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

In [2]:
```
car=pd.read_csv(r"E:\new download\2. Cars Data1.csv")
```

In [3]:
```
car.head(3)
```

Out[3]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	M
0	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6.0	265.0	17.0	
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200.0	24.0	
2	Acura	TSX 4dr	Sedan	Asia	Front	$26,990	$24,647	2.4	4.0	200.0	22.0	

In [4]:
```
car.shape
```

Out[4]:
```
(432, 15)
```

Q.1) Data cleaning

Find null value and replace it with mean of the column

In [6]:
```
car.isnull().sum()
```

Out[6]:
```
Make          4
Model         4
Type          4
Origin        4
DriveTrain    4
MSRP          4
Invoice       4
EngineSize    4
Cylinders     6
Horsepower    4
MPG_City      4
MPG_Highway   4
Weight        4
Wheelbase     4
Length        4
dtype: int64
```

In [26]:
```
car['Cylinders'].fillna(car['Cylinders'].mean(), inplace=True)
```

In [24]:
```
car.isnull().sum()
```

Out[24]:
```
Make           4
Model          4
Type           4
Origin         4
DriveTrain     4
MSRP           4
Invoice        4
EngineSize     0
Cylinders      0
Horsepower     4
MPG_City       4
MPG_Highway    4
Weight         4
Wheelbase      4
Length         4
dtype: int64
```

In [22]:
```
car.dtypes
```

Out[22]:
```
Make            object
Model           object
Type            object
Origin          object
DriveTrain      object
MSRP            object
Invoice         object
EngineSize     float64
Cylinders      float64
Horsepower     float64
MPG_City       float64
MPG_Highway    float64
Weight         float64
Wheelbase      float64
Length         float64
dtype: object
```

In [23]:
```
car['EngineSize'].fillna(car['EngineSize'].mean(), inplace=True)
```

In [27]:
```
car['Horsepower'].fillna(car['Horsepower'].mean(), inplace=True)
```

In [28]:
```
car.isnull().sum()
```

Out[28]:
```
Make           4
Model          4
Type           4
Origin         4
DriveTrain     4
MSRP           4
Invoice        4
EngineSize     0
Cylinders      0
Horsepower     0
MPG_City       4
MPG_Highway    4
Weight         4
Wheelbase      4
Length         4
dtype: int64
```

Q.2) Check what are the different types of 'make' are there in our dataset and what is the

count(occurance) of each 'Make' in the data?

In [31]:
```
car['Make'].value_counts()
```

Out[31]:
```
Toyota           28
Chevrolet        27
Mercedes-Benz    26
Ford             23
BMW              20
Audi             19
Honda            17
Nissan           17
Volkswagen       15
Chrysler         15
Dodge            13
Mitsubishi       13
Volvo            12
Jaguar           12
Hyundai          12
Subaru           11
Pontiac          11
Mazda            11
Lexus            11
Kia              11
Buick             9
Mercury           9
Lincoln           9
Saturn            8
Cadillac          8
Suzuki            8
Infiniti          8
GMC               8
Acura             7
Porsche           7
Saab              7
Land Rover        3
Oldsmobile        3
Jeep              3
Scion             2
Isuzu             2
MINI              2
Hummer            1
Name: Make, dtype: int64
```

Q.3) Show all the records where origin is Asia or Europe.

In [34]:
```
car.head(20)
```

Out[34]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_
0	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6.0	265.0	
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200.0	
2	Acura	TSX 4dr	Sedan	Asia	Front	$26,990	$24,647	2.4	4.0	200.0	
3	Acura	TL 4dr	Sedan	Asia	Front	$33,195	$30,299	3.2	6.0	270.0	
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	$43,755	$39,014	3.5	6.0	225.0	
5	Acura	3.5 RL w/Navigation 4dr	Sedan	Asia	Front	$46,100	$41,100	3.5	6.0	225.0	
6	Acura	NSX coupe 2dr manual S	Sports	Asia	Rear	$89,765	$79,978	3.2	6.0	290.0	
7	Audi	A4 1.8T 4dr	Sedan	Europe	Front	$25,940	$23,508	1.8	4.0	170.0	
8	Audi	A41.8T convertible 2dr	Sedan	Europe	Front	$35,940	$32,506	1.8	4.0	170.0	
9	Audi	A4 3.0 4dr	Sedan	Europe	Front	$31,840	$28,846	3.0	6.0	220.0	
10	Audi	A4 3.0 Quattro 4dr manual	Sedan	Europe	All	$33,430	$30,366	3.0	6.0	220.0	
11	Audi	A4 3.0 Quattro 4dr auto	Sedan	Europe	All	$34,480	$31,388	3.0	6.0	220.0	
12	Audi	A6 3.0 4dr	Sedan	Europe	Front	$36,640	$33,129	3.0	6.0	220.0	
13	Audi	A6 3.0 Quattro 4dr	Sedan	Europe	All	$39,640	$35,992	3.0	6.0	220.0	
14	Audi	A4 3.0 convertible 2dr	Sedan	Europe	Front	$42,490	$38,325	3.0	6.0	220.0	
15	Audi	A4 3.0 Quattro convertible 2dr	Sedan	Europe	All	$44,240	$40,075	3.0	6.0	220.0	
16	Audi	A6 2.7 Turbo Quattro 4dr	Sedan	Europe	All	$42,840	$38,840	2.7	6.0	250.0	
17	Audi	A6 4.2 Quattro 4dr	Sedan	Europe	All	$49,690	$44,936	4.2	8.0	300.0	
18	Audi	A8 L Quattro 4dr	Sedan	Europe	All	$69,190	$64,740	4.2	8.0	330.0	
19	Audi	S4 Quattro 4dr	Sedan	Europe	All	$48,040	$43,556	4.2	8.0	340.0	

In [35]:
```
car[(car['Origin']=='Asia') | (car['Origin']=='Europe')]
```

Out[35]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_
0	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6.0	265.0	
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200.0	
2	Acura	TSX 4dr	Sedan	Asia	Front	$26,990	$24,647	2.4	4.0	200.0	
3	Acura	TL 4dr	Sedan	Asia	Front	$33,195	$30,299	3.2	6.0	270.0	
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	$43,755	$39,014	3.5	6.0	225.0	
...	...	...	...	...	...	...	...	...	...	...	
427	Volvo	C70 LPT convertible 2dr	Sedan	Europe	Front	$40,565	$38,203	2.4	5.0	197.0	
428	Volvo	C70 HPT convertible 2dr	Sedan	Europe	Front	$42,565	$40,083	2.3	5.0	242.0	
429	Volvo	S80 T6 4dr	Sedan	Europe	Front	$45,210	$42,573	2.9	6.0	268.0	
430	Volvo	V40	Wagon	Europe	Front	$26,135	$24,641	1.9	4.0	170.0	
431	Volvo	XC70	Wagon	Europe	All	$35,145	$33,112	2.5	5.0	208.0	

281 rows × 15 columns

Q.4) Remove the all records(rows) where weight is above 4000.

In [39]:
```
car[~(car['Weight']>4000)]
```

Out[39]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MP(
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200.0	
2	Acura	TSX 4dr	Sedan	Asia	Front	$26,990	$24,647	2.4	4.0	200.0	
3	Acura	TL 4dr	Sedan	Asia	Front	$33,195	$30,299	3.2	6.0	270.0	
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	$43,755	$39,014	3.5	6.0	225.0	
5	Acura	3.5 RL w/Navigation 4dr	Sedan	Asia	Front	$46,100	$41,100	3.5	6.0	225.0	
...	...	...	...	...	...	...	...	...	...	...	
427	Volvo	C70 LPT convertible 2dr	Sedan	Europe	Front	$40,565	$38,203	2.4	5.0	197.0	
428	Volvo	C70 HPT convertible 2dr	Sedan	Europe	Front	$42,565	$40,083	2.3	5.0	242.0	
429	Volvo	S80 T6 4dr	Sedan	Europe	Front	$45,210	$42,573	2.9	6.0	268.0	
430	Volvo	V40	Wagon	Europe	Front	$26,135	$24,641	1.9	4.0	170.0	
431	Volvo	XC70	Wagon	Europe	All	$35,145	$33,112	2.5	5.0	208.0	

329 rows × 15 columns

In [40]:
```
car.shape
```

Out[40]:
```
(432, 15)
```

Q.5) Increase all the values of 'MPG_City' column by 3.

In [41]:
```
car['MPG_City']= car['MPG_City'].apply(lambda x:x+3)
```

In [42]:
```
car.head()
```

Out[42]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	M
0	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6.0	265.0	20.0	
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200.0	27.0	
2	Acura	TSX 4dr	Sedan	Asia	Front	$26,990	$24,647	2.4	4.0	200.0	25.0	
3	Acura	TL 4dr	Sedan	Asia	Front	$33,195	$30,299	3.2	6.0	270.0	23.0	
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	$43,755	$39,014	3.5	6.0	225.0	21.0	

In [ ]:
```

```