In [ ]:
```python
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sb
```

Pandas Library

In [ ]:
```python
df = pd.read_csv("auto-mpg.csv")
df.head()
```

Out[ ]:

	mpg	cylinders	displacement	horsepower	weight	acceleration	model year	origin	car name
0	18.0	8	307.0	130	3504	12.0	70	1	chevrolet chevelle malibu
1	15.0	8	350.0	165	3693	11.5	70	1	buick skylark 320
2	18.0	8	318.0	150	3436	11.0	70	1	plymouth satellite
3	16.0	8	304.0	150	3433	12.0	70	1	amc rebel sst
4	17.0	8	302.0	140	3449	10.5	70	1	ford torino

In [ ]:
```python
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 398 entries, 0 to 397
Data columns (total 9 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   mpg           398 non-null    float64
 1   cylinders     398 non-null    int64
 2   displacement  398 non-null    float64
 3   horsepower    398 non-null    object
 4   weight        398 non-null    int64
 5   acceleration  398 non-null    float64
 6   model year    398 non-null    int64
 7   origin        398 non-null    int64
 8   car name      398 non-null    object
dtypes: float64(3), int64(4), object(2)
memory usage: 28.1+ KB
```

In [ ]:
```python
df.describe()
```

Out[ ]:

	mpg	cylinders	displacement	weight	acceleration	model year	origin
count	398.000000	398.000000	398.000000	398.000000	398.000000	398.000000	398.000000
mean	23.514573	5.454774	193.425879	2970.424623	15.568090	76.010050	1.572864
std	7.815984	1.701004	104.269838	846.841774	2.757689	3.697627	0.802055
min	9.000000	3.000000	68.000000	1613.000000	8.000000	70.000000	1.000000
25%	17.500000	4.000000	104.250000	2223.750000	13.825000	73.000000	1.000000
50%	23.000000	4.000000	148.500000	2803.500000	15.500000	76.000000	1.000000
75%	29.000000	8.000000	262.000000	3608.000000	17.175000	79.000000	2.000000
max	46.600000	8.000000	455.000000	5140.000000	24.800000	82.000000	3.000000

In [ ]:
```python
df = df.drop(['car name', 'horsepower'], axis=1)
df
```

Out[ ]:

	mpg	cylinders	displacement	weight	acceleration	model year	origin
0	18.0	8	307.0	3504	12.0	70	1
1	15.0	8	350.0	3693	11.5	70	1
2	18.0	8	318.0	3436	11.0	70	1
3	16.0	8	304.0	3433	12.0	70	1
4	17.0	8	302.0	3449	10.5	70	1
...	...	...	...	...	...	...	...
393	27.0	4	140.0	2790	15.6	82	1
394	44.0	4	97.0	2130	24.6	82	2
395	32.0	4	135.0	2295	11.6	82	1
396	28.0	4	120.0	2625	18.6	82	1
397	31.0	4	119.0	2720	19.4	82	1

398 rows × 7 columns

In [ ]:
```python
model_year_count = df['model year'].drop_duplicates().count()
origin_count = df['origin'].drop_duplicates().count()
model_year_count, origin_count
```

Out[ ]: (13, 3)

In [ ]:
```python
grpby_model_year = df.groupby('model year').count()
grpby_model_year
```

Out[ ]:

model year	mpg	cylinders	displacement	weight	acceleration	origin
70	29	29	29	29	29	29
71	28	28	28	28	28	28
72	28	28	28	28	28	28
73	40	40	40	40	40	40
74	27	27	27	27	27	27
75	30	30	30	30	30	30
76	34	34	34	34	34	34
77	28	28	28	28	28	28
78	36	36	36	36	36	36
79	29	29	29	29	29	29
80	29	29	29	29	29	29
81	29	29	29	29	29	29
82	31	31	31	31	31	31

Matplotlib Library

In [ ]:
```python
plt.figure(figsize=(6,6))
plt.hist(grpby_model_year)
plt.show()
```
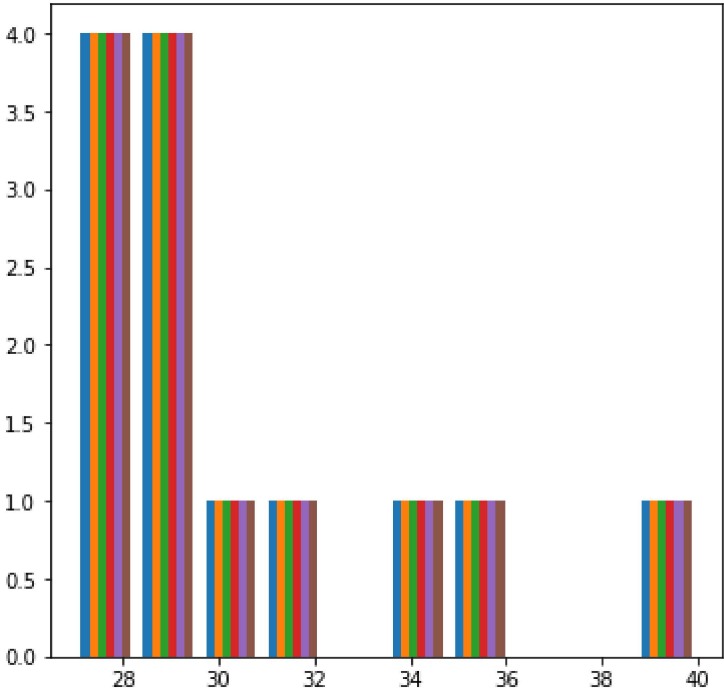

In [ ]:
```python
def plot_hist(data, features):
    len_features = len(features)
    plt.figure(figsize=(10,8))
```

```
    for i, feature in enumerate(features):
        plt.subplot(2, 2, i+1)
        plt.hist(data = df, x = feature, bins = 20, color = 'grey', edgecolor = 'white')
        plt.title(f"Histplot of {feature}")
        plt.xlabel(feature)
        plt.ylabel("frequency")
    plt.tight_layout()
    plt.show()

features = ['displacement', 'weight', 'acceleration', 'mpg']
plot_hist(df, features)
```
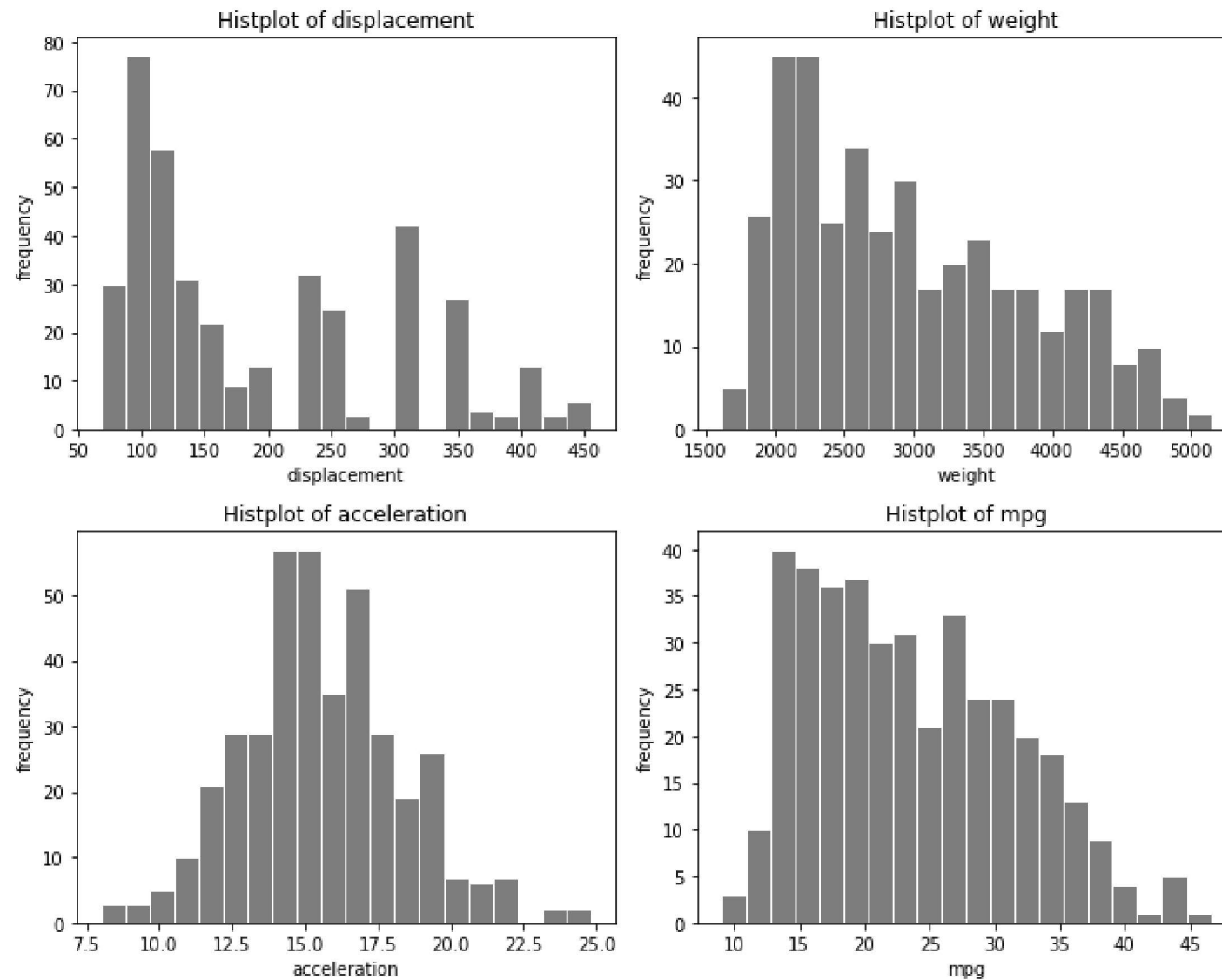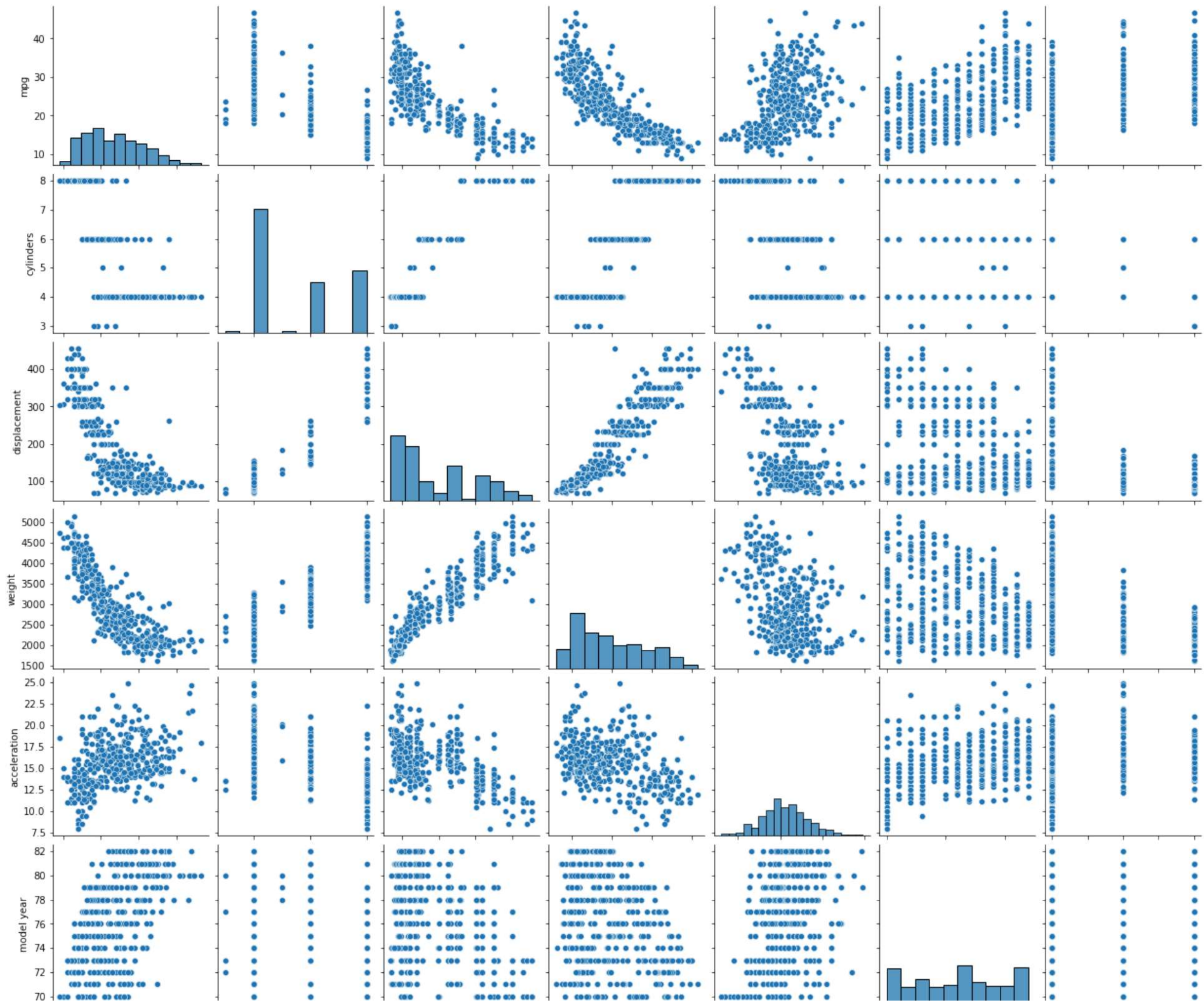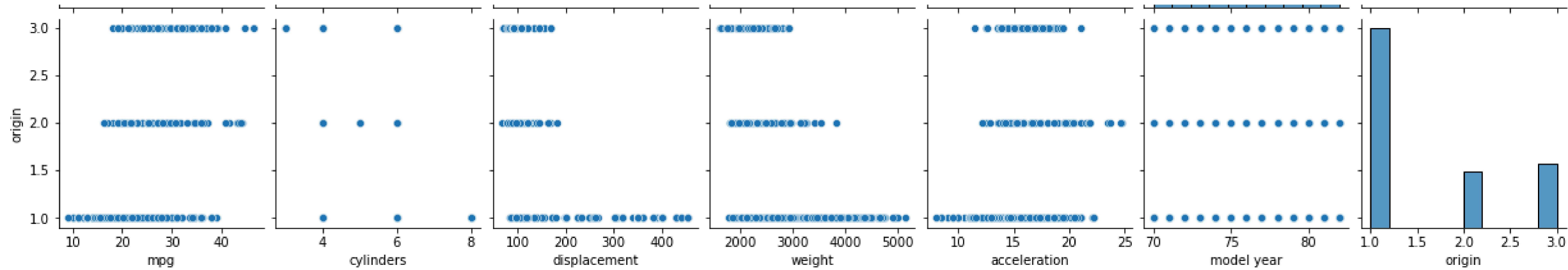

Seaborn Library

```
In [ ]:  sb.pairplot(df)
         plt.show()
```
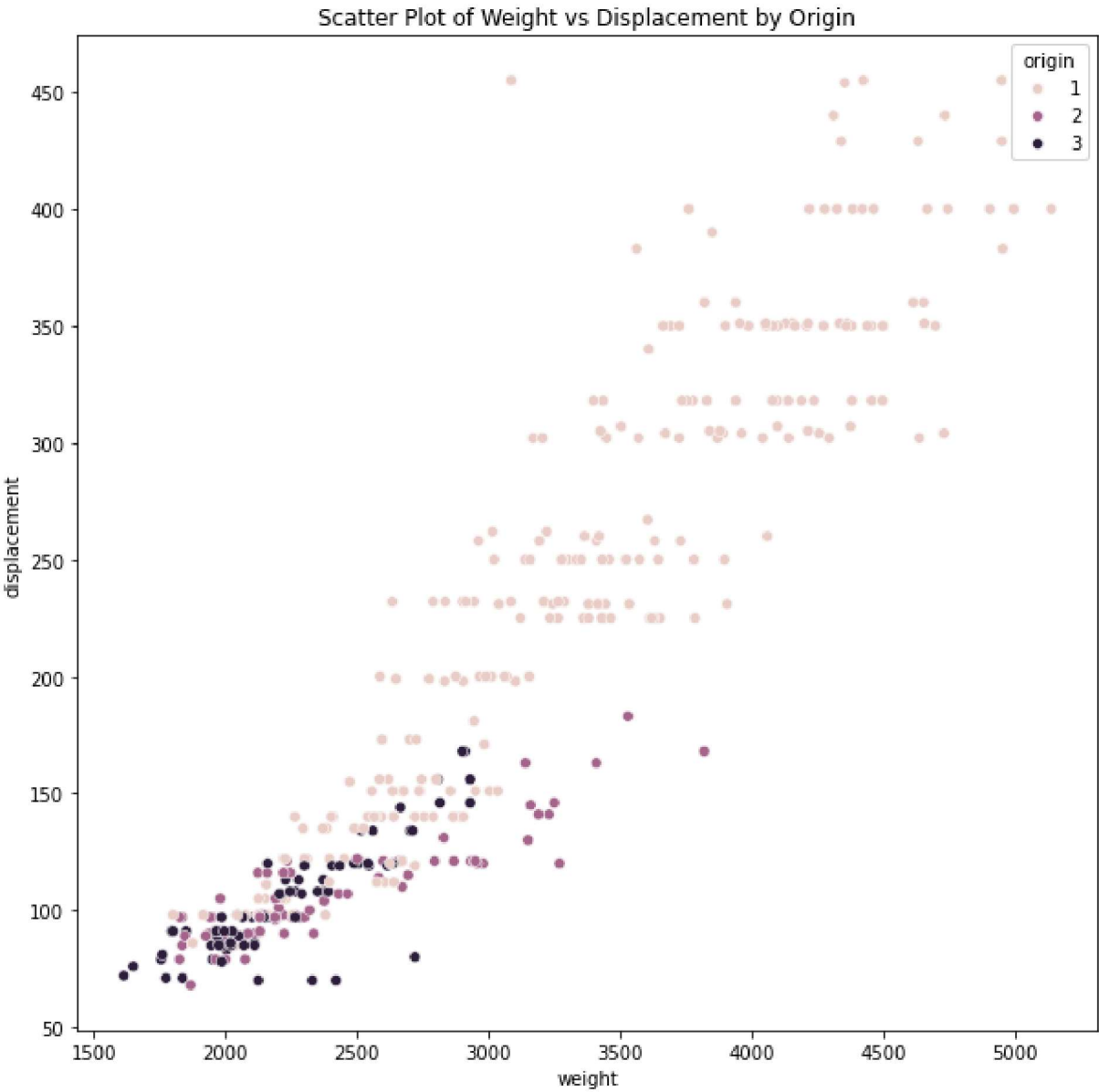
```
In [ ]:  plt.figure(figsize=(10,10))
         sb.scatterplot(x='weight', y='displacement', hue='origin', data=df)
         plt.title('Scatter Plot of Weight vs Displacement by Origin')
         plt.xlabel('weight')
         plt.ylabel('displacement')
         plt.show()
```
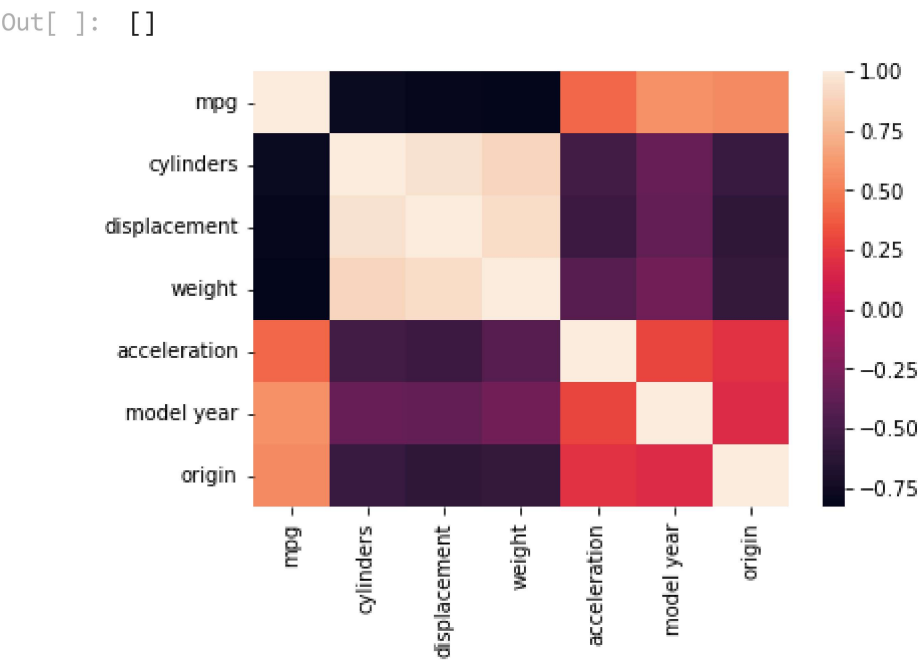


```
In [ ]:  corr = df.corr()
         corr
```

Out[ ]:

	mpg	cylinders	displacement	weight	acceleration	model year	origin
mpg	1.000000	-0.775396	-0.804203	-0.831741	0.420289	0.579267	0.563450
cylinders	-0.775396	1.000000	0.950721	0.896017	-0.505419	-0.348746	-0.562543
displacement	-0.804203	0.950721	1.000000	0.932824	-0.543684	-0.370164	-0.609409
weight	-0.831741	0.896017	0.932824	1.000000	-0.417457	-0.306564	-0.581024
acceleration	0.420289	-0.505419	-0.543684	-0.417457	1.000000	0.288137	0.205873
model year	0.579267	-0.348746	-0.370164	-0.306564	0.288137	1.000000	0.180662
origin	0.563450	-0.562543	-0.609409	-0.581024	0.205873	0.180662	1.000000

In [ ]:
```
sb.heatmap(corr)
plt.plot()
```

Out[ ]: []

In [ ]: