```python
import seaborn as sns
import matplotlib.pyplot as plt

#sns.download("car_crashes")
data = sns.load_dataset("car_crashes")

print(data.head())

print("Dataframe dimensions: ", data.shape)
```

```
   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
Dataframe dimensions:  (51, 8)
```

```python
data.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
```

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

```
data.iloc[:,-1].unique
```

```
<bound method Series.unique of 0      AL
1      AK
2      AZ
3      AR
4      CA
5      CO
6      CT
7      DE
8      DC
9      FL
10     GA
11     HI
12     ID
13     IL
14     IN
15     IA
16     KS
17     KY
18     LA
19     ME
20     MD
21     MA
22     MI
23     MN
24     MS
25     MO
26     MT
27     NE
```

```
28      NV
29      NH
30      NJ
31      NM
32      NY
33      NC
34      ND
35      OH
36      OK
37      OR
38      PA
39      RI
40      SC
41      SD
42      TN
43      TX
44      UT
45      VT
46      VA
47      WA
48      WV
49      WI
50      WY
Name: abbrev, dtype: object>
```

```
data["abbrev"].value_counts()
```

```
abbrev
AL      1
PA      1
NV      1
NH      1
NJ      1
NM      1
NY      1
NC      1
ND      1
OH      1
OK      1
OR      1
RI      1
MT      1
SC      1
SD      1
TN      1
TX      1
UT      1
VT      1
VA      1
WA      1
```

```
WV    1
WI    1
NE    1
MO    1
AK    1
ID    1
AZ    1
AR    1
CA    1
CO    1
CT    1
DE    1
DC    1
FL    1
GA    1
HI    1
IL    1
MS    1
IN    1
IA    1
KS    1
KY    1
LA    1
ME    1
MD    1
MA    1
MI    1
MN    1
WY    1
Name: count, dtype: int64
```
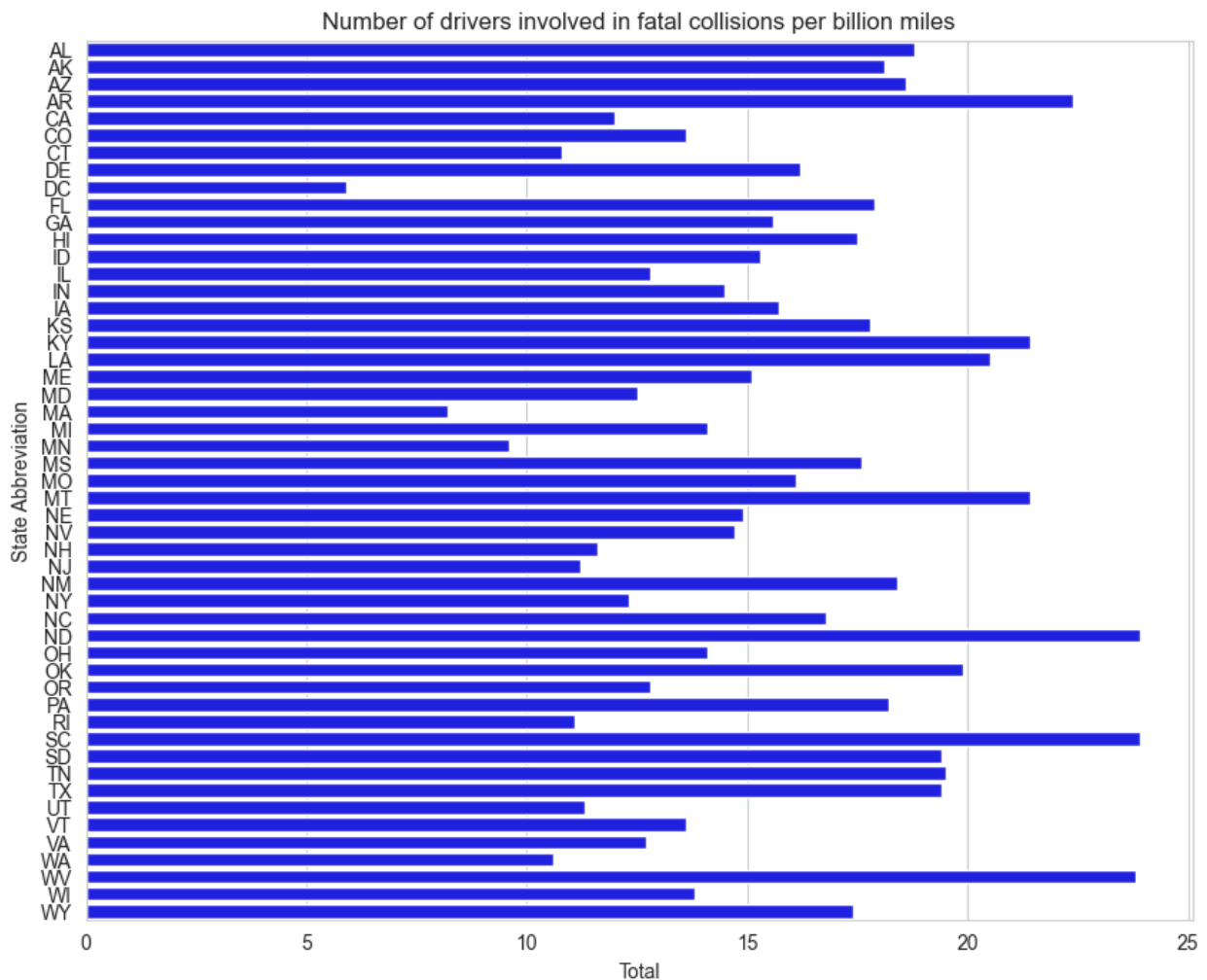
The horizontal bar plot shows the number of drivers
involved in fatal collisions per billion miles for each state.
The state with the highest number of drivers involved in
fatal collisions is Mississippi, while the state with the
lowest number of drivers involved in fatal collisions is
Massachusetts.

```python
plt.figure(figsize=(10, 8))
sns.set_style("whitegrid")
sns.barplot(x="total", y="abbrev", data=data, color="b")
plt.title("Number of drivers involved in fatal collisions per billion
miles")
plt.xlabel("Total")
plt.ylabel("State Abbreviation")
plt.show()
```

```
E:\Installed softwares\Py 3.10.7\lib\site-packages\seaborn\
_oldcore.py:1498: FutureWarning: is_categorical_dtype is deprecated
and will be removed in a future version. Use isinstance(dtype,
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Number of drivers involved in fatal collisions per billion miles

The scatter plot shows the relationship between the number of drivers involved in fatal collisions who were speeding and the number of drivers involved in fatal collisions who were alcohol-impaired. There seems to be a positive correlation between these two variables, indicating that drivers who are more likely to speed are also more likely to drive under the influence of alcohol.

```python
plt.figure(figsize=(10, 8))
sns.set_style("whitegrid")
sns.scatterplot(x="speeding", y="alcohol", data=data, color="b")
plt.title("Number of drivers involved in fatal collisions who were
speeding vs. alcohol-impaired")
plt.xlabel("Number of drivers involved in fatal collisions who were
speeding")
plt.ylabel("Number of drivers involved in fatal collisions who were
alcohol-impaired")
plt.show()
```

```
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```
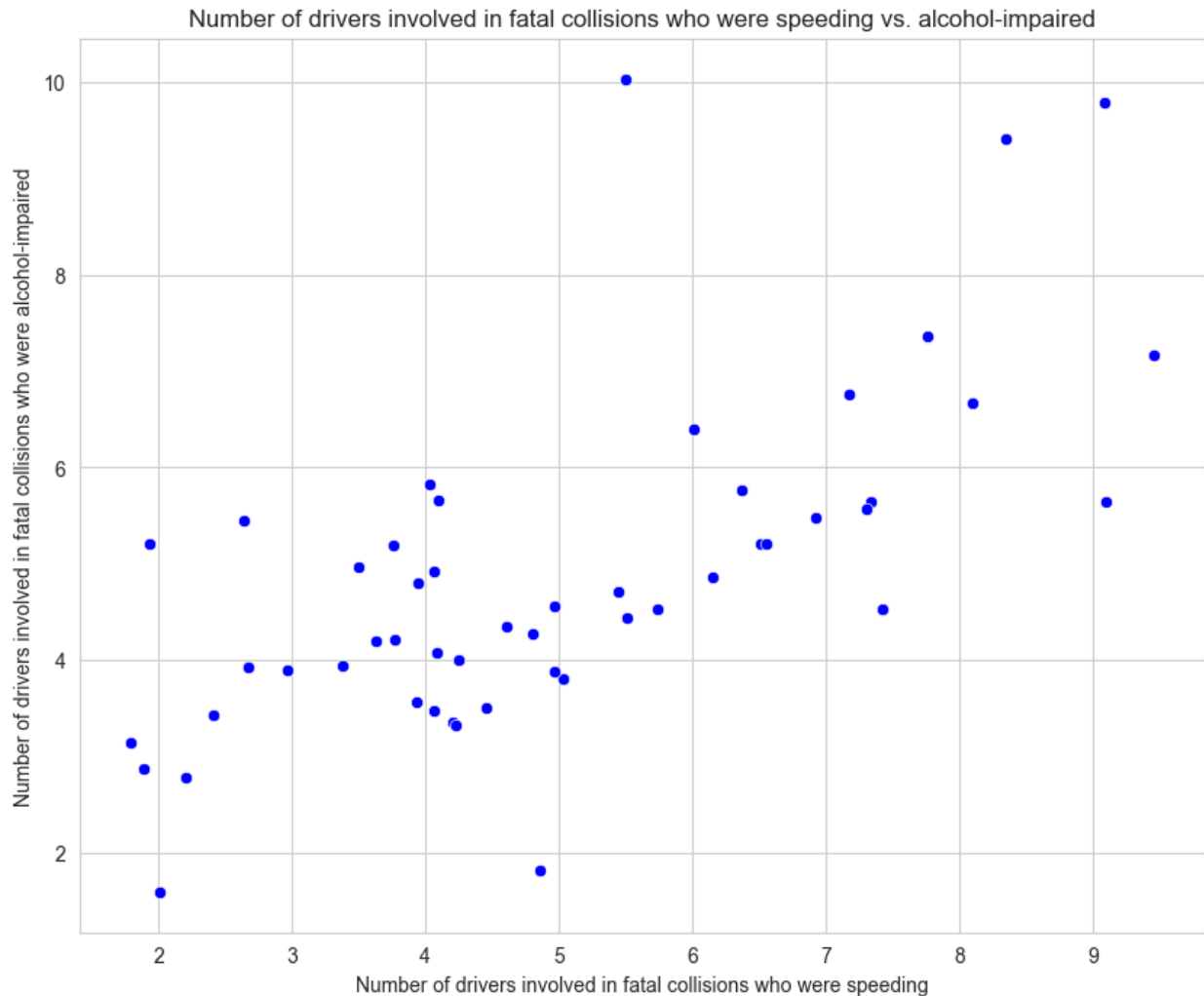
Number of drivers involved in fatal collisions who were speeding vs. alcohol-impaired

The scatter plot shows the relationship between the number of drivers involved in fatal collisions who were speeding and the number of drivers involved in fatal collisions who were alcohol-impaired. The graph shows country wise plot with different color encoding.

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

```
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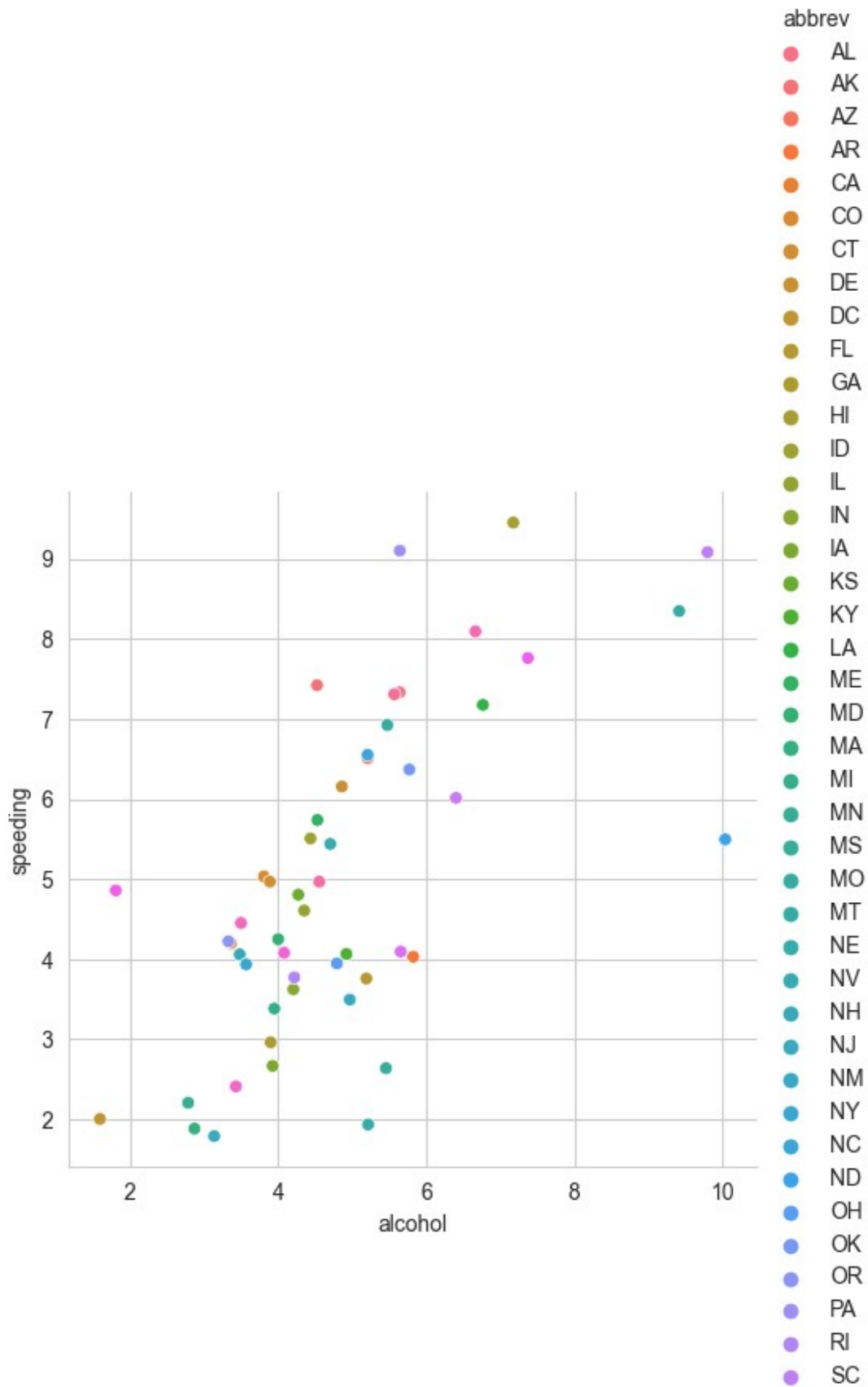
```
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```

```
<seaborn.axisgrid.FacetGrid at 0x2960dc4a1d0>
```

The pair plot shows pairwise relationships between different variables in the dataset. For example, we can see that there is a positive correlation between the number of drivers involved in fatal collisions who were speeding and the number of drivers involved in fatal collisions who were alcohol-impaired. We can also see that there is a negative correlation between the number of drivers involved in fatal collisions who were not distracted and the number of drivers involved in fatal collisions who had no previous accidents.

```
sns.pairplot(data)

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  with pd.option_context('mode.use_inf_as_na', True):
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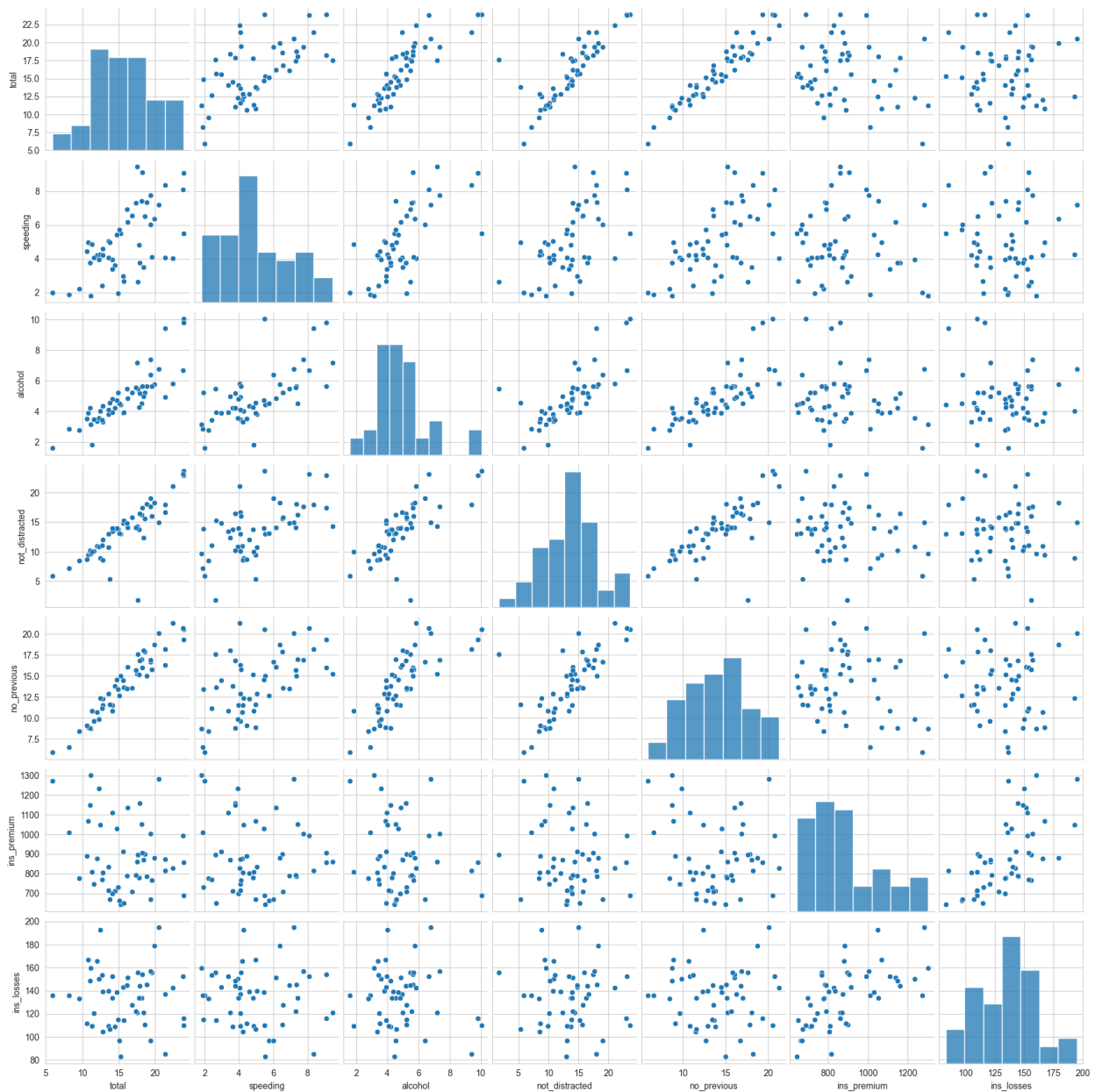
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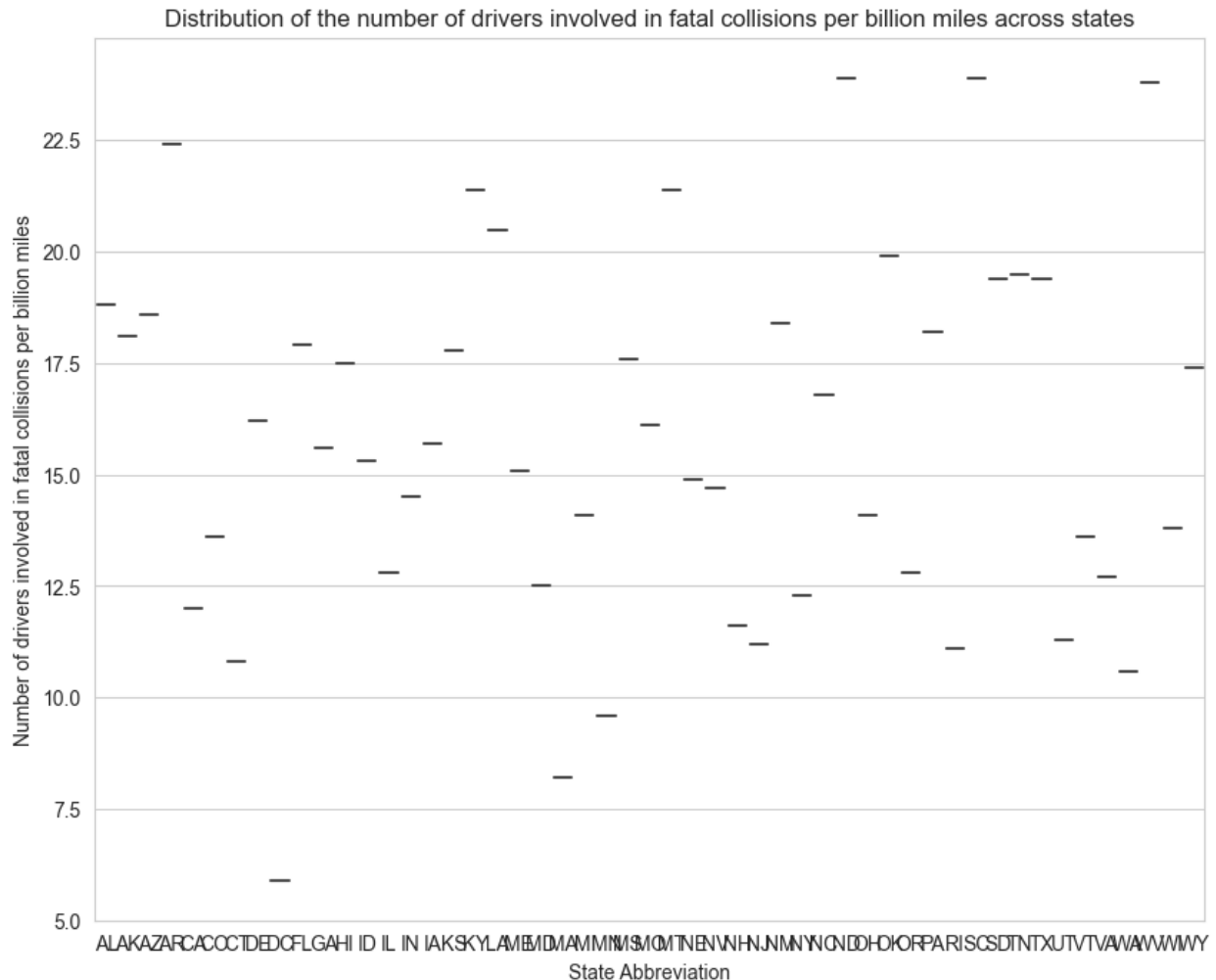
The violin plot shows the distribution of the number of drivers involved in fatal collisions per billion miles across different states. The plot indicates that the distribution is skewed to the right, with most states having a lower number of drivers involved in fatal collisions.

```python
plt.figure(figsize=(10, 8))
sns.set_style("whitegrid")
sns.violinplot(x="abbrev", y="total", data=data, color="b")
plt.title("Distribution of the number of drivers involved in fatal
collisions per billion miles across states")
plt.xlabel("State Abbreviation")
plt.ylabel("Number of drivers involved in fatal collisions per billion
miles")
plt.show()

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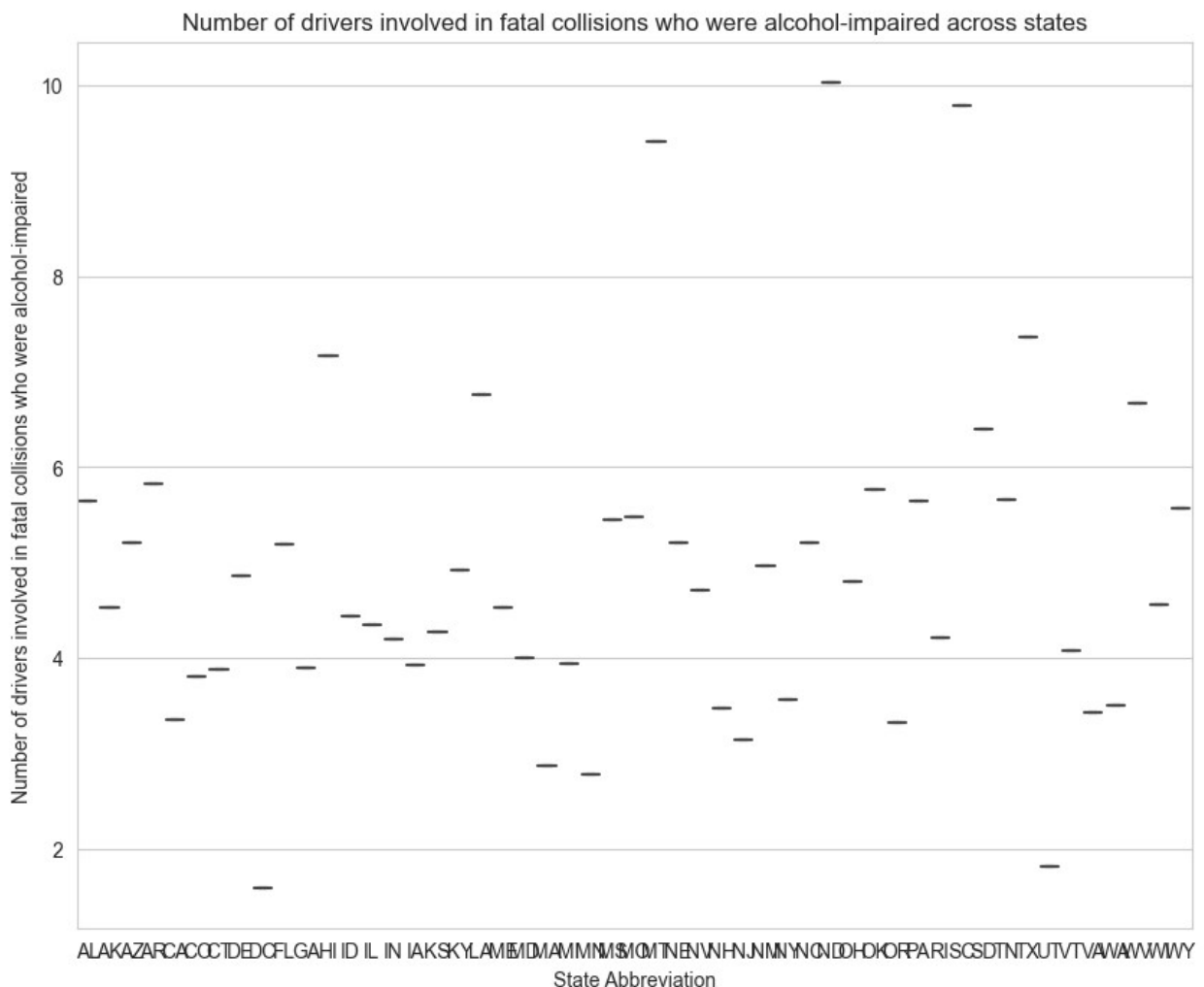Distribution of the number of drivers involved in fatal collisions per billion miles across states

The box plot shows the distribution of the number of drivers involved in fatal collisions who were alcohol-impaired across different states. The plot indicates that the median number of drivers involved in fatal collisions who were alcohol-impaired is higher for some states such as Montana and North Dakota.

```python
plt.figure(figsize=(10, 8))
sns.set_style("whitegrid")
sns.boxplot(x="abbrev", y="alcohol", data=data, color="b")
plt.title("Number of drivers involved in fatal collisions who were
alcohol-impaired across states")
plt.xlabel("State Abbreviation")
plt.ylabel("Number of drivers involved in fatal collisions who were
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alcohol-impaired")
plt.show()
```

```
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```


Number of drivers involved in fatal collisions who were alcohol-impaired across states

The heatmap shows the correlation between different variables in the car crash dataset. The plot indicates that there is a positive correlation between the number of drivers involved in fatal collisions who were speeding and the number of drivers involved in fatal collisions who were alcohol-impaired. We can also see that there is a negative correlation between the number of drivers involved in fatal collisions who were not distracted and the number of drivers involved in fatal collisions who had no previous accidents.

```
corr = data.iloc[:, :-1].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

plt.figure(figsize=(10, 8))
sns.set_style("whitegrid")
sns.heatmap(corr, cmap="coolwarm", annot=True)
plt.title("Correlation between different variables in the car crash
```

```
dataset")
plt.show()
```

Correlation between different variables in the car crash dataset
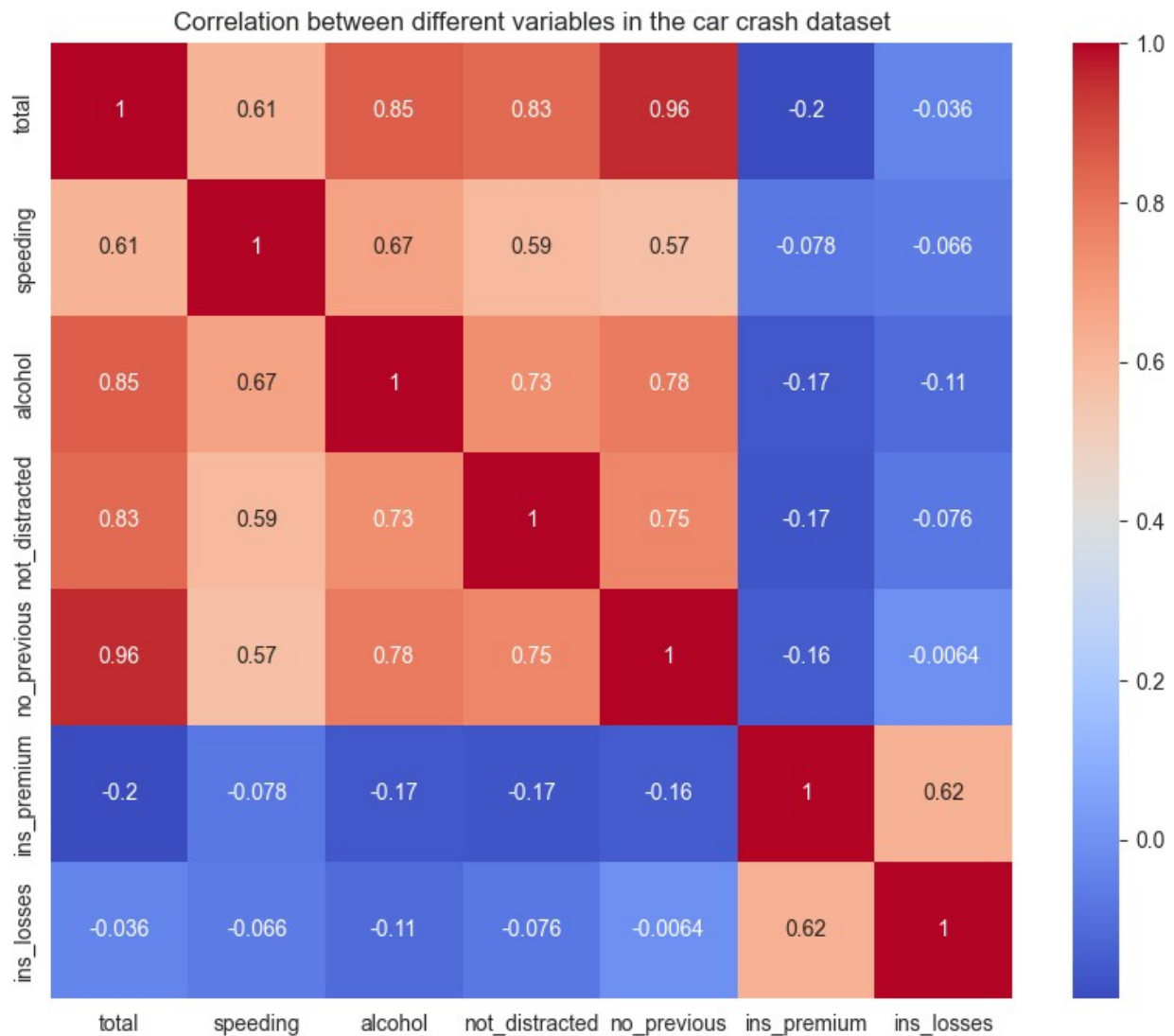
The line plot shows the car insurance premiums across different states. The plot indicates that the state with the highest car insurance premiums is Michigan, while the state with the lowest car insurance premiums is Maine.

```
plt.figure(figsize=(10, 8))
sns.set_style("whitegrid")
sns.lineplot(x="abbrev", y="ins_premium", data=data, color="b")
plt.title("Car insurance premiums ($) across states")
plt.xlabel("State Abbreviation")
```

```
plt.ylabel("Car insurance premiums ($)")
plt.show()

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_oldcore.py:1498: FutureWarning: is_categorical_dtype is deprecated
and will be removed in a future version. Use isinstance(dtype,
CategoricalDtype) instead
  if pd.api.types.is_categorical_dtype(vector):
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before operating instead.
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```

Car insurance premiums ($) across states