DEVANSHI PATEL

assignment2

September 13, 2023

[1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

[2]:
```
df = sns.load_dataset('car_crashes')
df
```

[2]:

	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

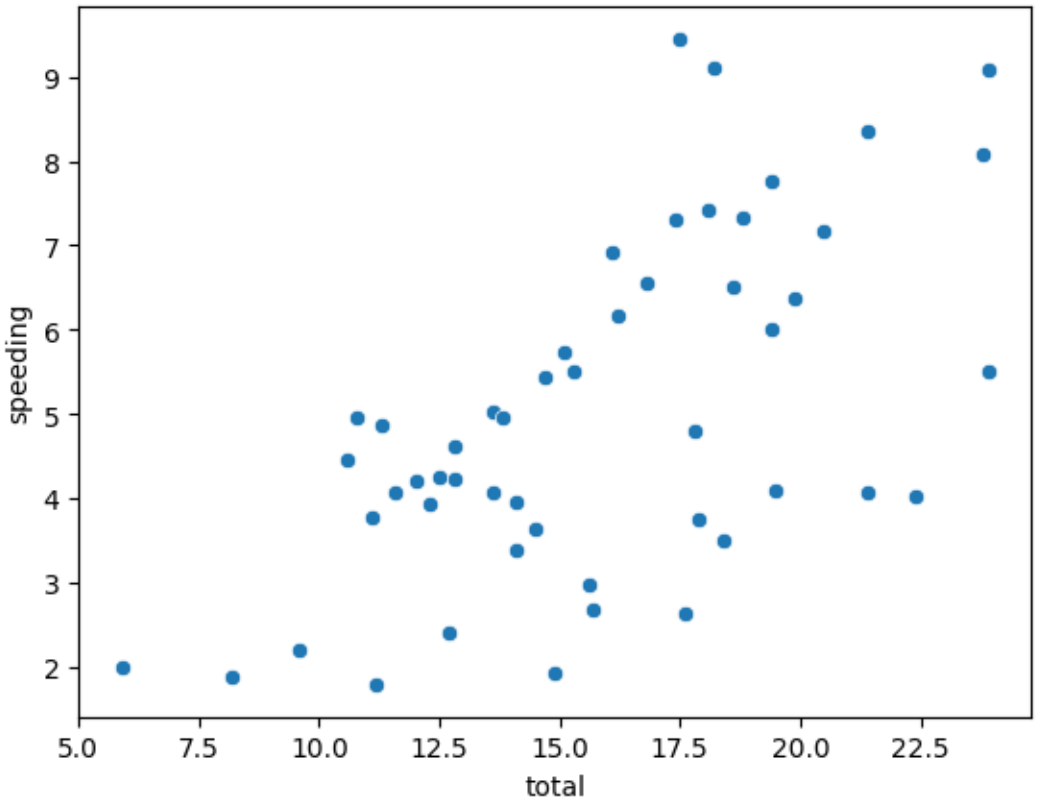
```
22      152.26     MI
23      133.35     MN
24      155.77     MS
25      144.45     MO
26       85.15     MT
27      114.82     NE
28      138.71     NV
29      120.21     NH
30      159.85     NJ
31      120.75     NM
32      150.01     NY
33      127.82     NC
34      109.72     ND
35      133.52     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
```

[3]:
```
df.info()   #information
```

```
<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
```

[4]:
```
sns.scatterplot(x="total",y="speeding",data=df)
```

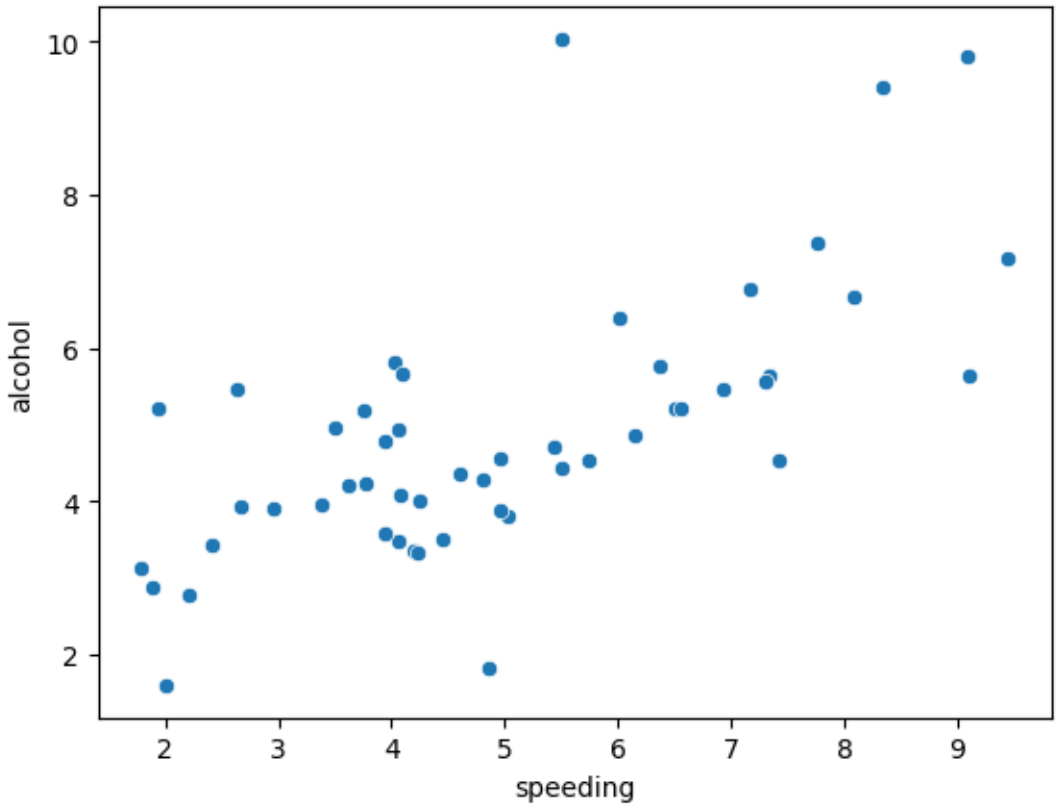
[4]:
```
<Axes: xlabel='total', ylabel='speeding'>
```



Inference – From the above scatter graph we can see that it is positive weak correlation graph.

[5]:
```
sns.scatterplot(x="speeding",y="alcohol",data=df)
```

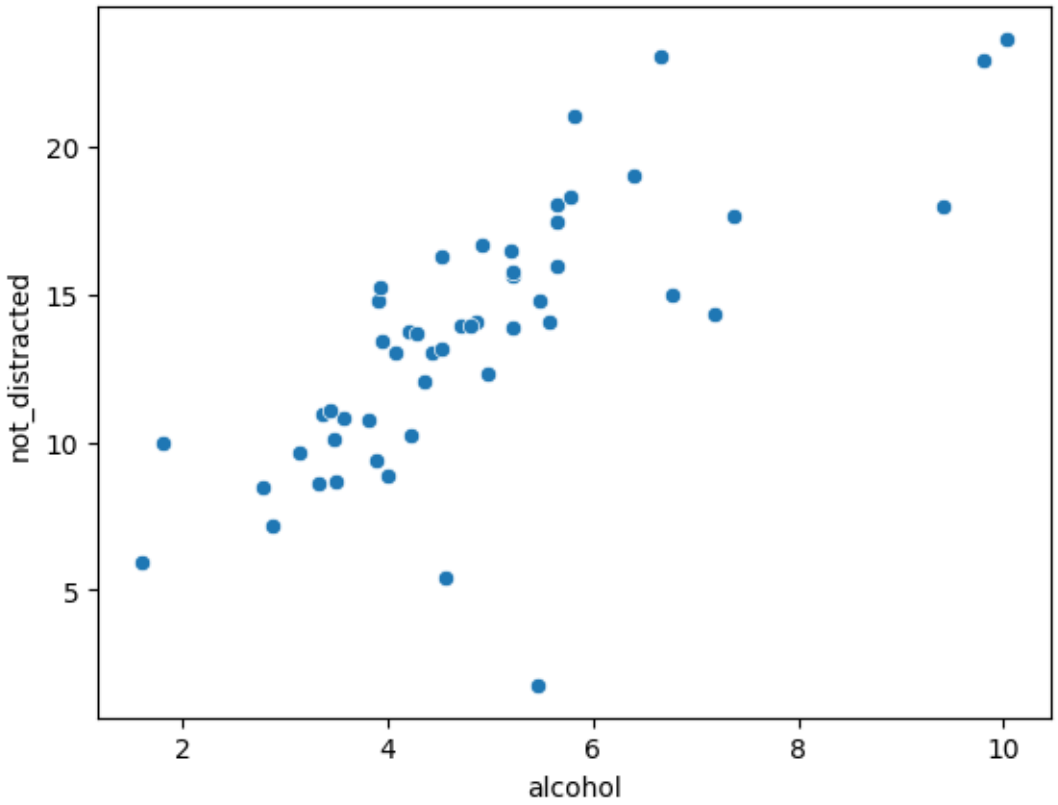
[5]:
```
<Axes: xlabel='speeding', ylabel='alcohol'>
```



Inference – From the above scatter graph we can see that it is positive correlation graph.

[6]:
```
sns.scatterplot(x="alcohol",y="not_distracted",data=df)
```

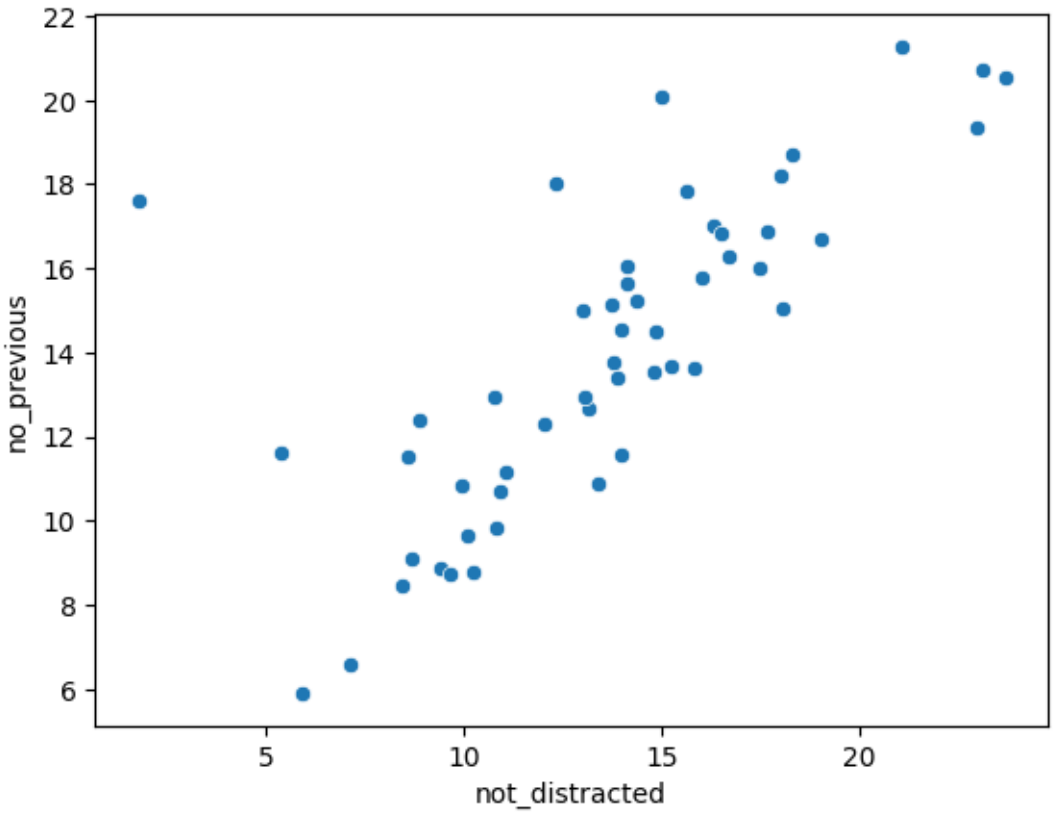
[6]:
```
<Axes: xlabel='alcohol', ylabel='not_distracted'>
```



Inference – From the above scatter graph we can see that it is positive correlation graph.

[7]:
```
sns.scatterplot(x="not_distracted",y="no_previous",data=df)
```

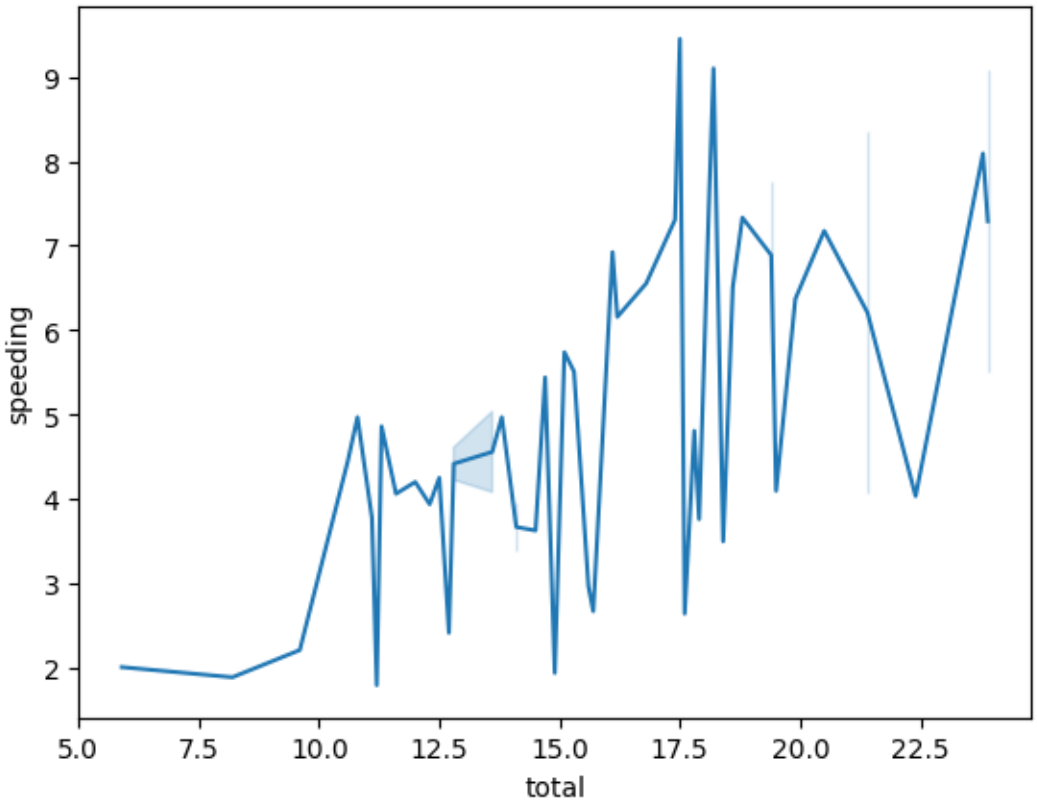
[7]:
```
<Axes: xlabel='not_distracted', ylabel='no_previous'>
```



Inference – From the above scatter graph we can see that it is positive correlation graph.

[8]:
```
sns.lineplot(x="total",y="speeding",data=df)
```

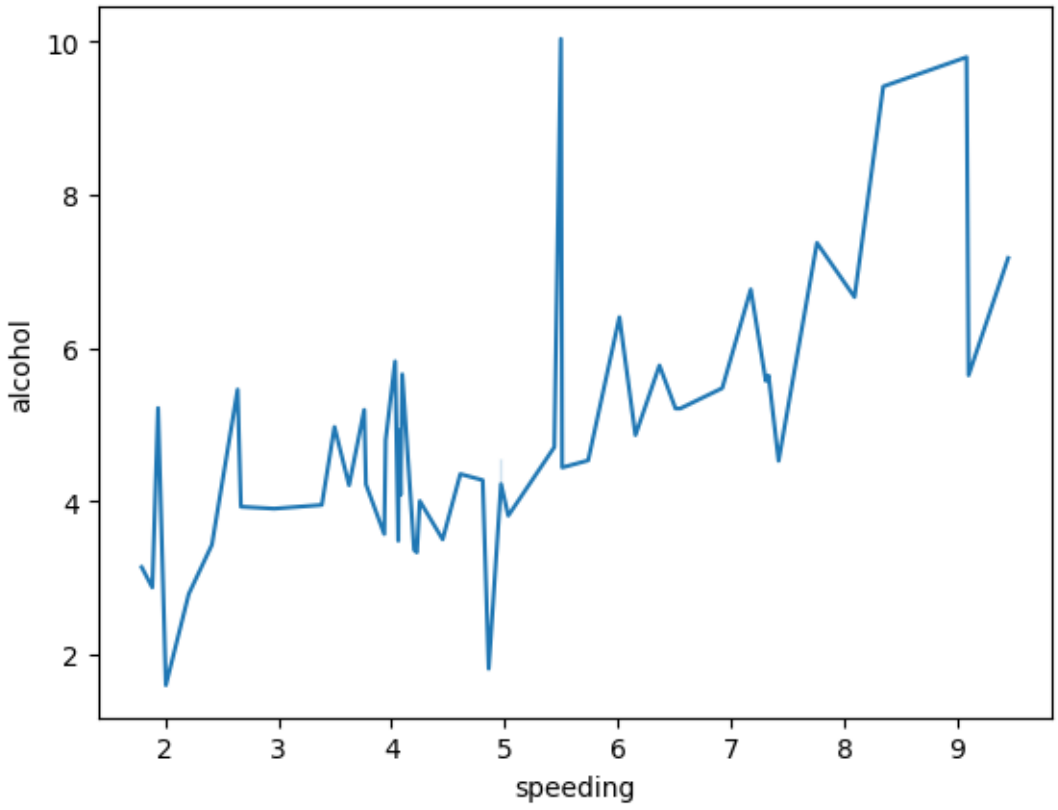
[8]:
```
<Axes: xlabel='total', ylabel='speeding'>
```



Inference – From the above line graph we can see that there is no such particular relation between total and speeding values i.e., sometimes it increases and sometimes it decreases.

[9]:
```
sns.lineplot(x="speeding",y="alcohol",data=df)
```

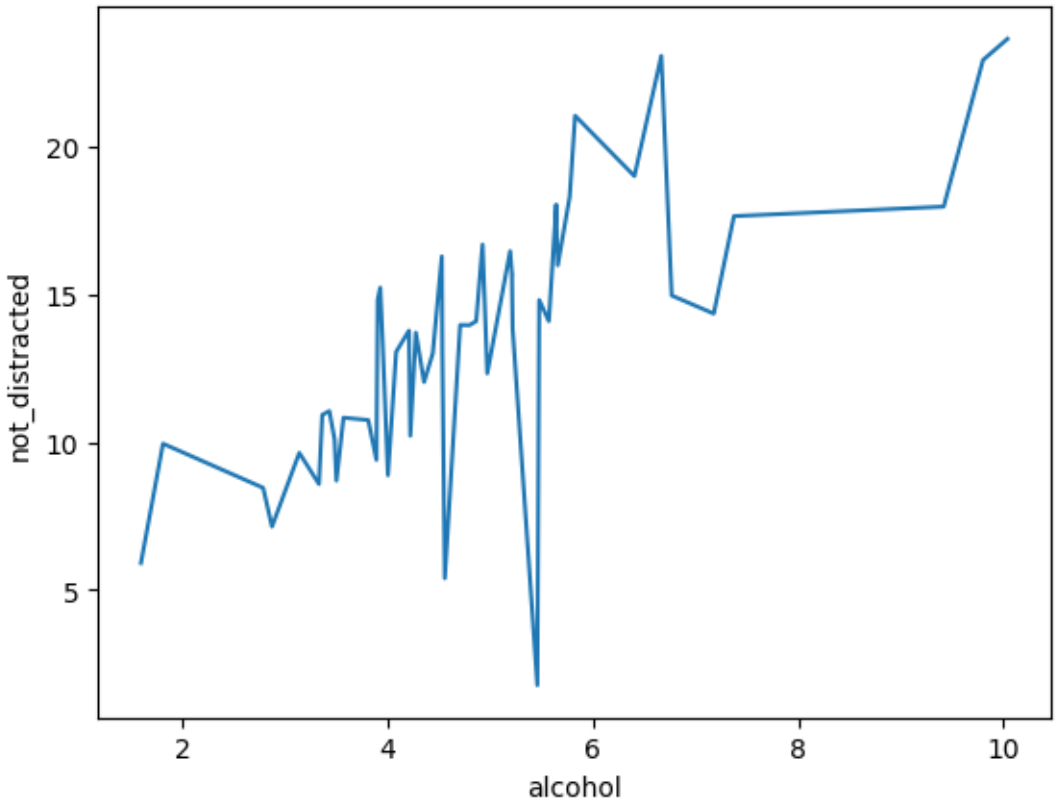
[9]:
```
<Axes: xlabel='speeding', ylabel='alcohol'>
```



Inference – From the above line graph we can see that there is no such particular relation between speeding and alcohol values i.e., sometimes it increases and sometimes it decreases.

[10]:
```
sns.lineplot(x="alcohol",y="not_distracted",data=df)
```

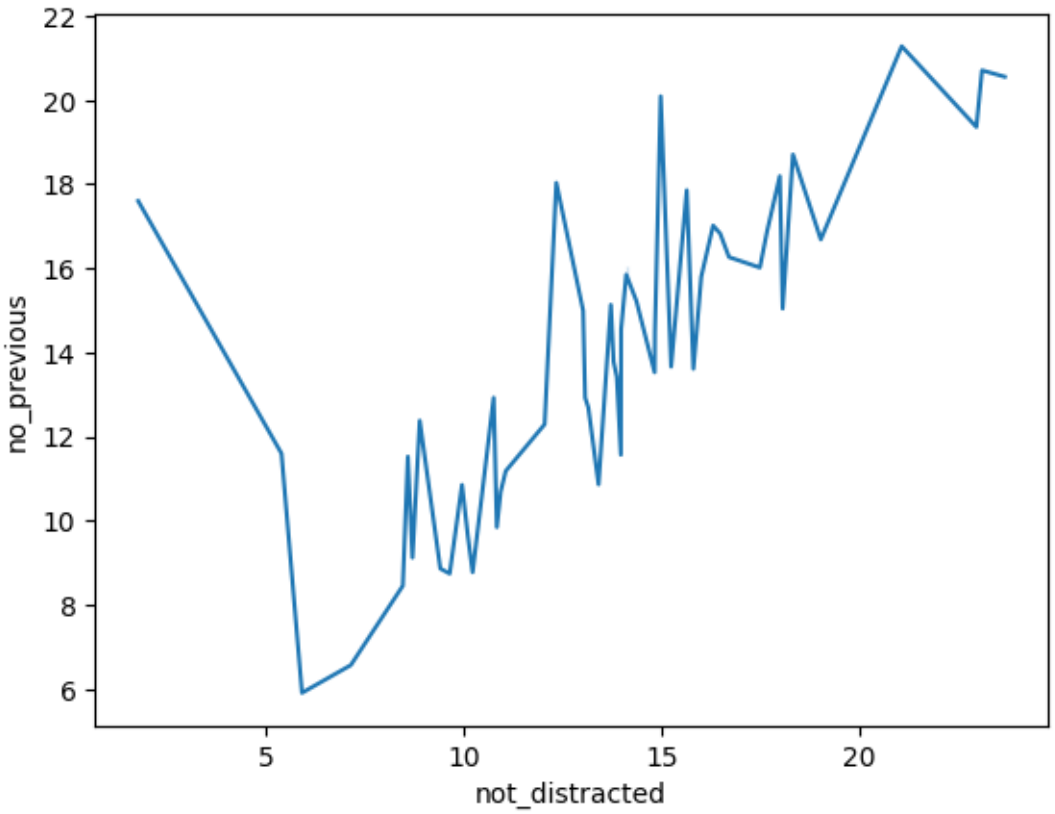
[10]:
```
<Axes: xlabel='alcohol', ylabel='not_distracted'>
```



Inference – From the above line graph we can see that there is no such particular relation between alcohol and not distracted values i.e., sometimes it increases and sometimes it decreases but most of the time it increases.

[11]:
```
sns.lineplot(x="not_distracted",y="no_previous",data=df)
```

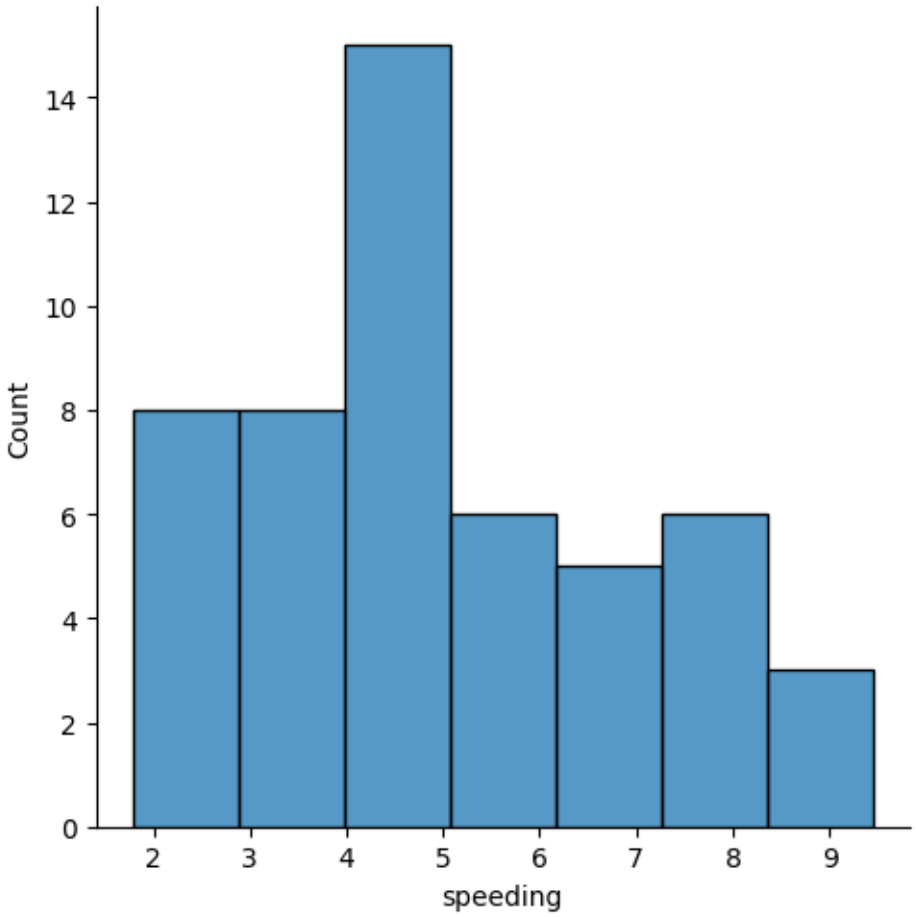
[11]:
```
<Axes: xlabel='not_distracted', ylabel='no_previous'>
```



Inference – From the above line graph we can see that there is no such particular relation between not distracted and no previous values i.e., sometimes it increases and sometimes it decreases but at starting first the value drops then it's increasing gradually/

[21]:
```
sns.displot(df["speeding"])
```

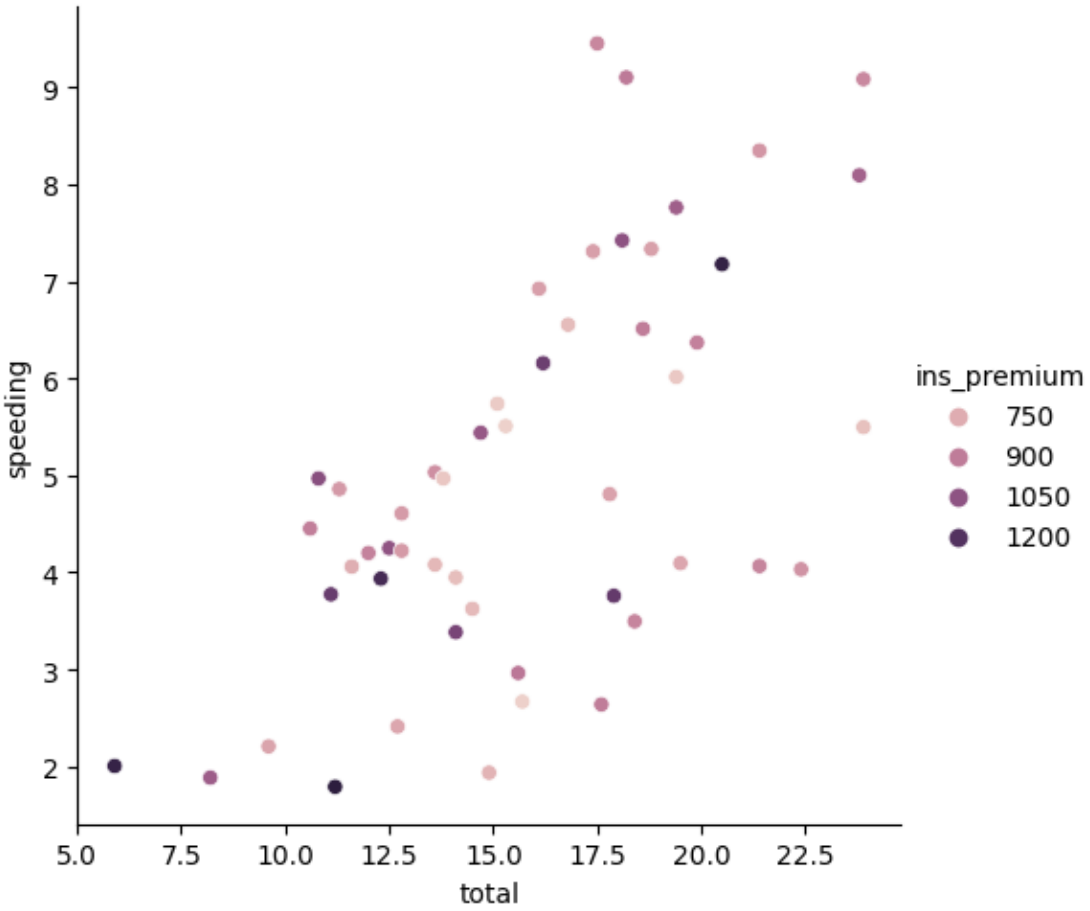
[21]: <seaborn.axisgrid.FacetGrid at 0x7ba72e052ad0>



Inference – Between 4 to 5 the count value is maximum and in different speeding values the average is around 6.

[13]:
```
sns.relplot(x="total",y="speeding",data=df,hue="ins_premium")
```

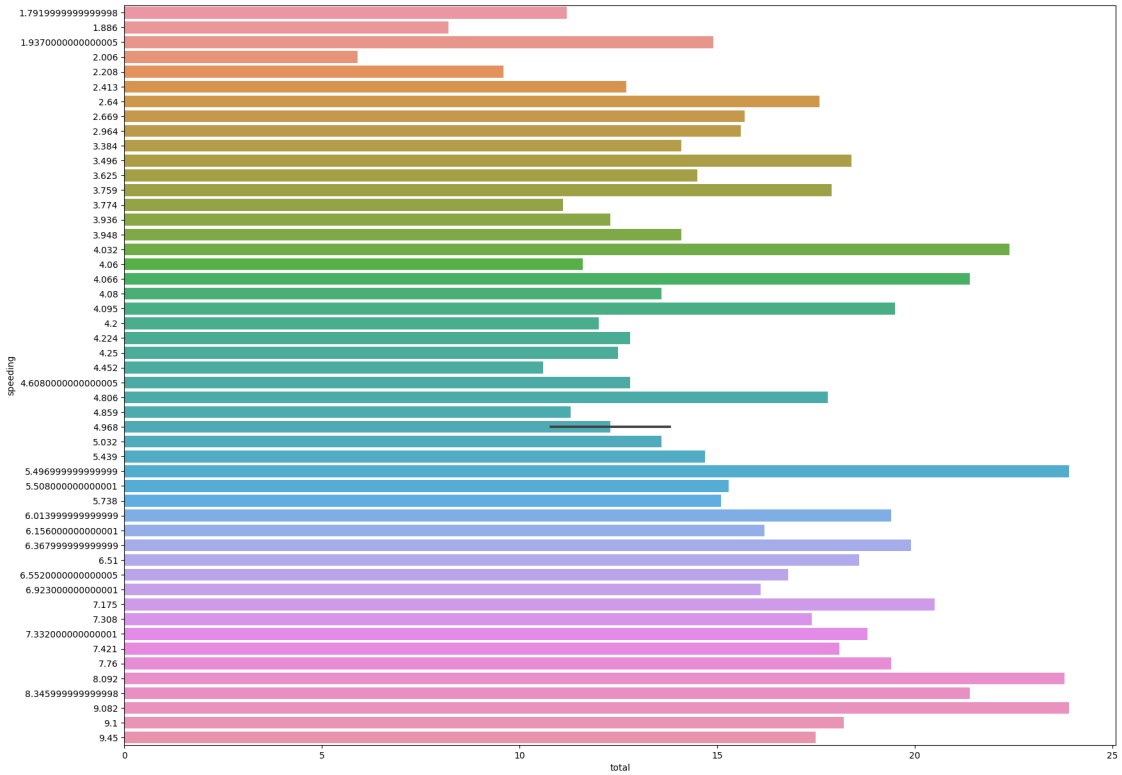
[13]:
```
<seaborn.axisgrid.FacetGrid at 0x7ba72dd1fd30>
```



Inference – The above graph is a scatter plot with different colors which indicates different values.

[14]:
```
plt.subplots(figsize=(20,15))
sns.barplot(data=df,x="total",y="speeding",orient='h')
```

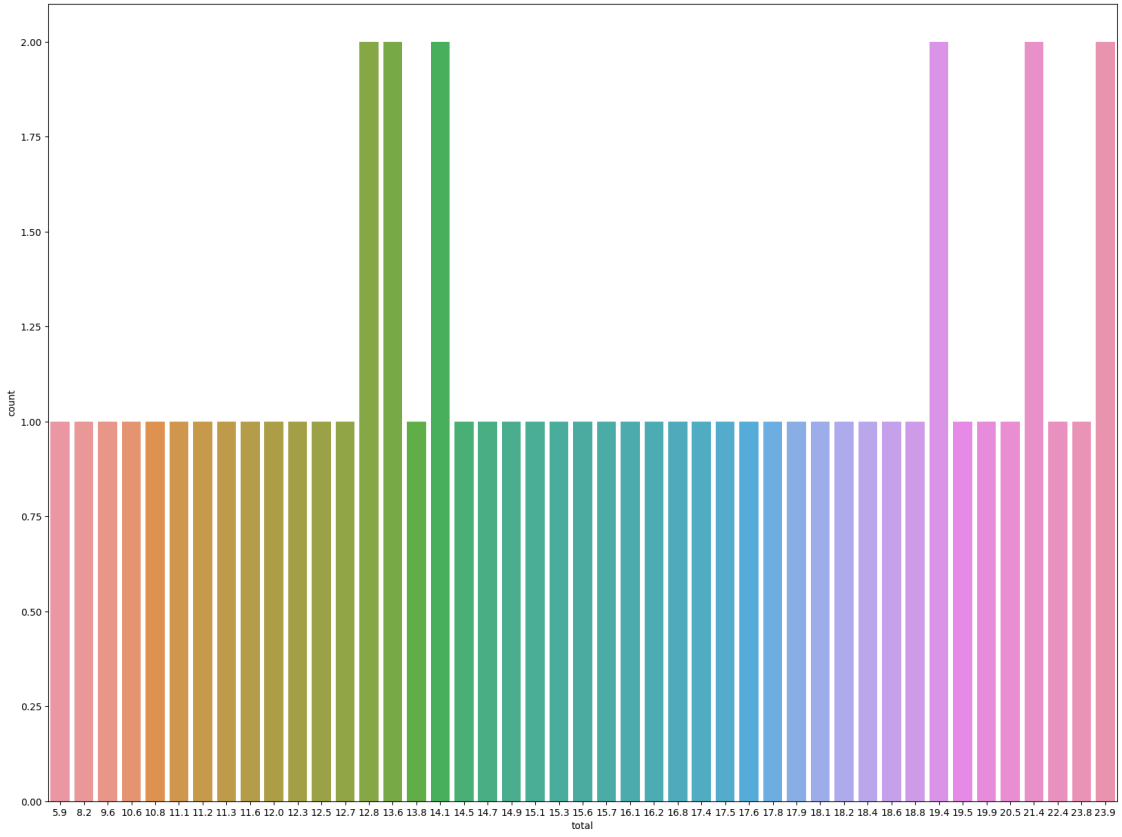
[14]: <Axes: xlabel='total', ylabel='speeding'>



Inference – The above graph is bar plot which is total vs speeding graph.

[15]:
```
plt.subplots(figsize=(20,15))
sns.countplot(x="total",data=df)
```

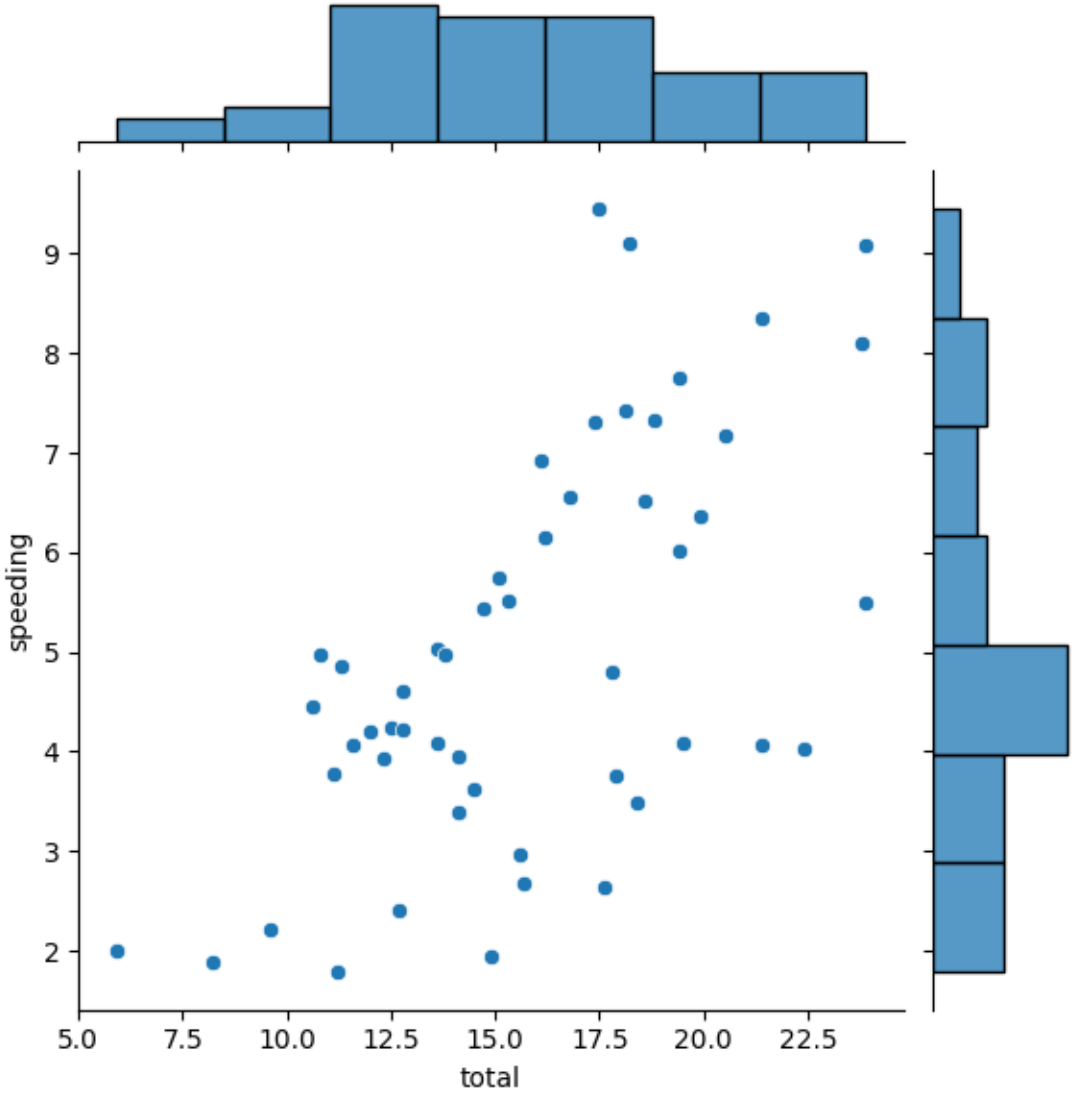
[15]:
```
<Axes: xlabel='total', ylabel='count'>
```



Inference – The above count graph is of total vs count and the maximum count is around 2.

[16]:
```
sns.jointplot(x="total",y="speeding",data=df)
```

[16]:
```
<seaborn.axisgrid.JointGrid at 0x7ba72ba1a050>
```

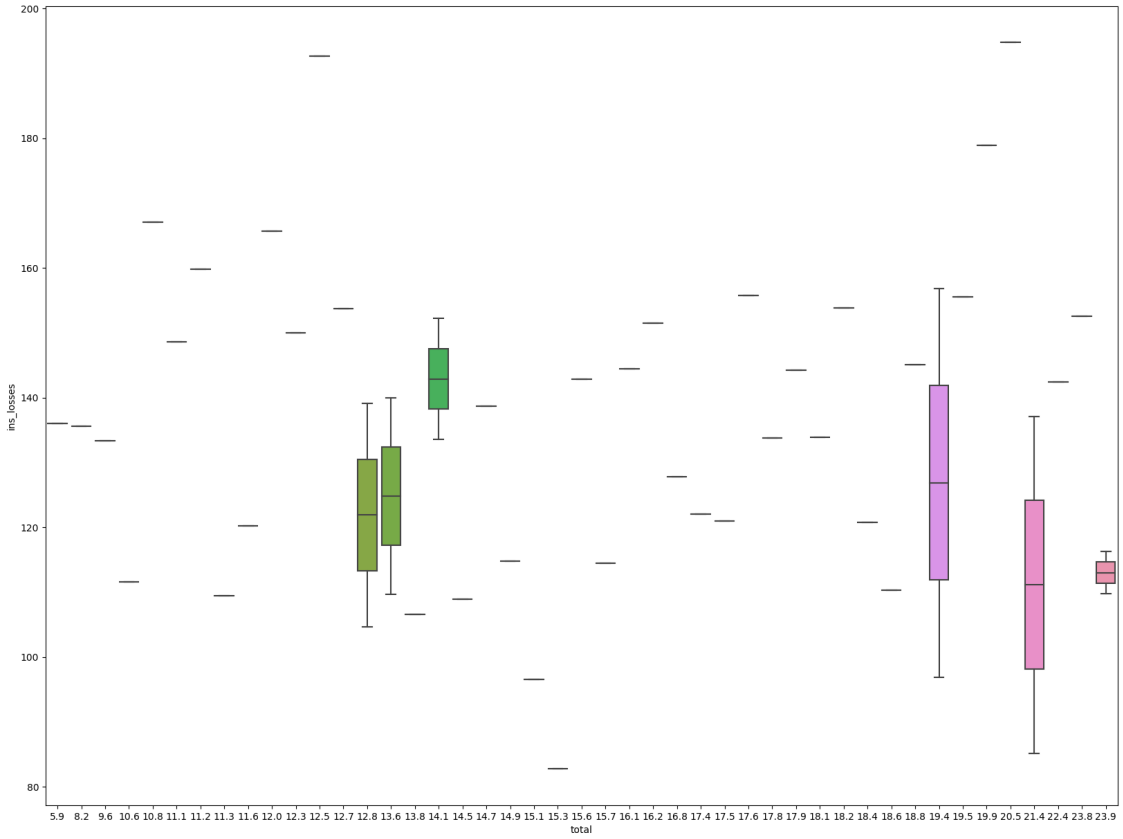


Inference – The above graph is joint graph which is combination of scatter plot and histogram or bar plot.

#Box Plot

[17]:
```
plt.subplots(figsize=(20,15))
sns.boxplot(x="total",y="ins_losses",data=df)
```

[17]:
```
<Axes: xlabel='total', ylabel='ins_losses'>
```



[18]:
```
corr = df.corr()
corr
```

```
<ipython-input-18-4381f08f6434>: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()
```

[18]:

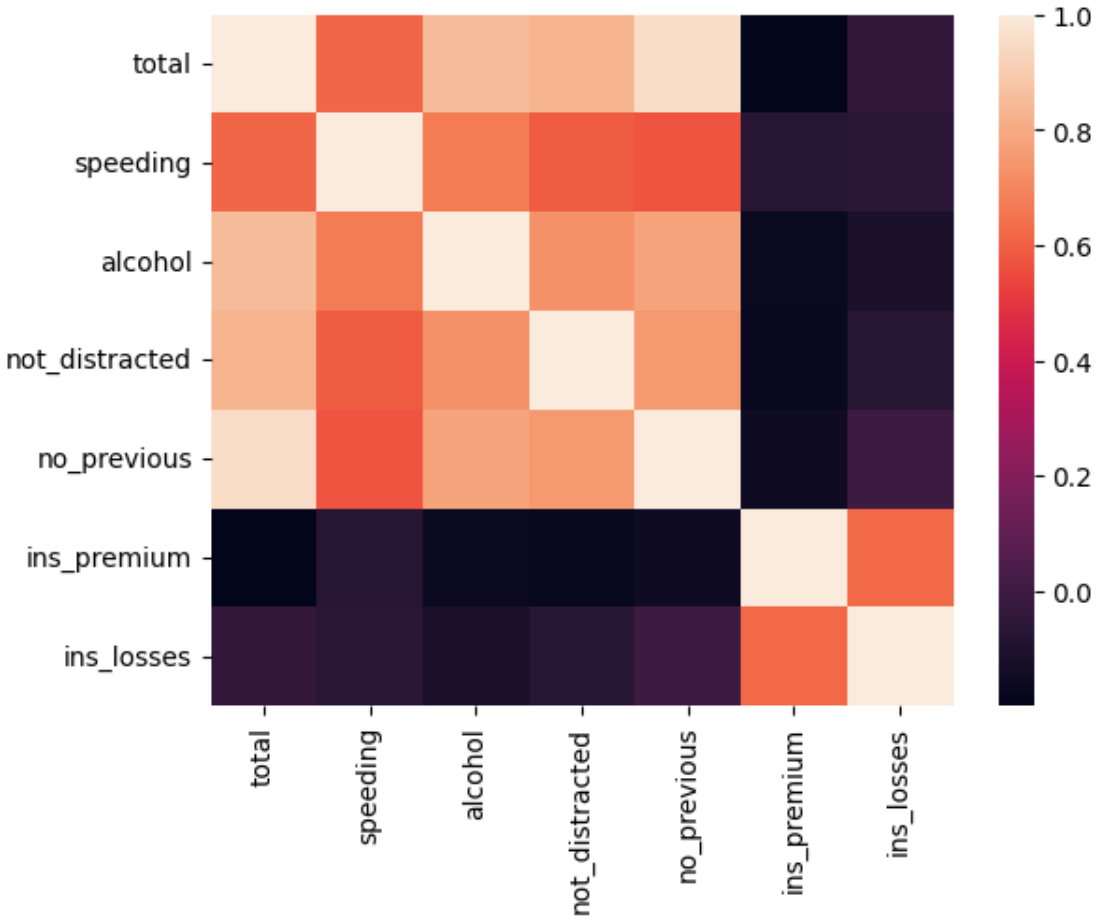
	total	speeding	alcohol	not_distracted	no_previous	\
total	1.000000	0.611548	0.852613	0.827560	0.956179	
speeding	0.611548	1.000000	0.669719	0.588010	0.571976	
alcohol	0.852613	0.669719	1.000000	0.732816	0.783520	
not_distracted	0.827560	0.588010	0.732816	1.000000	0.747307	
no_previous	0.956179	0.571976	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
```

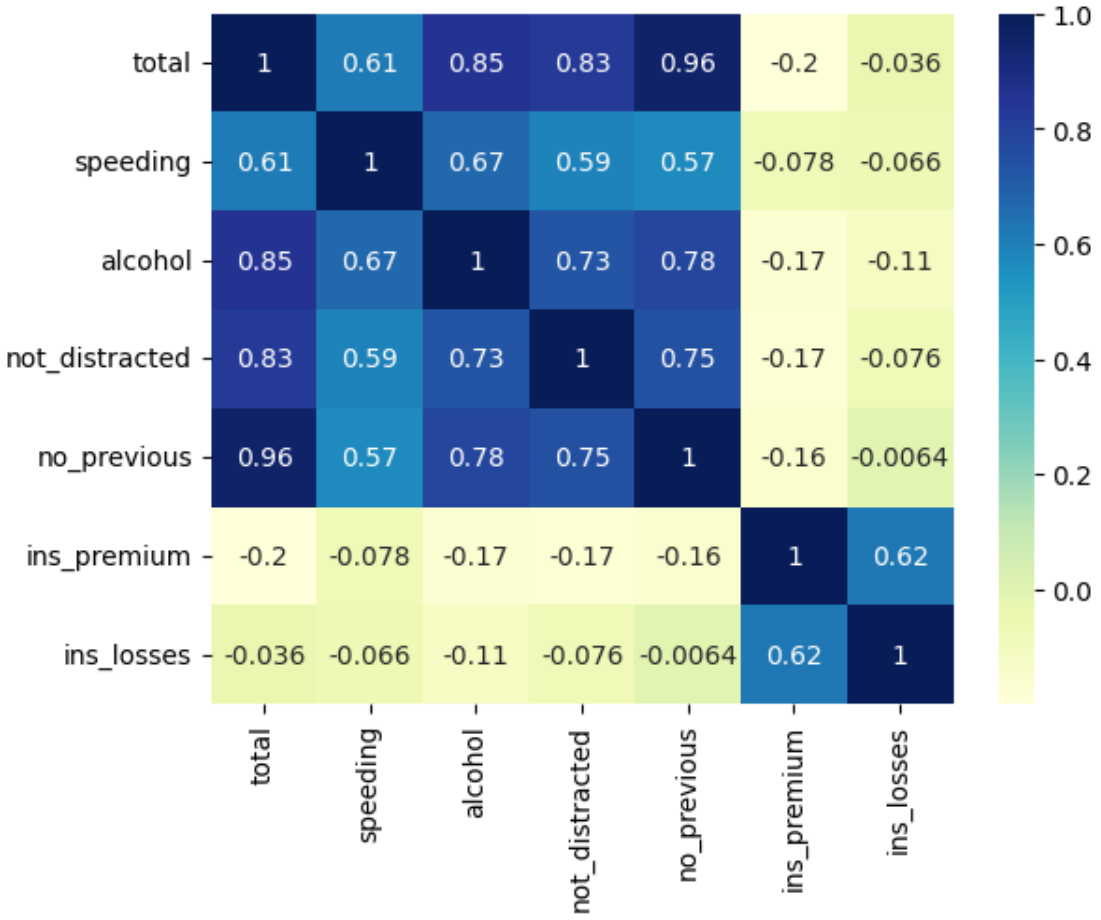
[19]:
```
sns.heatmap(corr)
```

[19]: <Axes: >



[20]:
```
sns.heatmap(corr,annot=True,cmap="YlGnBu")
```

[20]: <Axes: >


total
speeding
alcohol
not_distracted
no_previous
ins_premium
ins_losses
1 0.61 0.85 0.83 0.96 -0.2 -0.036
0.61 1 0.67 0.59 0.57 -0.078 -0.066
0.85 0.67 1 0.73 0.78 -0.17 -0.11
0.83 0.59 0.73 1 0.75 -0.17 -0.076
0.96 0.57 0.78 0.75 1 -0.16 -0.0064
-0.2 -0.078 -0.17 -0.17 -0.16 1 0.62
-0.036 -0.066 -0.11 -0.076 -0.0064 0.62 1
1.0
0.8
0.6
0.4
0.2
0.0

[20]: