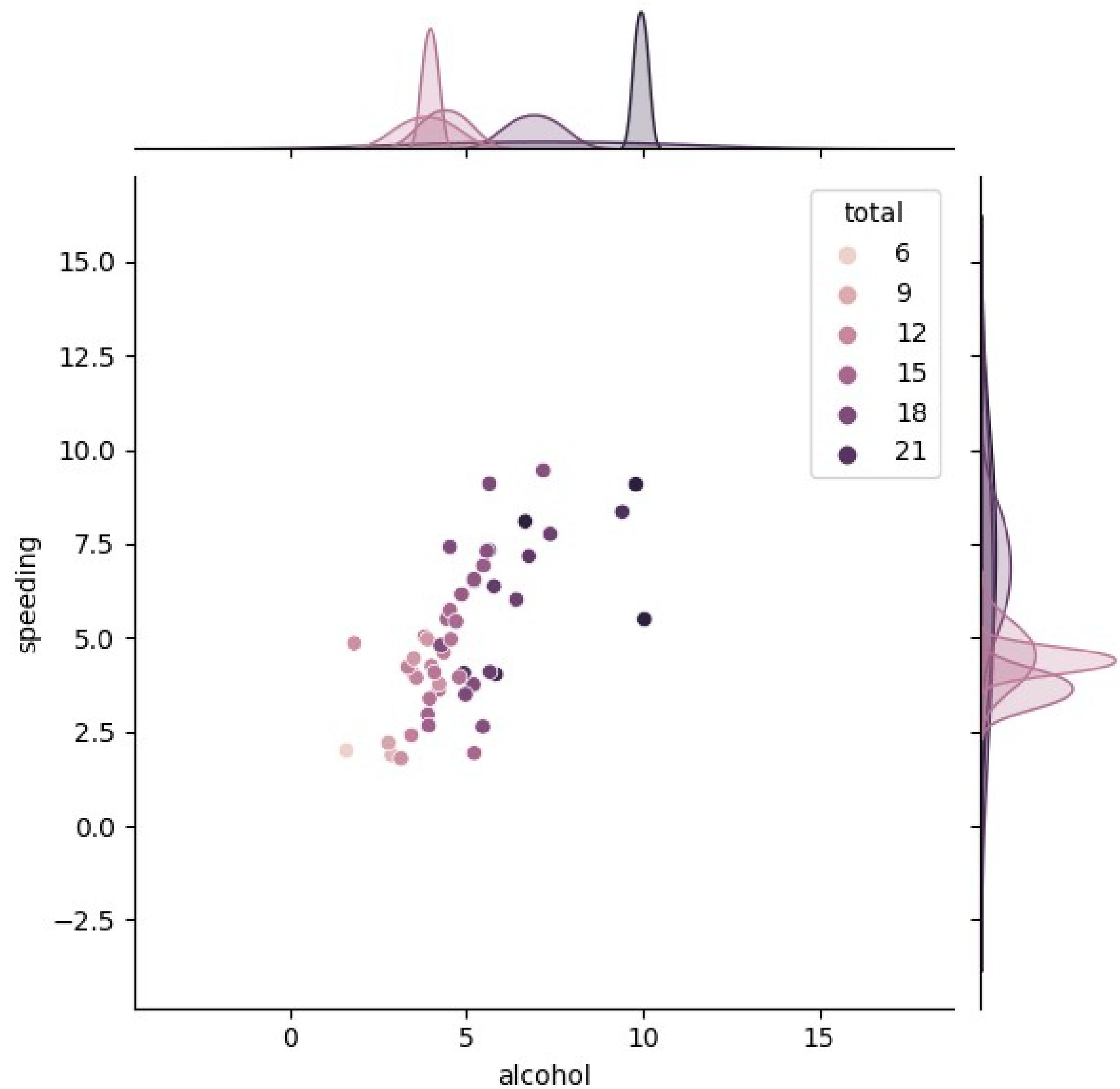
```
sns.pairplot(data=df,hue="ins_losses")
```

```
<seaborn.axisgrid.PairGrid at 0x1d9df20ba60>
```




```
sns.jointplot(data= df, y='speeding' , x='alcohol', hue='total')
```

```
<seaborn.axisgrid.JointGrid at 0x1d9e4743460>
```



proof that speeding and alcohol definitely raises the number of crashes!