The data of different cars is given with their specifications.

This data is available as a CSV file. We are going to analyze this data set using the Pandas DataFrame.

In [1]:
```
import pandas as pd
```

In [2]:
```
data=pd.read_csv(r"C:\Users\KIIT\Downloads\archive (1)\Automobile.csv")
```

In [3]:
```
data
```

Out[3]:

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
0	chevrolet chevelle malibu	18.0	8	307.0	130.0	3504	12.0	70	usa
1	buick skylark 320	15.0	8	350.0	165.0	3693	11.5	70	usa
2	plymouth satellite	18.0	8	318.0	150.0	3436	11.0	70	usa
3	amc rebel sst	16.0	8	304.0	150.0	3433	12.0	70	usa
4	ford torino	17.0	8	302.0	140.0	3449	10.5	70	usa
...	...	...	...	...	...	...	...	...	...
393	ford mustang gl	27.0	4	140.0	86.0	2790	15.6	82	usa
394	vw pickup	44.0	4	97.0	52.0	2130	24.6	82	europe
395	dodge rampage	32.0	4	135.0	84.0	2295	11.6	82	usa
396	ford ranger	28.0	4	120.0	79.0	2625	18.6	82	usa
397	chevy s-10	31.0	4	119.0	82.0	2720	19.4	82	usa

398 rows × 9 columns

In [5]:
```
data.head(20)
```

Out[5]:

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
0	chevrolet chevelle malibu	18.0	8	307.0	130.0	3504	12.0	70	usa
1	buick skylark 320	15.0	8	350.0	165.0	3693	11.5	70	usa
2	plymouth satellite	18.0	8	318.0	150.0	3436	11.0	70	usa
3	amc rebel sst	16.0	8	304.0	150.0	3433	12.0	70	usa
4	ford torino	17.0	8	302.0	140.0	3449	10.5	70	usa
5	ford galaxie 500	15.0	8	429.0	198.0	4341	10.0	70	usa
6	chevrolet impala	14.0	8	454.0	220.0	4354	9.0	70	usa
7	plymouth fury iii	14.0	8	440.0	215.0	4312	8.5	70	usa
8	pontiac catalina	14.0	8	455.0	225.0	4425	10.0	70	usa
9	amc ambassador dpl	15.0	8	390.0	190.0	3850	8.5	70	usa
10	dodge challenger se	15.0	8	383.0	170.0	3563	10.0	70	usa
11	plymouth 'cuda 340	14.0	8	340.0	160.0	3609	8.0	70	usa
12	chevrolet monte carlo	15.0	8	400.0	150.0	3761	9.5	70	usa
13	buick estate wagon (sw)	14.0	8	455.0	225.0	3086	10.0	70	usa
14	toyota corona mark ii	24.0	4	113.0	95.0	2372	15.0	70	japan
15	plymouth duster	22.0	6	198.0	95.0	2833	15.5	70	usa
16	amc hornet	18.0	6	199.0	97.0	2774	15.5	70	usa
17	ford maverick	21.0	6	200.0	85.0	2587	16.0	70	usa
18	datsun pl510	27.0	4	97.0	88.0	2130	14.5	70	japan
19	volkswagen 1131 deluxe sedan	26.0	4	97.0	46.0	1835	20.5	70	europe

In [9]:
```
data.shape
```

Out[9]: (398, 9)

In [7]:
```
data.isnull().sum()
```

Out[7]:
```
name            0
mpg             0
cylinders       0
displacement    0
horsepower      6
weight          0
acceleration    0
model_year      0
origin          0
dtype: int64
```

Show all car company

In [8]:
```
data['name'].value_counts()
```

Out[8]:
```
ford pinto             6
toyota corolla         5
amc matador            5
ford maverick          5
chevrolet chevette     4
                      ..
chevrolet monza 2+2    1
ford mustang ii        1
pontiac astro          1
amc pacer              1
chevy s-10             1
Name: name, Length: 305, dtype: int64
```

Maximum Horsepower

In [10]:
```
data['horsepower'].max()
```

Out[10]:
```
230.0
```

Minimum Displacement

In [11]:
```
data['displacement'].min()
```

Out[11]:
```
68.0
```

Mean Weight

In [12]:
```
data['weight'].mean()
```

Out[12]:
```
2970.424623115578
```

Fastest acceleration

In [17]:
```
data['acceleration'].min()
```

Out[17]:
```
8.0
```

In [21]:
```
data[data['acceleration'].isin([8])]
```

Out[21]:

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
11	plymouth 'cuda 340	14.0	8	340.0	160.0	3609	8.0	70	usa

Number of cars in the different years

In [18]:
```
data['model_year'].value_counts()
```

Out[18]:
```
73    40
78    36
76    34
82    31
75    30
70    29
79    29
80    29
81    29
71    28
72    28
77    28
74    27
Name: model_year, dtype: int64
```

Number of cars from different origins

In [19]:
```
data['origin'].value_counts()
```

Out[19]:
```
usa       249
japan      79
europe     70
Name: origin, dtype: int64
```

Show cars having only japan and europes as it's origin

In [20]:
```
data[data['origin'].isin(['japan', 'europe'])]
```

Out[20]:

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
14	toyota corona mark ii	24.0	4	113.0	95.0	2372	15.0	70	japan
18	datsun pl510	27.0	4	97.0	88.0	2130	14.5	70	japan
19	volkswagen 1131 deluxe sedan	26.0	4	97.0	46.0	1835	20.5	70	europe
20	peugeot 504	25.0	4	110.0	87.0	2672	17.5	70	europe
21	audi 100 ls	24.0	4	107.0	90.0	2430	14.5	70	europe
...	...	...	...	...	...	...	...	...	...
383	honda civic	38.0	4	91.0	67.0	1965	15.0	82	japan
384	honda civic (auto)	32.0	4	91.0	67.0	1965	15.7	82	japan
385	datsun 310 gx	38.0	4	91.0	67.0	1995	16.2	82	japan
390	toyota celica gt	32.0	4	144.0	96.0	2665	13.9	82	japan
394	vw pickup	44.0	4	97.0	52.0	2130	24.6	82	europe

149 rows × 9 columns

Remove all data having weight more than 4000

In [22]:
```
data[~(data['weight'] > 4000)]
```

Out[22]:

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
0	chevrolet chevelle malibu	18.0	8	307.0	130.0	3504	12.0	70	usa
1	buick skylark 320	15.0	8	350.0	165.0	3693	11.5	70	usa
2	plymouth satellite	18.0	8	318.0	150.0	3436	11.0	70	usa
3	amc rebel sst	16.0	8	304.0	150.0	3433	12.0	70	usa
4	ford torino	17.0	8	302.0	140.0	3449	10.5	70	usa
...	...	...	...	...	...	...	...	...	...
393	ford mustang gl	27.0	4	140.0	86.0	2790	15.6	82	usa
394	vw pickup	44.0	4	97.0	52.0	2130	24.6	82	europe
395	dodge rampage	32.0	4	135.0	84.0	2295	11.6	82	usa
396	ford ranger	28.0	4	120.0	79.0	2625	18.6	82	usa
397	chevy s-10	31.0	4	119.0	82.0	2720	19.4	82	usa

334 rows × 9 columns

Increase all mpg values by 3

In [23]:
```
data['mpg'] =  data['mpg'].apply(lambda x:x+3)
```

In [24]:
```
data
```

Out[24]:

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
0	chevrolet chevelle malibu	21.0	8	307.0	130.0	3504	12.0	70	usa
1	buick skylark 320	18.0	8	350.0	165.0	3693	11.5	70	usa
2	plymouth satellite	21.0	8	318.0	150.0	3436	11.0	70	usa
3	amc rebel sst	19.0	8	304.0	150.0	3433	12.0	70	usa
4	ford torino	20.0	8	302.0	140.0	3449	10.5	70	usa
...	...	...	...	...	...	...	...	...	...
393	ford mustang gl	30.0	4	140.0	86.0	2790	15.6	82	usa
394	vw pickup	47.0	4	97.0	52.0	2130	24.6	82	europe
395	dodge rampage	35.0	4	135.0	84.0	2295	11.6	82	usa
396	ford ranger	31.0	4	120.0	79.0	2625	18.6	82	usa
397	chevy s-10	34.0	4	119.0	82.0	2720	19.4	82	usa

398 rows × 9 columns

Minimum and Maximum values groupby Origin

Minimum

In [25]:
```
data.groupby('origin').min()
```

Out[25]:

origin	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year
europe	audi 100 ls	19.2	4	68.0	46.0	1825	12.2	70
japan	datsun 1200	21.0	3	70.0	52.0	1613	11.4	70
usa	amc ambassador brougham	12.0	4	85.0	52.0	1800	8.0	70

Maximum

In [26]:
```
data.groupby('origin').max()
```

Out[26]:

origin	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year
europe	vw rabbit custom	47.3	6	183.0	133.0	3820	24.8	82
japan	toyouta corona mark ii (sw)	49.6	6	168.0	132.0	2930	21.0	82
usa	pontiac ventura sj	42.0	8	455.0	230.0	5140	22.2	82

Cars with horsepower more than 3500 or acceleration less than 10 and weight more than 2500

In [27]:
```
data[(data['horsepower'] > 3500) & (data['acceleration'] < 10)|(data['weight'] > 250
```

Out[27]:

	name	mpg	cylinders	displacement	horsepower	weight	acceleration	model_year	origin
0	chevrolet chevelle malibu	21.0	8	307.0	130.0	3504	12.0	70	usa
1	buick skylark 320	18.0	8	350.0	165.0	3693	11.5	70	usa
2	plymouth satellite	21.0	8	318.0	150.0	3436	11.0	70	usa
3	amc rebel sst	19.0	8	304.0	150.0	3433	12.0	70	usa
4	ford torino	20.0	8	302.0	140.0	3449	10.5	70	usa
...	...	...	...	...	...	...	...	...	...
390	toyota celica gt	35.0	4	144.0	96.0	2665	13.9	82	japan
392	chevrolet camaro	30.0	4	151.0	90.0	2950	17.3	82	usa
393	ford mustang gl	30.0	4	140.0	86.0	2790	15.6	82	usa
396	ford ranger	31.0	4	120.0	79.0	2625	18.6	82	usa
397	chevy s-10	34.0	4	119.0	82.0	2720	19.4	82	usa

251 rows × 9 columns

In [ ]:
```

```