

Cars Dataset

The data of different cars is given with their specifications. I'm going to analyze this dataset using the Pandas DataFrame

```
In [63]: import pandas as pd

In [37]: car=pd.read_csv(r"C:\Users\Sathiyamurthy\Downloads\2. Cars Data1.csv")

In [38]: car.head()

Out[38]:
```

	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 [39]: car.shape

Out[39]: (428, 15)
```

i) Data Cleaning

Find all null value in the datasets.If there is null then fill with the mean of that columnn.

```
In [49]: car.isnull().sum()

Out[49]:
```

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

```
In [50]: car['Cylinders'].fillna(car['Cylinders'].mean(),inplace=True)
```

ii) Value counts

check what are the different types of make are there in our dataset.And,what is the count of each Make in the data

```
In [51]: car["Make"].value_counts()

Out[51]:
```

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

iii)Instruction(Filtering)

Show all the records where Origin is Asia or Europe.

```
In [53]: car[car['Origin'].isin(['Asia','Europe'])]

Out[53]:
```

	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	18
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	\$23,820	\$21,761	2.0	4.0	200	24	31	2778	101	17
2	Acura	TSX 4dr	Sedan	Asia	Front	\$26,990	\$24,647	2.4	4.0	200	22	29	3230	105	18
3	Acura	TL 4dr	Sedan	Asia	Front	\$33,195	\$30,299	3.2	6.0	270	20	28	3575	108	18
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	\$43,755	\$39,014	3.5	6.0	225	18	24	3880	115	19
...
423	Volvo	C70 LPT convertible 2dr	Sedan	Europe	Front	\$40,565	\$38,203	2.4	5.0	197	21	28	3450	105	18
424	Volvo	C70 HPT convertible 2dr	Sedan	Europe	Front	\$42,565	\$40,083	2.3	5.0	242	20	26	3450	105	18
425	Volvo	S80 T6 4dr	Sedan	Europe	Front	\$45,210	\$42,573	2.9	6.0	268	19	26	3653	110	19
426	Volvo	V40	Wagon	Europe	Front	\$26,135	\$24,641	1.9	4.0	170	22	29	2822	101	18
427	Volvo	XC70	Wagon	Europe	All	\$35,145	\$33,112	2.5	5.0	208	20	27	3823	109	18

281 rows × 15 columns

iv)Removing unwanted records

Remove all the records where Weight is above 4000

```
In [54]: car[car['Weight']>4000]

Out[54]:
```

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	
0	Acura	MDX	SUV	Asia	All	\$36,945	\$33,337	3.5	6.0	265	17	23	4451	106	
15	Audi	A4 3.0 Quattro convertible 2dr	Sedan	Europe	All	\$44,240	\$40,075	3.0	6.0	220	18	25	4013	105	
17	Audi	A6 4.2 Quattro 4dr	Sedan	Europe	All	\$49,690	\$44,936	4.2	8.0	300	17	24	4024	109	
18	Audi	A8 L Quattro 4dr	Sedan	Europe	All	\$69,190	\$64,740	4.2	8.0	330	17	24	4399	121	
20	Audi	RS 6 4dr	Sports	Europe	Front	\$84,600	\$76,417	4.2	8.0	450	15	22	4024	109	
...
401	Volkswagen	Touareg V6	SUV	Europe	All	\$35,515	\$32,243	3.2	6.0	220	15	20	5086	112	
411	Volkswagen	Phaeton 4dr	Sedan	Europe	Front	\$65,000	\$59,912	4.2	8.0	335	16	22	5194	118	
412	Volkswagen	Phaeton W12 4dr	Sedan	Europe	Front	\$75,000	\$69,130	6.0	12.0	420	12	19	5399	118	
415	Volkswagen	Passat V8	Wagon	Europe	Front	\$40,235	\$36,956	4.0	8.0	270	18	25	4067	106	
416	Volvo	XC90 T6	SUV	Europe	All	\$41,250	\$38,851	2.9	6.0	268	15	20	4638	113	

103 rows × 15 columns

```
In [57]: car[~(car['Weight']>4000)]

Out[57]:
```

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	Len
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	18
424	Volvo	C70 HPT convertible 2dr	Sedan	Europe	Front	\$42,565	\$40,083	2.3	5.0	242	20	26	3450	105	18
425	Volvo	S80 T6 4dr	Sedan	Europe	Front	\$45,210	\$42,573	2.9	6.0	268	19	26	3653	110	19
426	Volvo	V40	Wagon	Europe	Front	\$26,135	\$24,641	1.9	4.0	170	22	29	2822	101	18
427	Volvo	XC70	Wagon	Europe	All	\$35,145	\$33,112	2.5	5.0	208	20	27	3823	109	18

325 rows × 15 columns

v)Applying function on a column

Increase all the values of "MPG_City" column by 3.

```
In [62]: car

Out[62]:
```

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horsepower	MPG_City	MPG_Highway	Weight	Wheelbase	Lengt
0	Acura	MDX	SUV	Asia	All	\$36,945	\$33,337	3.5	6.0	265	20	23	4451	106	18
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	\$23,820	\$21,761	2.0	4.0	200	27	31	2778	101	17
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426	Volvo	V40	Wagon	Europe	Front	\$26,135	\$24,641	1.9	4.0	170	25	29	2822	101	18
427	Volvo	XC70	Wagon	Europe	All	\$35,145	\$33,112	2.5	5.0	208	23	27	3823	109	18

428 rows × 15 columns