

PROJECT TITLE:

Analyzing the sales data

AIM:

Analysing data using python modules Pandas,Numpy,Matplotlib,Seaborn, and pyplot.

CODE:

```
In [1]: import pandas as pd
import glob
import matplotlib.pyplot as plt
import seaborn as sns

In [2]: data = pd.read_csv("C:/users/mateji shiva/Downloads/apple_products.csv")
data

Out[2]:
```

	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating	Ram
0	APPLE iPhone 8 Plus (Gold, 64 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	49900	49900	0	3431	356	MOBEXRGVGEHHTGUH	4.6	2 GB
1	APPLE iPhone 8 Plus (Space Grey, 256 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	84900	84900	0	3431	356	MOBEXRGVGEHHTGUH	4.6	2 GB
2	APPLE iPhone 8 Plus (Silver, 256 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	84900	84900	0	3431	356	MOBEXRGVGEHHTGUH	4.6	2 GB
3	APPLE iPhone 8 (Silver, 256 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	77000	77000	0	11202	794	MOBEXRGVGEHHTGUH	4.5	2 GB
4	APPLE iPhone 8 (Gold, 256 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	77000	77000	0	11202	794	MOBEXRGVGEHHTGUH	4.5	2 GB
...	...	...	...	...	...	...	...	...	...	...	...
57	APPLE iPhone SE (Black, 64 GB)	https://www.flipkart.com/apple-iphone-se-black.../	Apple	29999	39900	24	95909	8161	MOBFWQBGR3MKTAUG	4.5	4 GB
58	APPLE iPhone 11 (Purple, 64 GB)	https://www.flipkart.com/apple-iphone-11-purpl.../	Apple	46999	54900	14	43470	3331	MOBFWQBGR3MKTAUG	4.6	4 GB
59	APPLE iPhone 11 (White, 64 GB)	https://www.flipkart.com/apple-iphone-11-whit.../	Apple	46999	54900	14	43470	3331	MOBFWQBGR3MKTAUG	4.6	4 GB
60	APPLE iPhone 11 (Black, 64 GB)	https://www.flipkart.com/apple-iphone-11-black.../	Apple	46999	54900	14	43470	3331	MOBFWQBGR3MKTAUG	4.6	4 GB
61	APPLE iPhone 11 (Red, 64 GB)	https://www.flipkart.com/apple-iphone-11-red.../	Apple	46999	54900	14	43470	3331	MOBFWQBGR3MKTAUG	4.6	4 GB
62 rows x 11 columns											

```
In [3]: data.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 62 entries, 0 to 61
Data columns (total 11 columns):
#   Column            Non-Null Count  Dtype
---  --
0   Product Name      62 non-null    object
1   Product URL       62 non-null    object
2   Brand             62 non-null    object
3   Sale Price        62 non-null    int64
4   Mrp               62 non-null    int64
5   Discount Percentage 62 non-null    int64
6   Number of Ratings 62 non-null    int64
7   Number of Reviews 62 non-null    int64
8   Upc               62 non-null    object
9   Star Rating       62 non-null    float64
10  Ram               62 non-null    object
dtypes: float64(1), int64(5), object(5)
memory usage: 5.5+ KB

In [4]: data.describe()

Out[4]:
```

	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Star Rating
count	62.000000	62.000000	62.000000	62.000000	62.000000	62.000000
mean	80073.887997	88659.064516	9.951613	23425.403226	1861.677419	4.575966
std	34310.446132	34729.825567	7.408079	23768.598550	2656.863830	0.679190
min	29999.000000	39900.000000	0.000000	542.000000	42.000000	4.500000
25%	49900.000000	54900.000000	0.000000	740.000000	64.000000	4.500000
50%	79900.000000	79900.000000	10.000000	2101.000000	180.000000	4.600000
75%	117100.000000	129950.000000	14.000000	43470.000000	3331.000000	4.600000
max	140900.000000	149900.000000	28.000000	95909.000000	8161.000000	4.700000

```
In [5]: data.isnull().sum()

Out[5]:
Product Name      0
Product URL      0
Brand            0
Sale Price       0
Mrp              0
Discount Percentage 0
Number of Ratings 0
Number of Reviews 0
Upc              0
Star Rating      0
Ram              0
dtype: int64

In [6]: data.columns

Out[6]:
Index(['Product Name', 'Product URL', 'Brand', 'Sale Price', 'Mrp',
       'Discount Percentage', 'Number of Ratings', 'Number of Reviews', 'Upc',
       'Star Rating', 'Ram'],
      dtype='object')

In [7]: data.shape

Out[7]:
(62, 11)

In [8]: data['Product Name'].describe()

Out[8]:
count      62
unique      62
APPLE iPhone 8 Plus (Gold, 64 GB)      1
freq Name: Product Name, dtype: object

In [9]: data['Sale Price'].describe()

Out[9]:
count      62
mean      80073.887997
std       34310.446132
min       29999.000000
25%       49900.000000
50%       79900.000000
75%       117100.000000
max       140900.000000
Name: Sale Price, dtype: float64

In [10]: data['Discount Percentage'].mean()

Out[10]:
9.951612903225806

In [11]: data['Discount Percentage'].max()

Out[11]:
29

In [12]: data['Discount Percentage'].min()

Out[12]:
0

In [13]: data['Discount Percentage'].median()

Out[13]:
19.9

In [14]: data['Discount Percentage'].var()

Out[14]:
67.882866288355345

In [15]: data[10:21]

Out[15]:
```

	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating	Ram
10	Apple iPhone XR (Black, 64 GB) (Includes EarP...	https://www.flipkart.com/apple-iphone-xr-black.../	Apple	39999	47900	16	78512	6796	MOBFXZT7PHGV4GNH	4.6	4 GB
11	Apple iPhone XR (Coral, 128 GB) (Includes EarP...	https://www.flipkart.com/apple-iphone-xr-black.../	Apple	41999	52900	20	79582	6904	MOBFXZT7ZSG6FJZAC	4.6	4 GB
12	Apple iPhone XR (Black, 128 GB) (Includes EarP...	https://www.flipkart.com/apple-iphone-xr-black.../	Apple	41999	52900	20	78512	6796	MOBFXZT7ZVWNGZUC	4.6	4 GB
13	Apple iPhone XR (White, 128 GB) (Includes EarP...	https://www.flipkart.com/apple-iphone-xr-black.../	Apple	41999	52900	20	79582	6796	MOBFXZT7ZVWNGZUC	4.6	4 GB
14	APPLE iPhone 11 Pro Max (Gold, 256 GB)	https://www.flipkart.com/apple-iphone-11-pro-m.../	Apple	131900	131900	0	1078	101	MOBKFCTSTCHHSFPH	4.7	4 GB
15	APPLE iPhone 11 Pro Max (Space Grey, 64 GB)	https://www.flipkart.com/apple-iphone-11-pro-m.../	Apple	117100	117100	0	1078	101	MOBKFCTSCAANKGV7	4.7	4 GB
16	APPLE iPhone 11 Pro Max (Midnight Green, 64 GB)	https://www.flipkart.com/apple-iphone-11-pro-m.../	Apple	117100	131900	0	1078	101	MOBKFCTSCAANKGV7	4.7	4 GB
17	APPLE iPhone 11 Pro Max (Silver, 256 GB)	https://www.flipkart.com/apple-iphone-11-pro-m.../	Apple	131900	139900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB
18	APPLE iPhone 11 Pro Max (Pacific Blue, 128 GB)	https://www.flipkart.com/apple-iphone-11-pro-m.../	Apple	74999	106600	29	7088	523	MOBKFCTSN3TG3RFJ	4.6	4 GB
19	APPLE iPhone 11 Pro (Space Grey, 128 GB)	https://www.flipkart.com/apple-iphone-11-pro-m.../	Apple	117900	140300	15	7088	523	MOBKFCTSRHTHQFTT	4.6	4 GB
20	APPLE iPhone 11 Pro Max (Midnight Green, 64 GB)	https://www.flipkart.com/apple-iphone-11-pro-m.../	Apple	117100	117100	0	1078	101	MOBKFCTSRYPANQYT	4.7	4 GB

```
In [16]: data[data.Ram=='6 GB']

Out[16]:
```

	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating	Ram
25	APPLE iPhone SE (White, 64 GB) (Includes EarP...	https://www.flipkart.com/apple-iphone-se-white.../	Apple	130000	139900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB
27	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	120000	129900	6	545	42	MOBFWBYZ2H4AMFBE	4.5	6 GB
29	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	79000	84900	10	2101	180	MOBFWBYZ2H4AMFBE	4.6	6 GB
30	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	110000	119900	7	545	42	MOBFWBYZ2H4AMFBE	4.5	6 GB
31	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	130000	139900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB
32	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	120000	129900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB
35	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	79000	84900	10	2101	180	MOBFWBYZ2H4AMFBE	4.6	6 GB
36	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	79000	84900	10	2101	180	MOBFWBYZ2H4AMFBE	4.6	6 GB
37	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	120000	129900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB
38	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	59900	69900	14	740	64	MOBFWBYZ2H4AMFBE	4.5	6 GB
39	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	120000	129900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB
40	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	79000	84900	10	2092	178	MOBFWBYZ2H4AMFBE	4.6	6 GB
42	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	70000	79900	11	2101	180	MOBFWBYZ2H4AMFBE	4.6	6 GB
43	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	70000	79900	11	2092	178	MOBFWBYZ2H4AMFBE	4.6	6 GB
44	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	79000	84900	10	2101	180	MOBFWBYZ2H4AMFBE	4.6	6 GB
46	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	110000	119900	7	545	42	MOBFWBYZ2H4AMFBE	4.5	6 GB
47	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	120000	129900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB
48	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	130000	139900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB
49	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	130000	139900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB

```
In [17]: data[data['Number Of Reviews']>7000]

Out[17]:
```

	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating	Ram
23	Apple iPhone SE (White, 256 GB) (Includes EarP...	https://www.flipkart.com/apple-iphone-se-white.../	Apple	44999	54900	18	95909	8161	MOBFRFXZTCHZAPHEH	4.5	2 GB
52	APPLE iPhone SE (White, 64 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	29999	39900	24	95807	8154	MOBFWQBGR3MKTAUG	4.5	2 GB
53	APPLE iPhone SE (White, 128 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	34999	44900	22	95909	8161	MOBFWQBGR3MKTAUG	4.5	2 GB
54	APPLE iPhone SE (White, 128 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	34999	44900	22	95807	8154	MOBFWQBGR3MKTAUG	4.5	2 GB
55	APPLE iPhone SE (White, 128 GB)	https://www.flipkart.com/apple-iphone-se-white.../	Apple	34999	44900	22	95909	8161	MOBFWQBGR3MKTAUG	4.5	2 GB
57	APPLE iPhone SE (Black, 64 GB)	https://www.flipkart.com/apple-iphone-se-black.../	Apple	29999	39900	24	95909	8161	MOBFWQBGR3MKTAUG	4.5	4 GB

```
In [18]: data[data['Sale Price']>130000]

Out[18]:
```

	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating	Ram
14	APPLE iPhone 11 Pro Max (Gold, 256 GB)	https://www.flipkart.com/apple-iphone-11-pro-m.../	Apple	131900	131900	0	1078	101	MOBKFCTSTCHHSFPH	4.7	4 GB
16	APPLE iPhone 11 Pro Max (Midnight Green, 256 GB)	https://www.flipkart.com/apple-iphone-11-pro-m.../	Apple	131900	131900	0	1078	101	MOBKFCTSCAANKGV7	4.7	4 GB
24	APPLE iPhone 12 Pro (Silver, 512 GB)	https://www.flipkart.com/apple-iphone-12-pro-m.../	Apple	140900	149900	6	542	42	MOBFWBYZ2H4AMFBE	4.5	4 GB
25	APPLE iPhone 12 Pro Max (Pacific Blue, 256 GB)	https://www.flipkart.com/apple-iphone-12-pro-m.../	Apple	130900	139900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB
31	APPLE iPhone 12 Pro Max (Graphite, 256 GB)	https://www.flipkart.com/apple-iphone-12-pro-m.../	Apple	130900	139900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB
41	APPLE iPhone 12 Pro Max (Pacific Blue, 512 GB)	https://www.flipkart.com/apple-iphone-12-pro-m.../	Apple	140900	149900	6	545	42	MOBFWBYZ2H4AMFBE	4.5	4 GB
48	APPLE iPhone 12 Pro Max (Silver, 256 GB)	https://www.flipkart.com/apple-iphone-12-pro-m.../	Apple	130900	139900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB
49	APPLE iPhone 12 Pro Max (Gold, 256 GB)	https://www.flipkart.com/apple-iphone-12-pro-m.../	Apple	130900	139900	6	580	45	MOBFWBYZ2H4AMFBE	4.6	6 GB

```
In [19]: data.set_index('Product Name', inplace=True)

In [20]: data

Out[20]:
```

	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating	Ram
	APPLE iPhone 8 Plus (Gold, 64 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	49900	49900	0	3431	356	MOBEXRGVGEHHTGUH	4.6	2 GB
	APPLE iPhone 8 Plus (Space Grey, 256 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	84900	84900	0	3431	356	MOBEXRGVGEHHTGUH	4.6	2 GB
	APPLE iPhone 8 Plus (Silver, 256 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	84900	84900	0	3431	356	MOBEXRGVGEHHTGUH	4.6	2 GB
	APPLE iPhone 8 (Silver, 256 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	77000	77000	0	11202	794	MOBEXRGVGEHHTGUH	4.5	2 GB
	APPLE iPhone 8 (Gold, 256 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	77000	77000	0	11202	794	MOBEXRGVGEHHTGUH	4.5	2 GB
	...	...	...	...	...	...	...	...	...	...	...
	APPLE iPhone SE (Black, 64 GB)	https://www.flipkart.com/apple-iphone-se-black.../	Apple	29999	39900	24	95909	8161	MOBFWQBGR3MKTAUG	4.5	4 GB
	APPLE iPhone 11 (Purple, 64 GB)	https://www.flipkart.com/apple-iphone-11-purpl.../	Apple	46999	54900	14	43470	3331	MOBFWQBGR3MKTAUG	4.6	4 GB
	APPLE iPhone 11 (White, 64 GB)	https://www.flipkart.com/apple-iphone-11-whit.../	Apple	46999	54900	14	43470	3331	MOBFWQBGR3MKTAUG	4.6	4 GB
	APPLE iPhone 11 (Black, 64 GB)	https://www.flipkart.com/apple-iphone-11-black.../	Apple	46999	54900	14	43470	3331	MOBFWQBGR3MKTAUG	4.6	4 GB
	APPLE iPhone 11 (Red, 64 GB)	https://www.flipkart.com/apple-iphone-11-red.../	Apple	46999	54900	14	43470	3331	MOBFWQBGR3MKTAUG	4.6	4 GB
62 rows x 10 columns											

```
In [21]: data.reset_index(inplace=True)

In [22]: data

Out[22]:
```

	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating	Ram
0	APPLE iPhone 8 Plus (Gold, 64 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	49900	49900	0	3431	356	MOBEXRGVGEHHTGUH	4.6	2 GB
1	APPLE iPhone 8 Plus (Space Grey, 256 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	84900	84900	0	3431	356	MOBEXRGVGEHHTGUH	4.6	2 GB
2	APPLE iPhone 8 Plus (Silver, 256 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	84900	84900	0	3431	356	MOBEXRGVGEHHTGUH	4.6	2 GB
3	APPLE iPhone 8 (Silver, 256 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	77000	77000	0	11202	794	MOBEXRGVGEHHTGUH	4.5	2 GB
4	APPLE iPhone 8 (Gold, 256 GB)	https://www.flipkart.com/apple-iphone-8-plus-g.../	Apple	77000	77000	0	11202	794	MOBEXRGVGEHHTGUH	4.5	2 GB
...	...	...	...	...	...	...	...	...	...	...	...
57	APPLE iPhone SE (Black, 64 GB)	https://www.flipkart.com/apple-iphone-se-black.../	Apple	29999	39900	24	95909	8161	MOBFWQBGR3MKTAUG	4.5	4 GB
58	APPLE iPhone 11 (Purple, 64 GB)	https://www.flipkart.com/apple-iphone-11-purpl.../	Apple	46999	54900	14	43470	3331	MOBFWQBGR3MKTAUG	4.6	4 GB
59	APPLE iPhone 11 (White, 64 GB)	https://www.flipkart.com/apple-iphone-11-whit.../	Apple	46999	54900	14	43470	3331	MOBFWQBGR3MKTAUG	4.6	4 GB
60	APPLE iPhone 11 (Black, 64 GB)	https://www.flipkart.com/apple-iphone-11-black.../	Apple	46							