

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 this data set using the Pandas DataFrame.

```
In [12]: import pandas as pd
```

```
In [13]: car = pd.read_csv(r"E:\Personal Python Projects\Cars data set project\Project+2+-+C
```

```
In [14]: car.head()
```

```
Out[14]:
```

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horse
0	Acura	MDX	SUV	Asia	All	\$36,945	\$33,337	3.5	6.0	
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	\$23,820	\$21,761	2.0	4.0	
2	Acura	TSX 4dr	Sedan	Asia	Front	\$26,990	\$24,647	2.4	4.0	
3	Acura	TL 4dr	Sedan	Asia	Front	\$33,195	\$30,299	3.2	6.0	
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	\$43,755	\$39,014	3.5	6.0	

```
In [15]: car.shape
```

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

```
In [ ]:
```

1. Instruction (For Data Cleaning)

- Find all Null Values in the dataset. If there is any null value in any column, then fill it with the mean of that column.

```
In [39]: car.isnull().sum()
```

```
Out[39]: 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 [48]: car['Cylinders'].fillna(car['Cylinders'].mean(), inplace=True)
```

```
In [49]: car.dropna(inplace=True)
```

```
In [50]: print(car.isnull().sum())
```

```
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 types of Make are there in our dataset. And, what is the count (occurrence) of each Make in the data

?

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

Out[17]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horse
0	Acura	MDX	SUV	Asia	All	\$36,945	\$33,337	3.5	6.0	
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	\$23,820	\$21,761	2.0	4.0	



In [55]: `car['Make'].value_counts()`

Out[55]:

Make	
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: count, dtype: int64

3. Instruction (Filtering)

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

In [65]: `car[(car['Origin']=='Asia') | (car['Origin']=='Europe')]`

Out[65]:

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

281 rows × 15 columns



In [66]: `car[car['Origin'].isin(['Asia','Europe'])]`

Out[66]:

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

281 rows × 15 columns



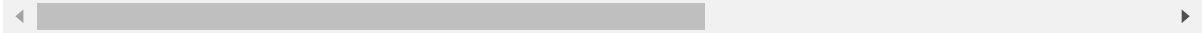
4. Instruction (Removing unwanted records)

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

In [25]: `car.head(2)`

Out[25]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinders	Horse
0	Acura	MDX	SUV	Asia	All	\$36,945	\$33,337	3.5	6.0	
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	\$23,820	\$21,761	2.0	4.0	



In [68]: `car[~(car['Weight']>4000)]`

Out[68]:

	Make	Model	Type	Origin	DriveTrain	MSRP	Invoice	EngineSize	Cylinder
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	\$23,820	\$21,761	2.0	4
2	Acura	TSX 4dr	Sedan	Asia	Front	\$26,990	\$24,647	2.4	4
3	Acura	TL 4dr	Sedan	Asia	Front	\$33,195	\$30,299	3.2	6
4	Acura	3.5 RL 4dr	Sedan	Asia	Front	\$43,755	\$39,014	3.5	6
5	Acura	3.5 RL w/Navigation 4dr	Sedan	Asia	Front	\$46,100	\$41,100	3.5	6
...
427	Volvo	C70 LPT convertible 2dr	Sedan	Europe	Front	\$40,565	\$38,203	2.4	5
428	Volvo	C70 HPT convertible 2dr	Sedan	Europe	Front	\$42,565	\$40,083	2.3	5
429	Volvo	S80 T6 4dr	Sedan	Europe	Front	\$45,210	\$42,573	2.9	6
430	Volvo	V40	Wagon	Europe	Front	\$26,135	\$24,641	1.9	4
431	Volvo	XC70	Wagon	Europe	All	\$35,145	\$33,112	2.5	5

325 rows × 15 columns

In [10]:

428 - 103

Out[10]: 325

5. Instruction (Applying function on a column)

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

In [11]:

car.head(2)

Out[11]:

	Make	Model	Type	Origin	DriveTrain	Unnamed: 5	MSRP	Invoice	EngineSize	Cylir
0	Acura	MDX	SUV	Asia	All	NaN	\$36,945	\$33,337	3.5	
1	Acura	RSX Type S 2dr	Sedan	Asia	Front	NaN	\$23,820	\$21,761	2.0	

In [69]: `car['MPG_City']=car['MPG_City'].apply(lambda x:x+3)`In [70]: `car`

Out[70]:

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

428 rows × 15 columns