Importing Necessary Libraries

In [1]:

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

In [4]:

```
sns.get_dataset_names()
```

Out[4]:

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

In [5]:

```
dataset=sns.load_dataset("car_crashes")
```

In [6]:

```
dataset
```

Out[6]:

	total	speeding	alcohol	not_distracted	no_previous	ins_premium	ins_losses	abbrev
0	18.8	7.332	5.640	18.048	15.040	784.55	145.08	AL
1	18.1	7.421	4.525	16.290	17.014	1053.48	133.93	AK
2	18.6	6.510	5.208	15.624	17.856	899.47	110.35	AZ
3	22.4	4.032	5.824	21.056	21.280	827.34	142.39	AR
4	12.0	4.200	3.360	10.920	10.680	878.41	165.63	CA
5	13.6	5.032	3.808	10.744	12.920	835.50	139.91	CO
6	10.8	4.968	3.888	9.396	8.856	1068.73	167.02	CT
7	16.2	6.156	4.860	14.094	16.038	1137.87	151.48	DE
8	5.9	2.006	1.593	5.900	5.900	1273.89	136.05	DC
9	17.9	3.759	5.191	16.468	16.826	1160.13	144.18	FL
10	15.6	2.964	3.900	14.820	14.508	913.15	142.80	GA
11	17.5	9.450	7.175	14.350	15.225	861.18	120.92	HI
12	15.3	5.508	4.437	13.005	14.994	641.96	82.75	ID
13	12.8	4.608	4.352	12.032	12.288	803.11	139.15	IL
14	14.5	3.625	4.205	13.775	13.775	710.46	108.92	IN
15	15.7	2.669	3.925	15.229	13.659	649.06	114.47	IA
16	17.8	4.806	4.272	13.706	15.130	780.45	133.80	KS
17	21.4	4.066	4.922	16.692	16.264	872.51	137.13	KY
18	20.5	7.175	6.765	14.965	20.090	1281.55	194.78	LA
19	15.1	5.738	4.530	13.137	12.684	661.88	96.57	ME
20	12.5	4.250	4.000	8.875	12.375	1048.78	192.70	MD
21	8.2	1.886	2.870	7.134	6.560	1011.14	135.63	MA
22	14.1	3.384	3.948	13.395	10.857	1110.61	152.26	MI
23	9.6	2.208	2.784	8.448	8.448	777.18	133.35	MN
24	17.6	2.640	5.456	1.760	17.600	896.07	155.77	MS
25	16.1	6.923	5.474	14.812	13.524	790.32	144.45	MO
26	21.4	8.346	9.416	17.976	18.190	816.21	85.15	MT
27	14.9	1.937	5.215	13.857	13.410	732.28	114.82	NE
28	14.7	5.439	4.704	13.965	14.553	1029.87	138.71	NV
29	11.6	4.060	3.480	10.092	9.628	746.54	120.21	NH
30	11.2	1.792	3.136	9.632	8.736	1301.52	159.85	NJ
31	18.4	3.496	4.968	12.328	18.032	869.85	120.75	NM
32	12.3	3.936	3.567	10.824	9.840	1234.31	150.01	NY
33	16.8	6.552	5.208	15.792	13.608	708.24	127.82	NC
34	23.9	5.497	10.038	23.661	20.554	688.75	109.72	ND
35	14.1	3.948	4.794	13.959	11.562	697.73	133.52	OH

	total	speeding	alcohol	not_distracted	no_previous	ins_premium	ins_losses	abbrev
36	19.9	6.368	5.771	18.308	18.706	881.51	178.86	OK
37	12.8	4.224	3.328	8.576	11.520	804.71	104.61	OR
38	18.2	9.100	5.642	17.472	16.016	905.99	153.86	PA
39	11.1	3.774	4.218	10.212	8.769	1148.99	148.58	RI
40	23.9	9.082	9.799	22.944	19.359	858.97	116.29	SC
41	19.4	6.014	6.402	19.012	16.684	669.31	96.87	SD
42	19.5	4.095	5.655	15.990	15.795	767.91	155.57	TN
43	19.4	7.760	7.372	17.654	16.878	1004.75	156.83	TX
44	11.3	4.859	1.808	9.944	10.848	809.38	109.48	UT
45	13.6	4.080	4.080	13.056	12.920	716.20	109.61	VT
46	12.7	2.413	3.429	11.049	11.176	768.95	153.72	VA
47	10.6	4.452	3.498	8.692	9.116	890.03	111.62	WA
48	23.8	8.092	6.664	23.086	20.706	992.61	152.56	WV
49	13.8	4.968	4.554	5.382	11.592	670.31	106.62	WI
50	17.4	7.308	5.568	14.094	15.660	791.14	122.04	WY

In [7]:

```
dataset.shape
```

Out[7]:

```
(51, 8)
```

In [8]:

```
dataset.head()
```

Out[8]:

	total	speeding	alcohol	not_distracted	no_previous	ins_premium	ins_losses	abbrev
0	18.8	7.332	5.640	18.048	15.040	784.55	145.08	AL
1	18.1	7.421	4.525	16.290	17.014	1053.48	133.93	AK
2	18.6	6.510	5.208	15.624	17.856	899.47	110.35	AZ
3	22.4	4.032	5.824	21.056	21.280	827.34	142.39	AR
4	12.0	4.200	3.360	10.920	10.680	878.41	165.63	CA

In [9]:

```
dataset.tail()
```

Out[9]:

	total	speeding	alcohol	not_distracted	no_previous	ins_premium	ins_losses	abbrev
46	12.7	2.413	3.429	11.049	11.176	768.95	153.72	VA
47	10.6	4.452	3.498	8.692	9.116	890.03	111.62	WA
48	23.8	8.092	6.664	23.086	20.706	992.61	152.56	WV
49	13.8	4.968	4.554	5.382	11.592	670.31	106.62	WI
50	17.4	7.308	5.568	14.094	15.660	791.14	122.04	WY

In [10]:

```
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
```

In [11]:

```
dataset.info
```

Out[11]:

```
<bound method DataFrame.info of     total  speeding  alcohol  not_distra
cted  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  >
```

In [14]:

```
dataset.describe()
```

Out[14]:

```
           total   speeding    alcohol  not_distracted  no_previous  ins_premium  ins_loss
count  51.000000  51.000000  51.000000       51.000000    51.000000    51.000000   51.0000
mean   15.790196   4.998196   4.886784       13.573176    14.004882   886.957647  134.493
std     4.122002   2.017747   1.729133        4.508977     3.764672   178.296285   24.835
min     5.900000   1.792000   1.593000        1.760000     5.900000   641.960000   82.750
25%    12.750000   3.766500   3.894000       10.478000    11.348000   768.430000  114.645
50%    15.600000   4.608000   4.554000       13.857000    13.775000   858.970000  136.050
75%    18.500000   6.439000   5.604000       16.140000    16.755000  1007.945000  151.870
max    23.900000   9.450000  10.038000       23.661000    21.280000  1301.520000  194.780
```

car_crashes

Accidents in the states of the USA are examined. This is the data set of the cause of the accidents and the cost to the accident insurance companies.

· total -> Number of drivers involved in fatal collisions per billion miles (5.900–23.900)

· speeding -> Percentage Of Drivers Involved In Fatal Collisions Who Were Speeding (1.792–9.450)

· alcohol -> Percentage Of Drivers Involved In Fatal Collisions Who Were Alcohol-Impaired (1.593–10.038)

· not_distracted -> Percentage Of Drivers Involved In Fatal Collisions Who Were Not Distracted (1.760–23.661)

· no_previous -> Percentage Of Drivers Involved In Fatal Collisions Who Had Not Been Involved In Any Previous Accidents (5.900–21.280)

· ins_premium -> Car Insurance Premiums (641.960–1301.520)

· ins_losses -> Losses incurred by insurance companies for collisions per insured driver (82.75–194.780)

· abbrev -> USA states

In [15]:

```
dataset.isnull()
```

Out[15]:

	total	speeding	alcohol	not_distracted	no_previous	ins_premium	ins_losses	abbrev
0	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False
5	False	False	False	False	False	False	False	False
6	False	False	False	False	False	False	False	False
7	False	False	False	False	False	False	False	False
8	False	False	False	False	False	False	False	False
9	False	False	False	False	False	False	False	False
10	False	False	False	False	False	False	False	False
11	False	False	False	False	False	False	False	False
12	False	False	False	False	False	False	False	False
13	False	False	False	False	False	False	False	False
14	False	False	False	False	False	False	False	False
15	False	False	False	False	False	False	False	False
16	False	False	False	False	False	False	False	False
17	False	False	False	False	False	False	False	False
18	False	False	False	False	False	False	False	False
19	False	False	False	False	False	False	False	False
20	False	False	False	False	False	False	False	False
21	False	False	False	False	False	False	False	False
22	False	False	False	False	False	False	False	False
23	False	False	False	False	False	False	False	False
24	False	False	False	False	False	False	False	False
25	False	False	False	False	False	False	False	False
26	False	False	False	False	False	False	False	False
27	False	False	False	False	False	False	False	False
28	False	False	False	False	False	False	False	False
29	False	False	False	False	False	False	False	False
30	False	False	False	False	False	False	False	False
31	False	False	False	False	False	False	False	False
32	False	False	False	False	False	False	False	False
33	False	False	False	False	False	False	False	False
34	False	False	False	False	False	False	False	False
35	False	False	False	False	False	False	False	False

	total	speeding	alcohol	not_distracted	no_previous	ins_premium	ins_losses	abbrev
36	False	False	False	False	False	False	False	False
37	False	False	False	False	False	False	False	False
38	False	False	False	False	False	False	False	False
39	False	False	False	False	False	False	False	False
40	False	False	False	False	False	False	False	False
41	False	False	False	False	False	False	False	False
42	False	False	False	False	False	False	False	False
43	False	False	False	False	False	False	False	False
44	False	False	False	False	False	False	False	False
45	False	False	False	False	False	False	False	False
46	False	False	False	False	False	False	False	False
47	False	False	False	False	False	False	False	False
48	False	False	False	False	False	False	False	False
49	False	False	False	False	False	False	False	False
50	False	False	False	False	False	False	False	False

In [16]:

```
dataset.isnull().any()
```

Out[16]:

```
total             False
speeding          False
alcohol           False
not_distracted    False
no_previous       False
ins_premium       False
ins_losses        False
abbrev            False
dtype: bool
```

In [17]:

```
dataset.isnull().sum()
```

Out[17]:

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

Correlation

In [20]:

```
corr=dataset.corr()
corr
```

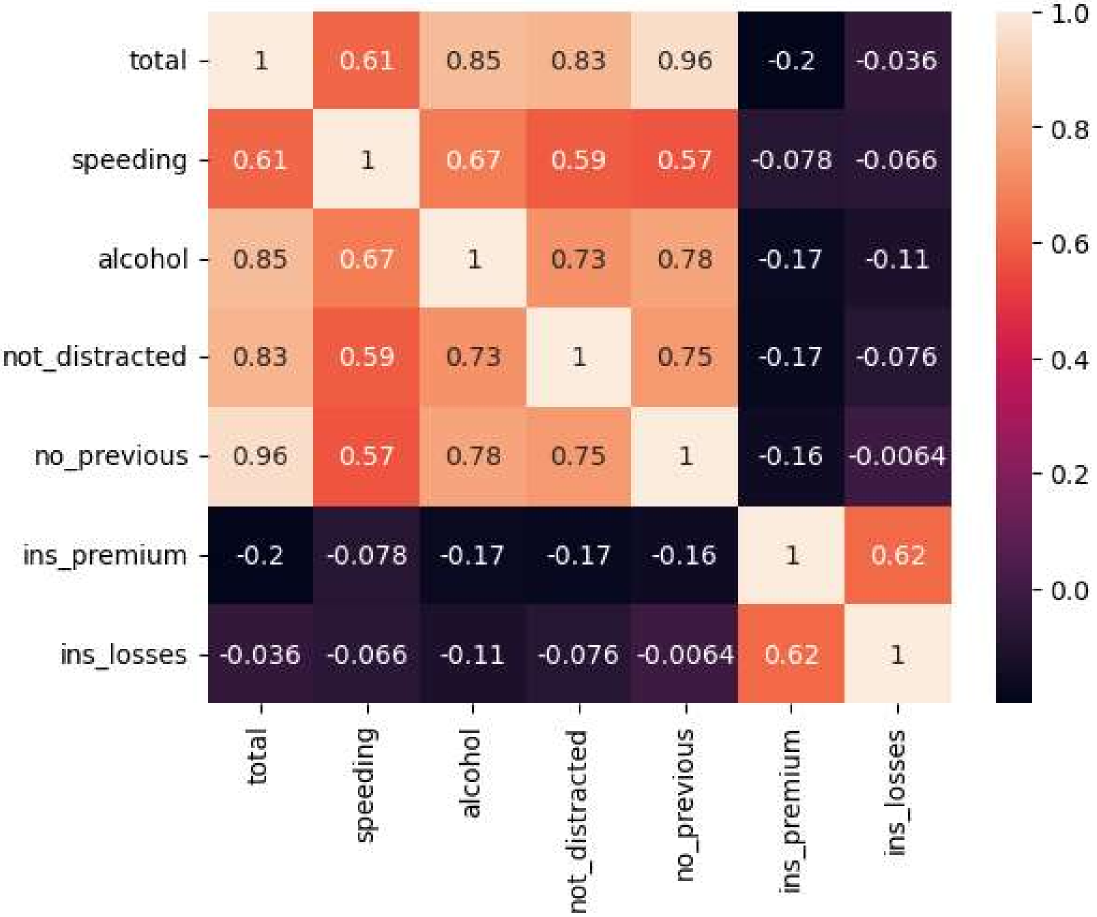
```
C:\Users\dines\AppData\Local\Temp\ipykernel_13496\1091080309.py:1: Futur
eWarning: The default value of numeric_only in DataFrame.corr is depreca
ted. In a future version, it will default to False. Select only valid co
lumns or specify the value of numeric_only to silence this warning.
  corr=dataset.corr()
```

Out[20]:

	total	speeding	alcohol	not_distracted	no_previous	ins_premium	i
total	1.000000	0.611548	0.852613	0.827560	0.956179	-0.199702	
speeding	0.611548	1.000000	0.669719	0.588010	0.571976	-0.077675	
alcohol	0.852613	0.669719	1.000000	0.732816	0.783520	-0.170612	
not_distracted	0.827560	0.588010	0.732816	1.000000	0.747307	-0.174856	
no_previous	0.956179	0.571976	0.783520	0.747307	1.000000	-0.156895	
ins_premium	-0.199702	-0.077675	-0.170612	-0.174856	-0.156895	1.000000	
ins_losses	-0.036011	-0.065928	-0.112547	-0.075970	-0.006359	0.623116	

In [21]:
```
sns.heatmap(corr,annot=True)
```

Out[21]:
```
<Axes: >
```



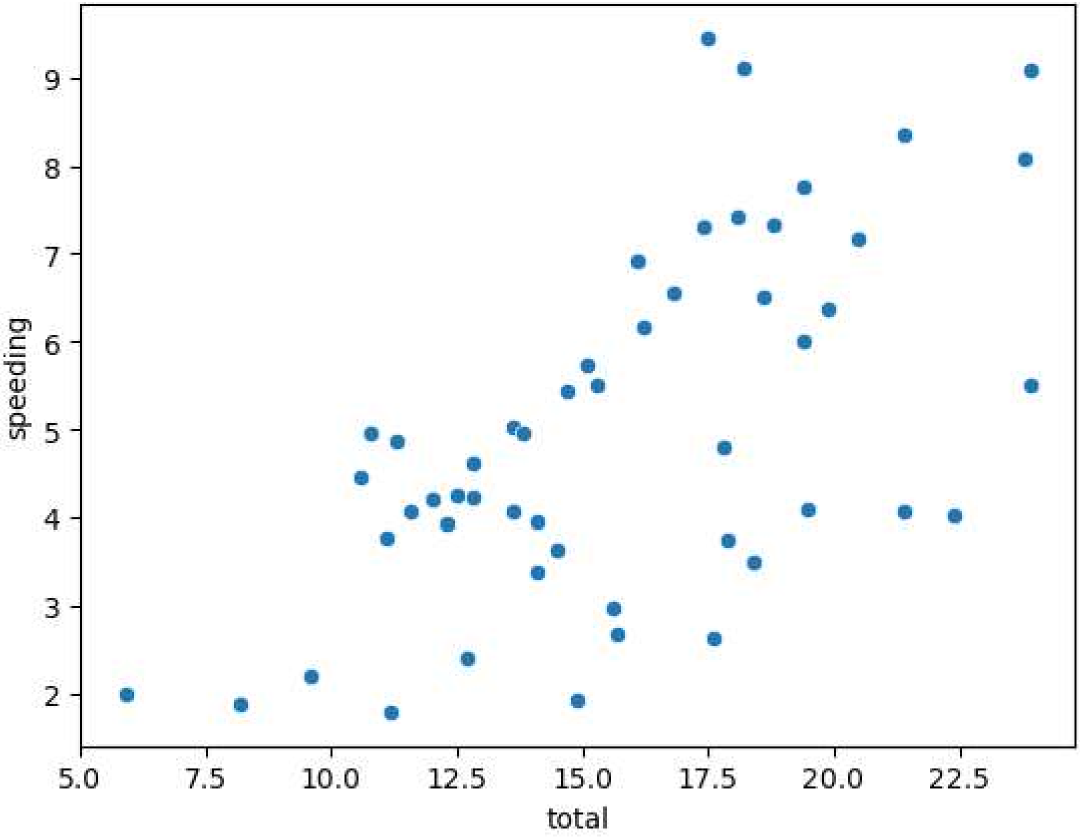
Scatter plot

In [24]:

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

Out[24]:

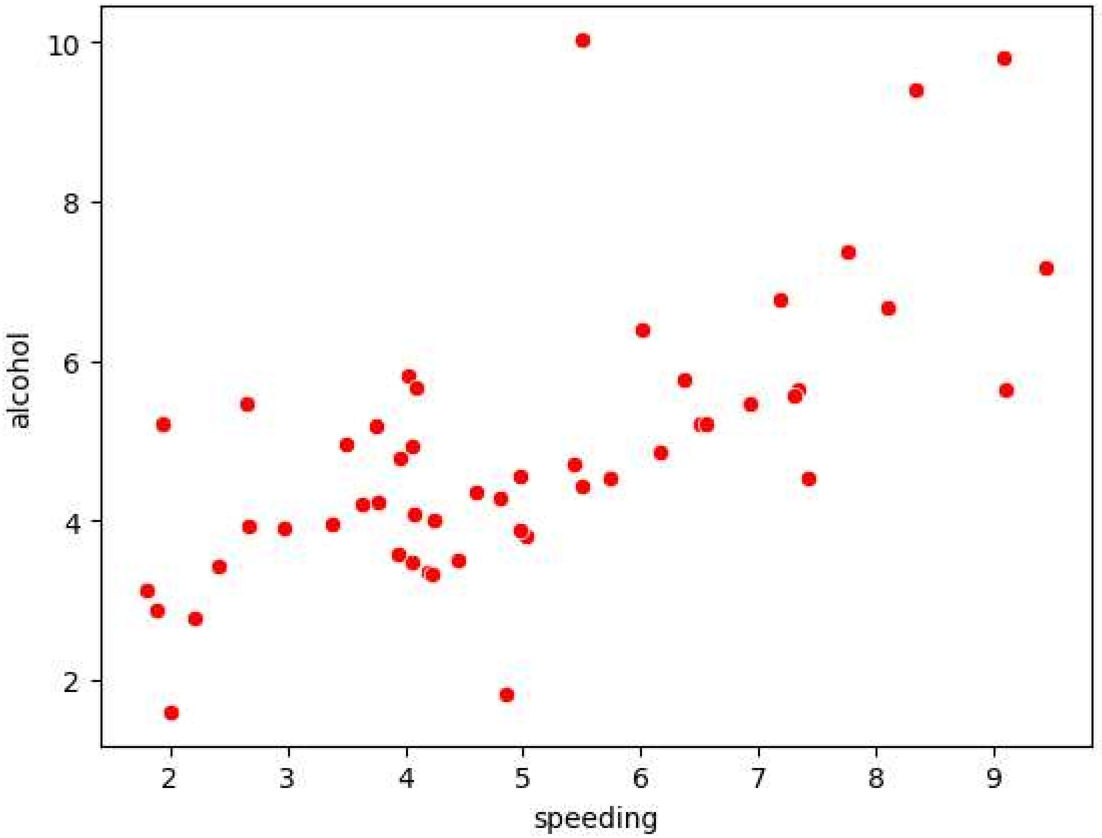
```
<Axes: xlabel='total', ylabel='speeding'>
```



Inference: From above graph we can conclude that no of drivers involved in fatal collosion is directly proportional to speeding.

In [29]:
```
sns.scatterplot(x="speeding",y="alcohol",data=dataset,color="red")
```

Out[29]:
```
<Axes: xlabel='speeding', ylabel='alcohol'>
```



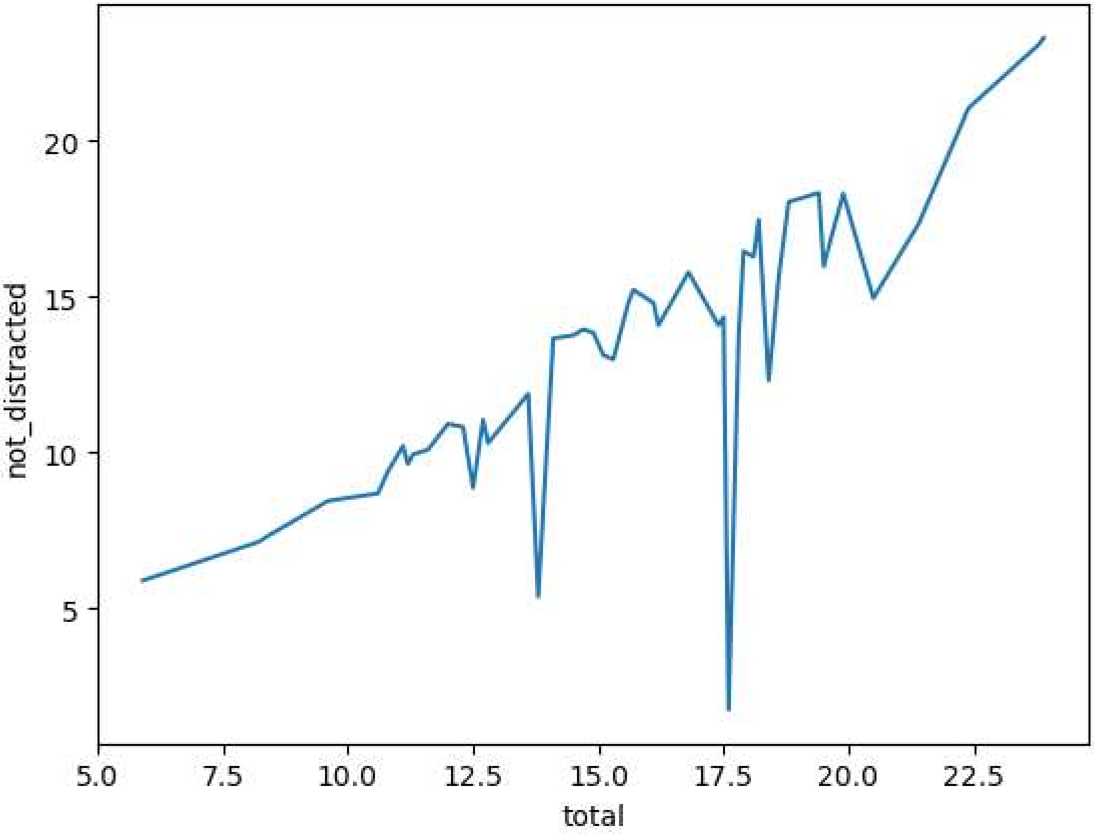
Inference: From above graph we can conclude that Percentage Of Drivers Involved In Fatal Collisions Who Were Speeding

is directly proportional to Percentage Of Drivers Involved In Fatal Collisions Who Were Alcohol-Impaired.

Line Plot

```
In [37]:  sns.lineplot(x="total",y="not_distracted",data=dataset,errorbar=None)
```

```
Out[37]: <Axes: xlabel='total', ylabel='not_distracted'>
```



Inference: From above graph Number of drivers involved in fatal collisions is

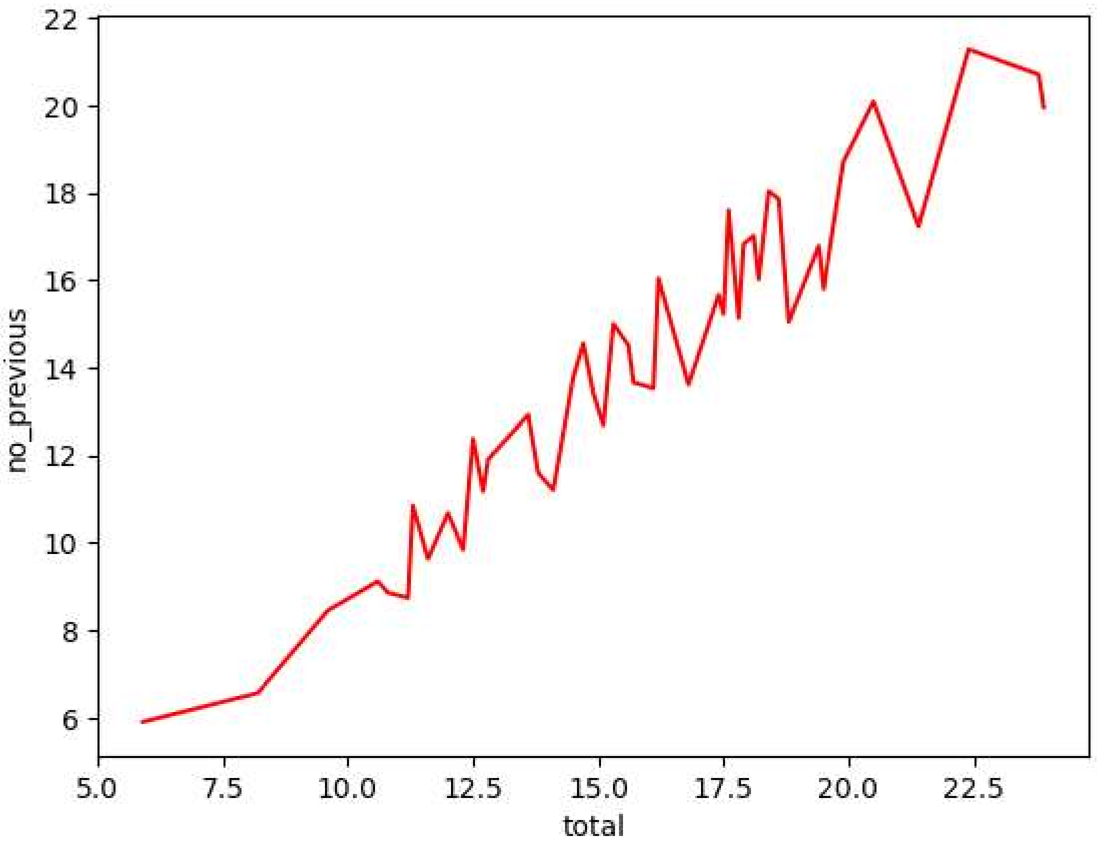
linearly proportional to Percentage Of Drivers Involved In Fatal Collisions Who Were Not Distracted.

In [42]:

```
sns.lineplot(x="total",y="no_previous",data=dataset,errorbar=None,color="r
```

Out[42]:

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



Inference: From above graph Number of drivers involved in fatal collisions is linearly proportional to Percentage Of

Drivers Involved In Fatal Collisions Who Had Not Been Involved In Any Previous Accidents

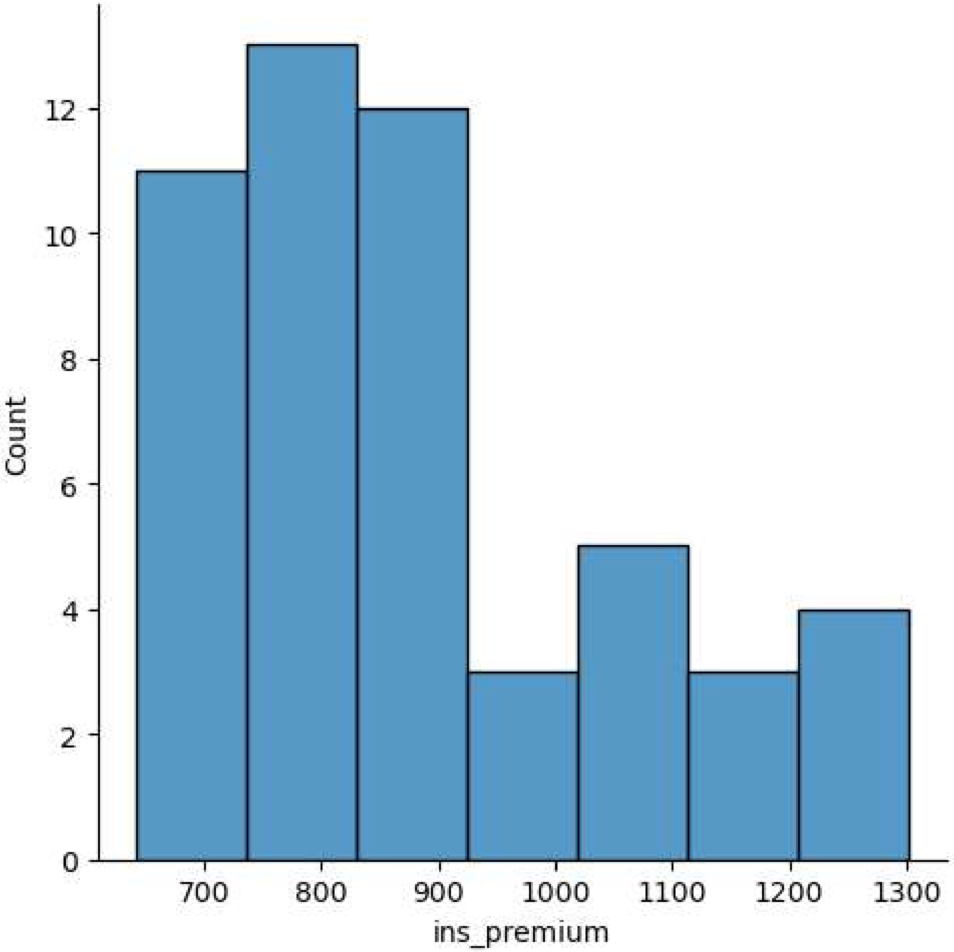
Distribution Plot

In [46]:

```
sns.displot(dataset["ins_premium"])
```

Out[46]:

```
<seaborn.axisgrid.FacetGrid at 0x14224aa1150>
```



Inference: From above graph ins_premium maximum present at 800

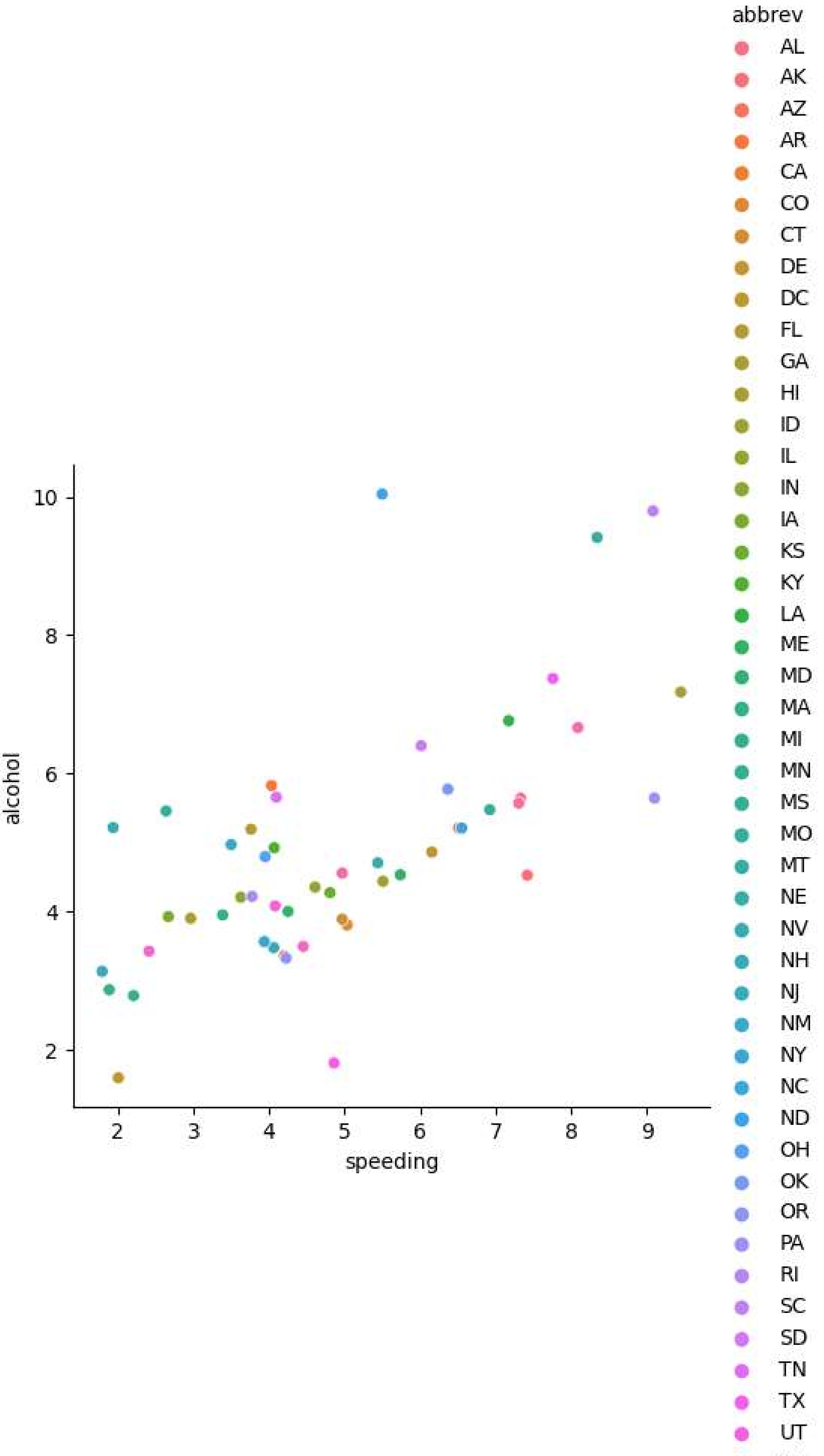
Relation Plot

In [49]:

```
sns.relplot(x="speeding",y="alcohol",data=dataset,hue="abbrev")
```

Out[49]:

```
<seaborn.axisgrid.FacetGrid at 0x1422645ee50>
```

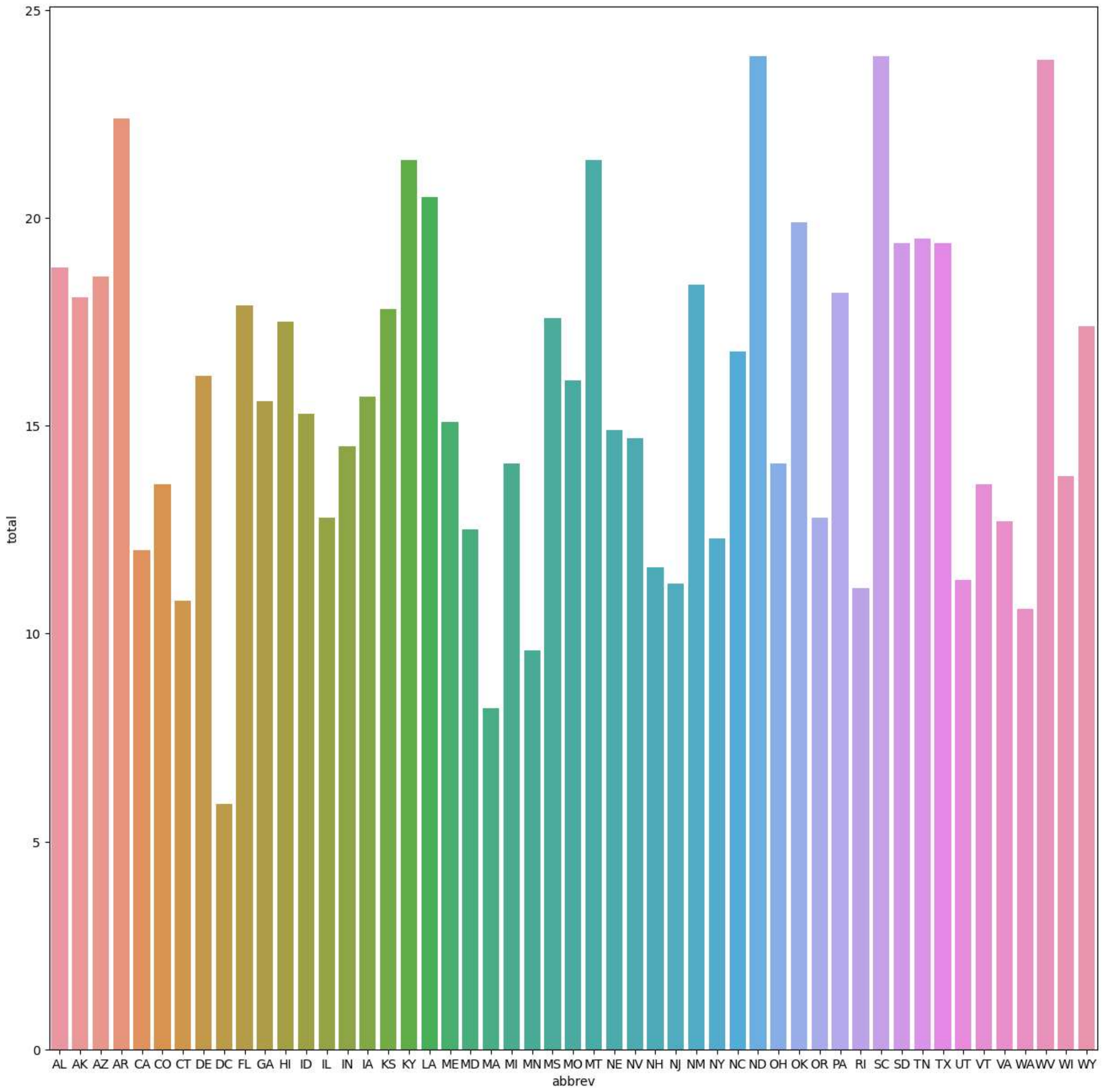

abbrev
AL
AK
AZ
AR
CA
CO
CT
DE
DC
FL
GA
HI
ID
IL
IN
IA
KS
KY
LA
ME
MD
MA
MI
MN
MS
MO
MT
NE
NV
NH
NJ
NM
NY
NC
ND
OH
OK
OR
PA
RI
SC
SD
TN
TX
UT
alcohol
10
8
6
4
2
speeding
2
3
4
5
6
7
8
9

Inference: speeding is linearly proportional to alcohol

Bar Plot

```
In [59]:  plt.figure(figsize=(15,15))
          sns.barplot(x="abbrev",y="total",data=dataset)
```

```
Out[59]: <Axes: xlabel='abbrev', ylabel='total'>
```

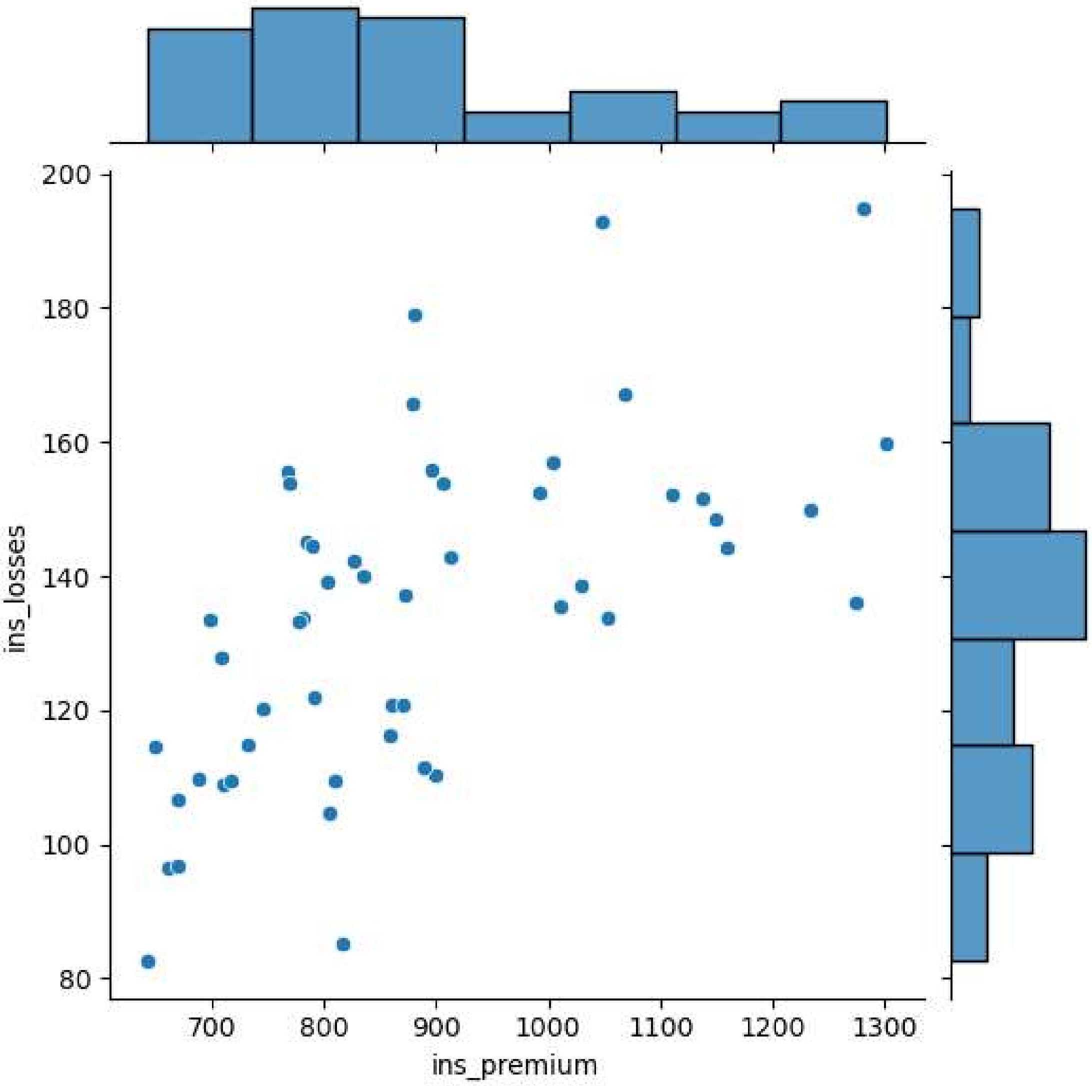


Inference: From above graph State ND,SC has maximium no of drivers in fatal collosion

Joint Plot

In [93]:
```
sns.jointplot(x="ins_premium",y="ins_losses",data=dataset)
```

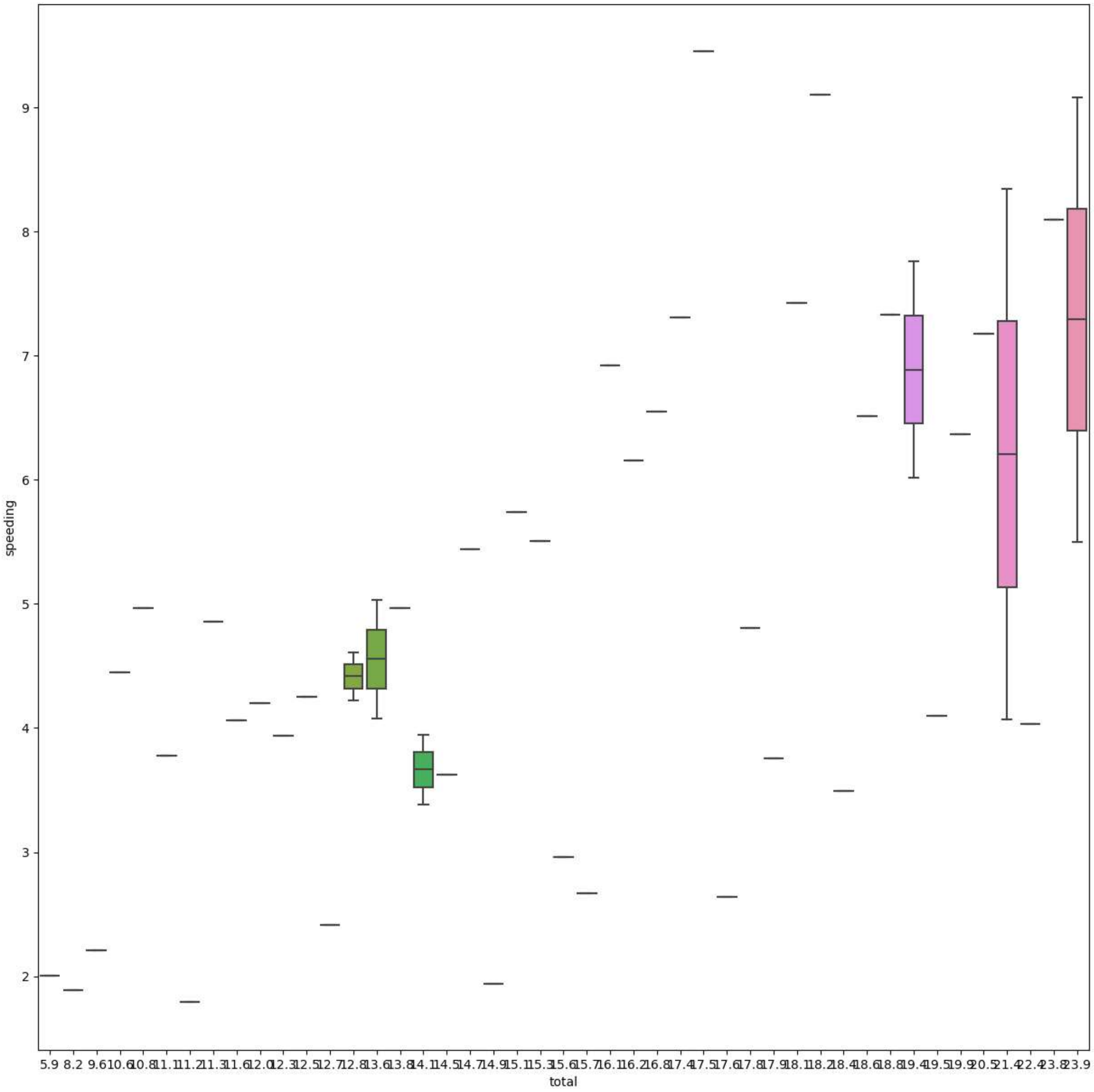
Out[93]:
```
<seaborn.axisgrid.JointGrid at 0x14228eae250>
```



Inference: ins_premium and ins_losses are linearly proportional

```
In [95]:  plt.figure(figsize=(15,15))
          sns.boxplot(x="total",y="speeding",data=dataset)
```

```
Out[95]: <Axes: xlabel='total', ylabel='speeding'>
```



Inference: from above graph outliners are not there