Cars Dataset

Here, The data of different cars is given with their specifications.

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

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

In [8]:
```
car = pd.read_csv(r"C:\Users\hp\Downloads\file.csv")
```

In [9]:
```
car.head()
```

Out[9]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	Length
0	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6.0	265	17	23	4451	106	189
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200	24	31	2778	101	172
2	Acura	TSX 4dr	Sedan	Asia	Front	$26,990	$24,647	2.4	4.0	200	22	29	3230	105	183
3	Acura	TL 4dr	Sedan	Asia	Front	$33,195	$30,299	3.2	6.0	270	20	28	3575	108	186
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	$43,755	$39,014	3.5	6.0	225	18	24	3880	115	197

In [10]:
```
car.shape
```

Out[10]:
```
(428, 15)
```

1) Instruction (for Data Cleaning)

- Find all the Null Value in the dataset, if there is any null value in any cloumn then fit it with the mean of that column.

In [11]:
```
car.isnull().sum()
```

Out[11]:
```
Make          0
Model         0
Type          0
Origin        0
DriveTrain    0
MSRP          0
Invoice       0
EngineSize    0
Cylinders     2
Horsepower    0
MPG_City      0
MPG_Highway   0
Weight        0
Wheelbase     0
Length        0
dtype: int64
```

In [13]:
```
car["Cylinders"].fillna(car["Cylinders"].mean(), inplace= True)
```

In [14]:
```
car.isnull().sum()
```

Out[14]:
```
Make          0
Model         0
Type          0
Origin        0
DriveTrain    0
MSRP          0
Invoice       0
EngineSize    0
Cylinders     0
Horsepower    0
MPG_City      0
MPG_Highway   0
Weight        0
Wheelbase     0
Length        0
dtype: int64
```

2) Question (Based on Value Counts)

- Check what are the different type of Make are there in our dataset. And what is the count (occurance) of each Make in the data ?

In [15]:
```
car.head(5)
```

Out[15]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	Length
0	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6.0	265	17	23	4451	106	189
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200	24	31	2778	101	172
2	Acura	TSX 4dr	Sedan	Asia	Front	$26,990	$24,647	2.4	4.0	200	22	29	3230	105	183
3	Acura	TL 4dr	Sedan	Asia	Front	$33,195	$30,299	3.2	6.0	270	20	28	3575	108	186
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	$43,755	$39,014	3.5	6.0	225	18	24	3880	115	197

In [16]:
```
car["Make"].value_counts()
```

Out[16]:
```
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
```

3) Instruction (Filtering)

- Show all the records where origin is Asia or Europe.

In [17]:
```
car.head(2)
```

Out[17]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	Length
0	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6.0	265	17	23	4451	106	189
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200	24	31	2778	101	172

In [18]:
```
car[car["Origin"].isin(["Asia" , "Europe"])]
```

Out[18]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	Length
0	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6.0	265	17	23	4451	106	189
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200	24	31	2778	101	172
2	Acura	TSX 4dr	Sedan	Asia	Front	$26,990	$24,647	2.4	4.0	200	22	29	3230	105	183
3	Acura	TL 4dr	Sedan	Asia	Front	$33,195	$30,299	3.2	6.0	270	20	28	3575	108	186
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	$43,755	$39,014	3.5	6.0	225	18	24	3880	115	197
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
423	Volvo	C70 LPT convertible 2dr	Sedan	Europe	Front	$40,565	$38,203	2.4	5.0	197	21	28	3450	105	186
424	Volvo	C70 HPT convertible 2dr	Sedan	Europe	Front	$42,565	$40,083	2.3	5.0	242	20	26	3450	105	186
425	Volvo	S80 T6 4dr	Sedan	Europe	Front	$45,210	$42,573	2.9	6.0	268	19	26	3653	110	190
426	Volvo	V40	Wagon	Europe	Front	$26,135	$24,641	1.9	4.0	170	22	29	2822	101	180
427	Volvo	XC70	Wagon	Europe	All	$35,145	$33,112	2.5	5.0	208	20	27	3823	109	186

281 rows × 15 columns

4) Instruction (Removing Unwanted records)

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

In [19]:
```
car.head(5)
```

Out[19]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	Length
0	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6.0	265	17	23	4451	106	189
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200	24	31	2778	101	172
2	Acura	TSX 4dr	Sedan	Asia	Front	$26,990	$24,647	2.4	4.0	200	22	29	3230	105	183
3	Acura	TL 4dr	Sedan	Asia	Front	$33,195	$30,299	3.2	6.0	270	20	28	3575	108	186
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	$43,755	$39,014	3.5	6.0	225	18	24	3880	115	197

In [20]:
```
car[car['Weight'] > 4000]
```

Out[20]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	Length
0	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6.0	265	17	23	4451	106	189
15	Audi	A4 3.0 Quattro convertible 2dr	Sedan	Europe	All	$44,240	$40,075	3.0	6.0	220	18	25	4013	105	180
17	Audi	A6 4.2 Quattro 4dr	Sedan	Europe	All	$49,690	$44,936	4.2	8.0	300	17	24	4024	109	193
18	Audi	A8 L Quattro 4dr	Sedan	Europe	All	$69,190	$64,740	4.2	8.0	330	17	24	4399	121	204
20	Audi	RS 6 4dr	Sports	Europe	Front	$84,600	$76,417	4.2	8.0	450	15	22	4024	109	191
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
401	Volkswagen	Touareg V6	SUV	Europe	All	$35,515	$32,243	3.2	6.0	220	15	20	5086	112	187
411	Volkswagen	Phaeton 4dr	Sedan	Europe	Front	$65,000	$59,912	4.2	8.0	335	16	22	5194	118	204
412	Volkswagen	Phaeton W12 4dr	Sedan	Europe	Front	$75,000	$69,130	6.0	12.0	420	12	19	5399	118	204
415	Volkswagen	Passat W8	Wagon	Europe	Front	$40,235	$36,956	4.0	8.0	270	18	25	4067	106	184
416	Volvo	XC90 T6	SUV	Europe	All	$41,250	$38,851	2.9	6.0	268	15	20	4638	113	189

103 rows × 15 columns

In [21]:
```
car[~(car["Weight"] > 4000)]
```

Out[21]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	Length
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200	24	31	2778	101	172
2	Acura	TSX 4dr	Sedan	Asia	Front	$26,990	$24,647	2.4	4.0	200	22	29	3230	105	183
3	Acura	TL 4dr	Sedan	Asia	Front	$33,195	$30,299	3.2	6.0	270	20	28	3575	108	186
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	$43,755	$39,014	3.5	6.0	225	18	24	3880	115	197
5	Acura	3.5 RL w/Navigation 4dr	Sedan	Asia	Front	$46,100	$41,100	3.5	6.0	225	18	24	3893	115	197
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
423	Volvo	C70 LPT convertible 2dr	Sedan	Europe	Front	$40,565	$38,203	2.4	5.0	197	21	28	3450	105	186
424	Volvo	C70 HPT convertible 2dr	Sedan	Europe	Front	$42,565	$40,083	2.3	5.0	242	20	26	3450	105	186
425	Volvo	S80 T6 4dr	Sedan	Europe	Front	$45,210	$42,573	2.9	6.0	268	19	26	3653	110	190
426	Volvo	V40	Wagon	Europe	Front	$26,135	$24,641	1.9	4.0	170	22	29	2822	101	180
427	Volvo	XC70	Wagon	Europe	All	$35,145	$33,112	2.5	5.0	208	20	27	3823	109	186

325 rows × 15 columns

5) Instruction (Applying Fuction on a column)

- Increase all the value of 'MPG_City' column by 3.

In [23]:
```
car.head(2)
```

Out[23]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	Length
0	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6.0	265	17	23	4451	106	189
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200	24	31	2778	101	172

In [24]:
```
car["MPG_City"] = car["MPG_City"].apply(lambda x: x+3)
```

In [26]:
```
car.head(10)
```

Out[26]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	Length
0	Acura	MDX	SUV	Asia	All	$36,945	$33,337	3.5	6.0	265	20	23	4451	106	189
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	$23,820	$21,761	2.0	4.0	200	27	31	2778	101	172
2	Acura	TSX 4dr	Sedan	Asia	Front	$26,990	$24,647	2.4	4.0	200	25	29	3230	105	183
3	Acura	TL 4dr	Sedan	Asia	Front	$33,195	$30,299	3.2	6.0	270	23	28	3575	108	186
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	$43,755	$39,014	3.5	6.0	225	21	24	3880	115	197
5	Acura	3.5 RL w/Navigation 4dr	Sedan	Asia	Front	$46,100	$41,100	3.5	6.0	225	21	24	3893	115	197
6	Acura	NSX coupe 2dr manual S	Sports	Asia	Rear	$89,765	$79,978	3.2	6.0	290	20	24	3153	100	174
7	Audi	A4 1.8T 4dr	Sedan	Europe	Front	$25,940	$23,508	1.8	4.0	170	25	31	3252	104	179
8	Audi	A41.8T convertible 2dr	Sedan	Europe	Front	$35,940	$32,506	1.8	4.0	170	26	30	3638	105	180
9	Audi	A4 3.0 4dr	Sedan	Europe	Front	$31,840	$28,846	3.0	6.0	220	23	28	3462	104	179

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