Day 21

Project

iPhone Sales Analysis

Objective : iphone sale analysis

(1) Data Clean : [pandas, numpy]

(2) Data Analysis

(3) Data Visualize [Bar, Scatter]

```python
import pandas as pd
import numpy as np
import plotly.express as px
import plotly.graph_objects as go

data = pd.read_csv("apple_products.csv")

data
```

```
                                 Product Name  \
0          APPLE iPhone 8 Plus (Gold, 64 GB)
1    APPLE iPhone 8 Plus (Space Grey, 256 GB)
2        APPLE iPhone 8 Plus (Silver, 256 GB)
3             APPLE iPhone 8 (Silver, 256 GB)
4               APPLE iPhone 8 (Gold, 256 GB)
..                                        ...
57            APPLE iPhone SE (Black, 64 GB)
58           APPLE iPhone 11 (Purple, 64 GB)
59            APPLE iPhone 11 (White, 64 GB)
60            APPLE iPhone 11 (Black, 64 GB)
61              APPLE iPhone 11 (Red, 64 GB)

                                 Product URL  Brand  Sale
Price  \
0   https://www.flipkart.com/apple-iphone-8-plus-g...  Apple
49900
1    https://www.flipkart.com/apple-iphone-8-plus-s...  Apple
84900
2    https://www.flipkart.com/apple-iphone-8-plus-s...  Apple
84900
3    https://www.flipkart.com/apple-iphone-8-silver...  Apple
```

```
77000
4   https://www.flipkart.com/apple-iphone-8-gold-2...   Apple
77000
..                                                  ...   ...        .
..
57  https://www.flipkart.com/apple-iphone-se-black...   Apple
29999
58  https://www.flipkart.com/apple-iphone-11-purpl...   Apple
46999
59  https://www.flipkart.com/apple-iphone-11-white...   Apple
46999
60  https://www.flipkart.com/apple-iphone-11-black...   Apple
46999
61  https://www.flipkart.com/apple-iphone-11-red-6...   Apple
46999

       Mrp  Discount Percentage  Number Of Ratings  Number Of
Reviews \
0    49900                    0               3431                356

1    84900                    0               3431                356

2    84900                    0               3431                356

3    77000                    0              11202                794

4    77000                    0              11202                794

..     ...                  ...                ...                ...

57   39900                   24              95909               8161

58   54900                   14              43470               3331

59   54900                   14              43470               3331

60   54900                   14              43470               3331

61   54900                   14              43470               3331


              Upc  Star Rating   Ram
0    MOBEXRGV7EHHTGUH          4.6  2 GB
1    MOBEXRGVAC6TJT4F          4.6  2 GB
2    MOBEXRGVGETABXWZ          4.6  2 GB
3    MOBEXRGVMZWUHCBA          4.5  2 GB
4    MOBEXRGVPK7PFEJZ          4.5  2 GB
..                ...          ...   ...
57   MOBFWQ6BR3MK7AUG          4.5  4 GB
58   MOBFWQ6BTFFJKGKE          4.6  4 GB
```

```
59   MOBFWQ6BVWVEH3XE            4.6   4 GB
60   MOBFWQ6BXGJCEYNY           4.6   4 GB
61   MOBFWQ6BYYV3FCU7           4.6   4 GB

[62 rows x 11 columns]
```

```
print(data.isnull().sum())
```

```
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
```

```
print(data.describe)
```

```
<bound method NDFrame.describe of
Product Name  \
0            APPLE iPhone 8 Plus (Gold, 64 GB)
1     APPLE iPhone 8 Plus (Space Grey, 256 GB)
2         APPLE iPhone 8 Plus (Silver, 256 GB)
3              APPLE iPhone 8 (Silver, 256 GB)
4                APPLE iPhone 8 (Gold, 256 GB)
..                                        ...
57               APPLE iPhone SE (Black, 64 GB)
58             APPLE iPhone 11 (Purple, 64 GB)
59              APPLE iPhone 11 (White, 64 GB)
60              APPLE iPhone 11 (Black, 64 GB)
61                APPLE iPhone 11 (Red, 64 GB)


                                      Product URL  Brand  Sale
Price  \
0   https://www.flipkart.com/apple-iphone-8-plus-g...  Apple
49900
1   https://www.flipkart.com/apple-iphone-8-plus-s...  Apple
84900
2   https://www.flipkart.com/apple-iphone-8-plus-s...  Apple
84900
3   https://www.flipkart.com/apple-iphone-8-silver...  Apple
77000
4   https://www.flipkart.com/apple-iphone-8-gold-2...  Apple
77000
..                                                ...    ...      .
```

```
..
57  https://www.flipkart.com/apple-iphone-se-black...   Apple
29999
58  https://www.flipkart.com/apple-iphone-11-purpl...   Apple
46999
59  https://www.flipkart.com/apple-iphone-11-white...   Apple
46999
60  https://www.flipkart.com/apple-iphone-11-black...   Apple
46999
61  https://www.flipkart.com/apple-iphone-11-red-6...   Apple
46999

      Mrp  Discount Percentage  Number Of Ratings  Number Of
Reviews  \
0    49900                    0               3431                356

1    84900                    0               3431                356

2    84900                    0               3431                356

3    77000                    0              11202                794

4    77000                    0              11202                794

..     ...                  ...                ...                ...

57   39900                   24              95909               8161

58   54900                   14              43470               3331

59   54900                   14              43470               3331

60   54900                   14              43470               3331

61   54900                   14              43470               3331


                Upc  Star Rating   Ram
0    MOBEXRGV7EHHTGUH          4.6  2 GB
1    MOBEXRGVAC6TJT4F          4.6  2 GB
2    MOBEXRGVGETABXWZ          4.6  2 GB
3    MOBEXRGVMZWUHCBA          4.5  2 GB
4    MOBEXRGVPK7PFEJZ          4.5  2 GB
..                ...          ...   ...
57   MOBFWQ6BR3MK7AUG          4.5  4 GB
58   MOBFWQ6BTFFJKGKE          4.6  4 GB
59   MOBFWQ6BVWVEH3XE          4.6  4 GB
60   MOBFWQ6BXGJCEYNY          4.6  4 GB
61   MOBFWQ6BYYV3FCU7          4.6  4 GB

[62 rows x 11 columns]>
```

iPhone Sales Analysis in India

```
highest_rated = data.sort_values(by = ["Star Rating"],ascending =
False)
highest_rated.head()
print(highest_rated['Product Name'])

20        APPLE iPhone 11 Pro Max (Midnight Green, 64 GB)
17          APPLE iPhone 11 Pro Max (Space Grey, 64 GB)
16      APPLE iPhone 11 Pro Max (Midnight Green, 256 GB)
15               APPLE iPhone 11 Pro Max (Gold, 64 GB)
14              APPLE iPhone 11 Pro Max (Gold, 256 GB)
                          ...
45                     APPLE iPhone 12 Mini (Black, 64 GB)
28                     APPLE iPhone 12 Mini (White, 64 GB)
23       Apple iPhone SE (White, 256 GB) (Includes EarP...
41                APPLE iPhone 12 Pro (Pacific Blue, 512 GB)
27                APPLE iPhone 12 Pro (Graphite, 256 GB)
Name: Product Name, Length: 62, dtype: object
```

lets a look at the number of ratings of the highest rated iphone on flipkart

```
iphones =  highest_rated["Product Name"].value_counts()
labels = iphones.index
counts = highest_rated["Number Of Ratings"]
figure = px.bar(highest_rated, x=labels, y=counts, title = "Number of
Highest rated iphones")
figure.show()
```

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Adapter)","Apple iPhone XR (White, 128 GB) (Includes EarPods, Power
Adapter)","APPLE iPhone 11 Pro (Midnight Green, 64 GB)","APPLE iPhone
11 (Red, 64 GB)","APPLE iPhone 11 Pro (Space Grey, 256 GB)","APPLE
iPhone 11 Pro (Midnight Green, 512 GB)","APPLE iPhone 12 Pro Max
(Pacific Blue, 256 GB)","APPLE iPhone 12 Mini (Red, 64 GB)","APPLE
iPhone SE (White, 64 GB)","APPLE iPhone 12 Mini (White, 128
GB)","APPLE iPhone 8 (Silver, 256 GB)","APPLE iPhone SE (Black, 64

GB)","APPLE iPhone 11 Pro Max (Space Grey, 64 GB)","APPLE iPhone 12 Pro (Graphite, 128 GB)","APPLE iPhone SE (Red, 128 GB)","APPLE iPhone SE (White, 128 GB)","APPLE iPhone SE (Black, 128 GB)","APPLE iPhone 8 (Space Grey, 256 GB)","APPLE iPhone 12 Pro (Silver, 512 GB)","APPLE iPhone 12 Mini (Black, 128 GB)","APPLE iPhone 12 Mini (Blue, 128 GB)","APPLE iPhone 12 Pro (Pacific Blue, 128 GB)","APPLE iPhone 12 Mini (Black, 64 GB)","APPLE iPhone 12 Mini (White, 64 GB)","Apple iPhone SE (White, 256 GB) (Includes EarPods, Power Adapter)","APPLE iPhone 12 Pro (Pacific Blue, 512 GB)","APPLE iPhone XS Max (Silver, 64 GB)","APPLE iPhone 8 Plus (Space Grey, 64 GB)","APPLE iPhone 8 Plus (Silver, 64 GB)","APPLE iPhone 8 Plus (Silver, 256 GB)","APPLE iPhone 11 Pro Max (Midnight Green, 256 GB)","APPLE iPhone 11 Pro Max (Gold, 64 GB)","APPLE iPhone 11 Pro Max (Gold, 256 GB)","APPLE iPhone 8 Plus (Gold, 64 GB)","APPLE iPhone 12 (White, 128 GB)","APPLE iPhone 12 Pro Max (Graphite, 128 GB)","APPLE iPhone 12 (Black, 128 GB)","APPLE iPhone 12 (Blue, 128 GB)","APPLE iPhone 12 Pro Max (Silver, 128 GB)","APPLE iPhone 12 Pro Max (Gold, 128 GB)","APPLE iPhone 12 (Green, 128 GB)","APPLE iPhone 12 (White, 64 GB)","APPLE iPhone 12 (Black, 64 GB)","APPLE iPhone 12 (Red, 128 GB)","APPLE iPhone 12 Pro Max (Pacific Blue, 128 GB)","APPLE iPhone 12 Pro Max (Silver, 256 GB)","APPLE iPhone 12 Pro Max (Gold, 256 GB)","APPLE iPhone 11 (White, 128 GB)","APPLE iPhone 11 (Red, 128 GB)","APPLE iPhone 11 (Black, 128 GB)","APPLE iPhone 11 (Purple, 64 GB)","APPLE iPhone 11 (White, 64 GB)","APPLE iPhone 11 (Black, 64 GB)","APPLE iPhone 8 Plus (Space Grey, 256 GB)","APPLE iPhone 12 Pro Max (Graphite, 256 GB)","Apple iPhone XR (Coral, 128 GB) (Includes EarPods, Power Adapter)","APPLE iPhone 11 Pro (Space Grey, 512 GB)","APPLE iPhone 12 Pro (Graphite, 256 GB)"],"xaxis":"x","y":
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iphones

Product Name
APPLE iPhone 11 Pro Max (Midnight Green, 64 GB)
1
APPLE iPhone 8 (Gold, 256 GB)
1
Apple iPhone XR ((PRODUCT)RED, 128 GB) (Includes EarPods, Power
Adapter)   1
Apple iPhone XR (Black, 64 GB) (Includes EarPods, Power Adapter)
1
Apple iPhone XR (Black, 128 GB) (Includes EarPods, Power Adapter)
1
               ..
APPLE iPhone 8 Plus (Space Grey, 256 GB)
1
APPLE iPhone 12 Pro Max (Graphite, 256 GB)
1
Apple iPhone XR (Coral, 128 GB) (Includes EarPods, Power Adapter)
1
APPLE iPhone 11 Pro (Space Grey, 512 GB)
1
APPLE iPhone 12 Pro (Graphite, 256 GB)
1
Name: count, Length: 62, dtype: int64

```
iphones =  highest_rated["Product Name"].value_counts()
labels = iphones.index
counts = highest_rated["Number Of Reviews"]
figure = px.bar(highest_rated, x=labels, y=counts, title = "Number of
```

```
Highest rated iphones")
figure.show()

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Adapter)","Apple iPhone XR (Black, 128 GB) (Includes EarPods, Power
Adapter)","Apple iPhone XR (White, 128 GB) (Includes EarPods, Power
Adapter)","APPLE iPhone 11 Pro (Midnight Green, 64 GB)","APPLE iPhone
11 (Red, 64 GB)","APPLE iPhone 11 Pro (Space Grey, 256 GB)","APPLE
iPhone 11 Pro (Midnight Green, 512 GB)","APPLE iPhone 12 Pro Max
(Pacific Blue, 256 GB)","APPLE iPhone 12 Mini (Red, 64 GB)","APPLE
iPhone SE (White, 64 GB)","APPLE iPhone 12 Mini (White, 128
GB)","APPLE iPhone 8 (Silver, 256 GB)","APPLE iPhone SE (Black, 64
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(Space Grey, 256 GB)","APPLE iPhone 12 Pro (Silver, 512 GB)","APPLE
iPhone 12 Mini (Black, 128 GB)","APPLE iPhone 12 Mini (Blue, 128
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Mini (Black, 64 GB)","APPLE iPhone 12 Mini (White, 64 GB)","Apple
iPhone SE (White, 256 GB) (Includes EarPods, Power Adapter)","APPLE
iPhone 12 Pro (Pacific Blue, 512 GB)","APPLE iPhone XS Max (Silver, 64
GB)","APPLE iPhone 8 Plus (Space Grey, 64 GB)","APPLE iPhone 8 Plus
(Silver, 64 GB)","APPLE iPhone 8 Plus (Silver, 256 GB)","APPLE iPhone
11 Pro Max (Midnight Green, 256 GB)","APPLE iPhone 11 Pro Max (Gold,
64 GB)","APPLE iPhone 11 Pro Max (Gold, 256 GB)","APPLE iPhone 8 Plus
(Gold, 64 GB)","APPLE iPhone 12 (White, 128 GB)","APPLE iPhone 12 Pro
Max (Graphite, 128 GB)","APPLE iPhone 12 (Black, 128 GB)","APPLE
iPhone 12 (Blue, 128 GB)","APPLE iPhone 12 Pro Max (Silver, 128
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GB)","APPLE iPhone 12 (Red, 128 GB)","APPLE iPhone 12 Pro Max (Pacific
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iPhone 12 Pro Max (Gold, 256 GB)","APPLE iPhone 11 (White, 128
GB)","APPLE iPhone 11 (Red, 128 GB)","APPLE iPhone 11 (Black, 128
GB)","APPLE iPhone 11 (Purple, 64 GB)","APPLE iPhone 11 (White, 64
GB)","APPLE iPhone 11 (Black, 64 GB)","APPLE iPhone 8 Plus (Space
Grey, 256 GB)","APPLE iPhone 12 Pro Max (Graphite, 256 GB)","Apple
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figure.show()
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figure = px.scatter(data_frame=data, x = "Number Of Ratings",
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and number of rating")

figure.show()
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Thank You