# iphones-sales-analysis

[1]:
```
import pandas as pd
import numpy as np
import plotly.express as px
import plotly.graph_objects as go
```

[2]:
```
data = pd.read_csv("apple_products.csv")
```

[3]:
```
data.head()
```

[3]:

| | 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 | MOBEXRGV7EHHTGUH | 4.6 | 2 GB |
| 1 | APPLE iPhone 8 Plus (Space Grey, 256 GB) | https://www.flipkart.com/apple-iphone-8-plus-s… | Apple | 84900 | 84900 | 0 | 3431 | 356 | MOBEXRGVAC6TJT4F | 4.6 | 2 GB |
| 2 | APPLE iPhone 8 Plus (Silver, 256 GB) | https://www.flipkart.com/apple-iphone-8-plus-s… | Apple | 84900 | 84900 | 0 | 3431 | 356 | MOBEXRGVGETABXWZ | 4.6 | 2 GB |
| 3 | APPLE iPhone 8 (Silver, 256 GB) | https://www.flipkart.com/apple-iphone-8-silver… | Apple | 77000 | 77000 | 0 | 11202 | 794 | MOBEXRGVMZWUHCBA | 4.5 | 2 GB |
| 4 | APPLE iPhone 8 (Gold, 256 GB) | https://www.flipkart.com/apple-iphone-8-gold-2… | Apple | 77000 | 77000 | 0 | 11202 | 794 | MOBEXRGVPK7PFEJZ | 4.5 | 2 GB |

[4]:
```
data.isnull().sum()
```

[4]:
```
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
```

#the dataset does not have any missing value

[6]:
```
data.describe()
```

[6]:

| | 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 | 80073.887097 | 88058.064516 | 9.951613 | 22420.403226 | 1861.677419 | 4.575806 |
| std | 34310.446132 | 34728.825597 | 7.608079 | 33768.589550 | 2855.883830 | 0.059190 |
| min | 29999.000000 | 39900.000000 | 0.000000 | 542.000000 | 42.000000 | 4.500000 |
| 25% | 49900.000000 | 54900.000000 | 6.000000 | 740.000000 | 64.000000 | 4.500000 |
| 50% | 75900.000000 | 79900.000000 | 10.000000 | 2101.000000 | 180.000000 | 4.600000 |
| 75% | 117100.000000 | 120950.000000 | 14.000000 | 43470.000000 | 3331.000000 | 4.600000 |
| max | 140900.000000 | 149900.000000 | 29.000000 | 95909.000000 | 8161.000000 | 4.700000 |

## 0.1 Top 10 Highest-rated iPhone on Flipkart in India

[7]:
```
highest_rated = data.sort_values(by="Star Rating", ascending=False)

highest_rated = highest_rated.head(10)
highest_rated["Product Name"]
```

[7]:
```
15                APPLE iPhone 11 Pro Max (Gold, 64 GB)
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)
14               APPLE iPhone 11 Pro Max (Gold, 256 GB)
0                     APPLE iPhone 8 Plus (Gold, 64 GB)
12    Apple iPhone XR (Black, 128 GB) (Includes EarP…
11    Apple iPhone XR (Coral, 128 GB) (Includes EarP…
9     Apple iPhone XR ((PRODUCT)RED, 128 GB) (Includ…
1               APPLE iPhone 8 Plus (Space Grey, 256 GB)
Name: Product Name, dtype: object
```

### 0.2 How many Ratings to the Highest-rated iPhones have Flipkart have?

[8]:
```
iphones = highest_rated["Product Name"].value_counts()
label = iphones.index
counts = highest_rated["Number Of Ratings"]
figure = px.bar(highest_rated, x=label, y= counts, title = "Number of Ratings␣
 ↪of Highest Rated iPhones")
figure.show()
```

### 0.3 Which iPhones has the Highest Number of Reviews on Flipkart ?

[9]:
```
iphones = highest_rated["Product Name"].value_counts()
label = iphones.index
counts = highest_rated["Number Of Reviews"]
figure = px.bar(highest_rated, x=label, y= counts, title = "Number of Reviews␣
 ↪of Highest Rated iPhones")
figure.show()
```

### 0.4 What is the Relationship between the Sale Price iPhones and the Number of Ratings on Flipkart?

[ ]:
```
figure = px.scatter(data_frame=data, x= "Number Of Ratings", y="Sale Price",
           size="Discount Percentage", trendline="ols",
          title = "Relationship between Sale Price and Number of Ratings")
figure.show()
```

#there is a negative liner relationship between the sale price of iPhones and the number of ratings. That means the phones which have lower prices sell more in India.

### 0.5 What is the Relationship between the Discount Percentage and the Number of Ratings on Flipkart?

[ ]:
```
figure = px.scatter(data_frame= data, x="Number Of Ratings", size="Sale Price",
                    y = "Discount Percentage", trendline="ols",
                    title = "Relationship between Discount Percentage and Number␣
 ↪of Ratings")
figure.show()
```

#There is a positive liner relationship between the sale price of iPhones and the number of ratings. That means the phone which has more discount is selling more.

### 0.6 Most Expensive and Least Expensive iphones

[ ]:
```
most_expensive = data.loc[data["Sale Price"].idxmax()]
most_least = data.loc[data["Sale Price"].idxmin()]

print("Most Expensive Product:")
print(most_expensive)

print()

print("\nLeast Expensive Product:")
print(most_expensive)
```