

Capstone Project

Web Scrapping Project

Web scraping is a process of automating the extraction of data in an efficient and fast way. With the help of web scraping, you can extract data from any website, no matter how large is the data, on your computer. Moreover, websites may have data that you cannot copy and paste.

There are different techniques for Data Scrapping like Scrappy, BeautifulSoup etc. The most common technique is using BeautifulSoup. It extracts the html page in any website. The data stored by web Scrapping is unstructured format. We convert the unstructured into structured data for Data analysis and exploration.

Used Packages and Library:

- Used BeautifulSoup and Requests package in Python environment to scrape the Data from Flipkart website.
- Pandas used for Data Pre-Processing and Data subsetting and cleaning
- Used matplotlib and seaborn for data visualization
- Multi-Paging Data Scrapping concept

Objective:

- Product extensively used : Iphone
- To compare Product(Iphone) against Price and Reviews and Ratings with the budget constraint of 35000 - 45000
- Select best Product with the budget available

Data Scrapping and Analysis using Python

In [1]:

```
import bs4
import requests
from fake_useragent import UserAgent
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
```

In [2]:

```
prod_t=[]
rating_t=[]
price_t=[]
final_array=[]

df=pd.DataFrame()
user_agent = UserAgent()
product_name = input("Product Name- ")
for i in range(1,5):

    url = "https://www.flipkart.com/search?q={0}&page={1}"

    # url='https://www.flipkart.com/search?q=iphone&otracker=search&otracker1=search&marketplace=FLIPKART&as-show=on&as=off&page={1}'
    url = url.format(product_name,i)

    page = requests.get(url, headers={"user-agent": user_agent.chrome})
    html = page.content

    soup = bs4.BeautifulSoup(html, "html.parser")
    products=soup.find_all("a",{"class": "_2cLu-1"})
    for item in products:
        prod_t.append(item.text)

    rating=soup.find_all("div",{"class": "hGSR34"})
    for item in rating:
        rating_t.append(item.text)

    price=soup.find_all("div",{"class": "_1vC40E"})
    for item in price:
        # price_t.append(item.text.replace('₹', ''))
        price_t.append(item.text)
```

Product Name- iphone

Scrapping Product, Rating and Price from flipkart.com

In [3]:

```
print(len(prod_t))  
print(prod_t)
```

160

['Apple iPhone 11 (Black, 64 GB)', 'Apple iPhone SE (Black, 64 GB)', 'Apple iPhone 11 (White, 64 GB)', 'Apple iPhone 7 (Black, 32 GB)', 'Apple iPhone XR (White, 64 GB)', 'Apple iPhone XR (Black, 64 GB)', 'Apple iPhone SE (White, 64 GB)', 'Apple iPhone SE (Red, 64 GB)', 'Apple iPhone 11 (Black, 128 GB)', 'Apple iPhone 11 (Green, 64 GB)', 'Apple iPhone SE (Black, 128 GB)', 'Apple iPhone 11 (White, 128 GB)', 'Flipkart SmartBuy Tempered Glass Guard for Apple iPhone...', 'RhinoShield Screen Guard for Apple iPhone 11 Pro', 'Apple iPhone 11 (Green, 128 GB)', 'Apple iPhone 11 (Purple, 128 GB)', 'Apple iPhone SE (White, 128 GB)', 'Apple iPhone XR (Coral, 64 GB)', 'Apple iPhone SE (Red, 128 GB)', 'Raptas Case Accessory Combo for All Smartphone and IOS', 'Apple iPhone 7 Plus (Black, 32 GB)', 'Apple iPhone 11 (Red, 128 GB)', 'Apple iPhone 11 (Purple, 64 GB)', 'RhinoShield Screen Guard for Apple iPhone 11 Pro Max', 'Apple iPhone XR (Blue, 128 GB)', 'Apple iPhone XR (Black, 128 GB)', 'Apple iPhone 11 (Red, 64 GB)', 'Apple iPhone 7 Plus (Gold, 32 GB)', 'FIRST IMPRESSION Front and Back Tempered Glass for Apple...', 'Raptas Docking Station Accessory Combo for Mobile', 'Apple iPhone XS (Space Grey, 64 GB)', 'Apple iPhone 6s (Space Grey, 32 GB)', 'Apple iPhone 7 Plus (Rose Gold, 32 GB)', 'Supreno Docking Station Accessory Combo for All Smartph...', 'Apple iPhone 11 Pro (Gold, 64 GB)', 'Apple iPhone 11 Pro Max (Space Grey, 64 GB)', 'Apple iPhone 11 Pro (Midnight Green, 256 GB)', 'Apple iPhone 11 Pro (Space Grey, 256 GB)', 'Apple iPhone 11 Pro Max (Gold, 64 GB)', 'Supreno Docking Station Accessory Combo for All Smartphone...', 'Apple iPhone 8 (PRODUCT)RED (Red, 256 GB)', 'Apple iPhone 11 Pro Max (Silver, 64 GB)', 'Apple iPhone 8 Plus (PRODUCT)RED (Red, 64 GB)', 'RhinoShield Screen Guard for Apple iPhone 11 Pro', 'Apple iPhone 11 Pro (Silver, 512 GB)', 'Apple iPhone 11 Pro Max (Midnight Green, 64 GB)', 'Apple iPhone 11 Pro (Space Grey, 64 GB)', 'Apple iPhone 8 Plus (Space Grey, 64 GB)', 'Apple iPhone 11 Pro (Gold, 256 GB)', 'Raptas Case Accessory Combo for All Smartphone and IOS', 'Apple iPhone XS (Space Grey, 512 GB)', 'Apple iPhone 8 Plus (Silver, 256 GB)', 'RhinoShield Tempered Glass Guard for Apple iPhone 7, Ap...', 'RhinoShield Screen Guard for Apple iPhone 11 Pro Max', 'Apple iPhone 8 Plus (Gold, 256 GB)', 'Apple iPhone 8 Plus (Gold, 64 GB)', 'Apple iPhone 8 (Gold, 256 GB)', 'Apple iPhone 8 (Silver, 256 GB)', 'Apple iPhone 7 (Rose Gold, 256 GB)', 'Ravbelli Edge To Edge Tempered Glass for Apple iPhone 6...', 'Apple iPhone 6s Plus (Space Grey, 16 GB)', 'Apple iPhone 7 Plus (Gold, 128 GB)', 'Apple iPhone XS (Silver, 512 GB)', 'Ravbelli Edge To Edge Tempered Glass for Apple iPhone 6...', 'Apple iPhone X (Silver, 256 GB)', 'Dainty Tempered Glass Guard for Apple iPhone SE 2020, A...', 'Dainty Tempered Glass Guard for Apple iPhone SE 2020, A...', 'Tiger MAX Tempered Glass Guard for Apple iPhone 7', 'PR SMART Front and Back Tempered Glass for Apple iPhone...', 'Raptas Earphone Cable Organizer Accessory Combo for Mob...', 'FIRST IMPRESSION Front and Back Tempered Glass for Appl...', 'RUNEECH Back Tempered Glass for Apple iPhone 6 Plus', 'Dainty Tempered Glass Guard for Apple iPhone 7 Plus', 'Raptas Docking Station Accessory Combo for Mobile', 'Tiger MAX Screen Guard for Apple iPhone 8', 'BlackBug Back Screen Guard for Apple iPhone 5s', 'Bodoma Back Screen Guard for Apple iPhone 11', 'FIRST IMPRESSION Front and Back Tempered Glass for Apple...', 'Payswell Tempered Glass Guard for Apple iPhone XR', 'Supreno Docking Station Accessory Combo for All Smartphone...', 'Dainty Tempered Glass Guard for Apple iPhone 6s Plus', 'Power Tempered Glass Guard for Apple iPhone SE', 'ACUTAS Back Screen Guard for Protector Film Carbon Fiber...', 'RhinoShield Screen Guard for Apple iPhone 11 Pro', 'ROAR Multicolor JOY_642J Lightning Adapter iPhone Split...', 'Karpine Edge To Edge Tempered Glass for Apple iPhone 11...', 'ACUTAS Screen Guard for Back camera Lens Apple iPhone 7...', 'SHIELD Tempered Glass Guard for Apple iPhone 5s', 'Power Tempered Glass Guard for Apple iPhone SE', 'Raptas Case Accessory Combo for All Smartphone and IOS', 'Power Tempered Glass Guard for Apple iPhone 5s', 'Tiger MAX Tempered Glass Guard for Apple iPhone 7 Plus', 'Kapaver Tempered Glass Guard for Apple iPhone 6 Plus, A...', 'RhinoShield Screen Guard for Apple iPhone 11 Pro Max', 'Dainty Tempered Glass Guard for Apple iPhone

SE 2020, A...', 'PR SMART Front and Back Tempered Glass for Apple iPhone...', 'Trajectory Universal Travel Adapter and iPhone USB Cable...', 'Power Tempered Glass Guard for Apple iPhone 6s', 'FIRST IMPRESSION Tempered Glass Guard for Apple iPhone ...', 'Ravbelli Edge To Edge Tempered Glass for Apple iPhone 6...', 'Jabox Edge To Edge Tempered Glass for Apple iPhone 6', 'RiverForest Tempered Glass Guard for apple iphone 11 pro...', 'BlackBug Back Screen Guard for Apple iPhone SE', 'Ravbelli Edge To Edge Tempered Glass for Apple iPhone 6...', 'Power Tempered Glass Guard for Apple iPhone SE', 'Marshland Tempered Glass Guard for Tempered Glass Guard...', 'ELEF Tempered Glass Guard for Anti Blue-ray Eyes Protect...', 'Micgeek Tempered Glass Guard for Apple iPhone 8, Apple ...', 'FIRST IMPRESSION Tempered Glass Guard for Apple iPhone ...', 'Raptas Earphone Cable Organizer Accessory Combo for Mobile...', 'Power Tempered Glass Guard for Apple iPhone 5s', 'BlackBug Back Screen Guard for Apple iPhone XS', 'RiverForest Edge To Edge Tempered Glass for iPhone 11 Pro...', 'Raptas Docking Station Accessory Combo for Mobile', 'Bodoma Edge To Edge Tempered Glass for Apple iPhone 11/...', 'Heartly Tempered Glass Guard for Apple iPhone 5C', 'Tough Lee Tempered Glass Guard for Apple iPhone 7 Plus', 'Snooky Screen Guard for Apple iPhone 5c', 'BlackBug Back Screen Guard for Apple iPhone 8 Plus', 'Supremo Docking Station Accessory Combo for All Smartphones...', 'Snooky Camera Lens Protector for Apple iPhone 5', 'Heartly Tempered Glass Guard for Apple iPhone 5.5 S 5G', 'Power Tempered Glass Guard for Apple iPhone 5s', 'RhinoShield Screen Guard for Apple iPhone 11 Pro', 'Power Tempered Glass Guard for Apple iPhone 6s Plus', 'Tiger MAX Tempered Glass Guard for Apple iPhone 7 Plus', 'SHIELD Tempered Glass Guard for Apple iPhone 6s', 'FIRST IMPRESSION Tempered Glass Guard for Apple iPhone ...', 'SHIELD Tempered Glass Guard for Apple iPhone X', 'Raptas Case Accessory Combo for All Smartphone and iOS', 'Heartly iPhone & Android Phone 2 In 1 OTG Mini USB Cooler...', 'Bodoma Tempered Glass Guard for Apple iPhone X', 'FIRST IMPRESSION Front and Back Tempered Glass for Apple...', 'RhinoShield Screen Guard for Apple iPhone 11 Pro Max', 'BlackBug Back Screen Guard for Apple iPhone 5', 'SHIELD Tempered Glass Guard for Apple iPhone 6s', 'Power Tempered Glass Guard for Apple iPhone 7', 'Power Tempered Glass Guard for Apple iPhone SE', 'Power Tempered Glass Guard for Apple iPhone SE', 'Ravbelli Edge To Edge Tempered Glass for Apple iPhone 6...', 'Snooky Camera Lens Protector for Apple iPhone 6 Plus', 'Power Tempered Glass Guard for Apple iPhone 5', 'Snooky Camera Lens Protector for Apple iPhone 6', 'Ravbelli Edge To Edge Tempered Glass for Apple iPhone 6...', 'Richusers Edge To Edge Tempered Glass for Apple iPhone ...', 'SHIELD Tempered Glass Guard for Apple iPhone 7', 'SHIELD Tempered Glass Guard for Apple iPhone SE', 'Power Tempered Glass Guard for Apple iPhone 8 Plus', 'PR SMART Front and Back Tempered Glass for Apple iPhone...', 'Raptas Earphone Cable Organizer Accessory Combo for Mobile...', 'Tiger MAX Edge To Edge Tempered Glass for Apple iPhone ...', 'Power Tempered Glass Guard for Apple iPhone 8', 'Power Tempered Glass Guard for Apple iPhone X', 'Raptas Docking Station Accessory Combo for Mobile', 'RiverForest Edge To Edge Tempered Glass for iPhone 11 Pro...', 'Payswell Tempered Glass Guard for Apple iPhone 7', 'BlackBug Back Screen Guard for Apple iPhone XS Max', 'SHIELD Tempered Glass Guard for Apple iPhone SE', 'Power Tempered Glass Guard for Apple iPhone 5s', 'Supremo Docking Station Accessory Combo for All Smartphones...']

In [4]:

```
print(len(rating_t))
print(rating_t)
```

147

```
['4.7', '4.5', '4.7', '4.5', '4.6', '4.6', '4.5', '4.5', '4.7', '4.7', '4.5', '4.7', '3.4', '4.7', '4.7', '4.5', '4.6', '4.5', '4.5', '4.7', '4.7', '4.6', '4.6', '4.7', '4.5', '4.1', '4.7', '4.5', '4.5', '4.7', '4.7', '4.7', '4.7', '4.7', '5', '5', '4.1', '5', '5', '4.5', '4', '1', '4.5', '5', '5', '5', '4.5', '5', '1', '4.7', '4.7', '4.6', '4.7', '4.7', '4.7', '4.6', '4.7', '4.7', '4.6', '4.6', '4.6', '4.5', '4.5', '4.5', '4.4', '4.5', '4.7', '4.6', '3.9', '3.8', '3.9', '3.7', '4', '3.8', '4.2', '4.2', '3.9', '3.5', '4.6', '5', '5', '3.9', '5', '5', '4.4', '5', '5', '4.5', '5', '5', '4.5', '5', '1', '3.7', '3.6', '3.6', '3.5', '3.5', '3', '3.8', '4.1', '3.7', '4.1', '4.4', '3.1', '4.2', '4', '3.8', '3.7', '1', '3', '4.1', '5', '5', '3.7', '1', '1', '3.1', '1', '1', '3.8', '1', '1', '3.9', '3.6', '3.3', '3.8', '3', '4.3', '3.5', '3.5', '4', '3.9', '5', '5', '3.6', '2', '2', '3.5', '5', '5', '4.5', '5', '1', '3.5', '2', '2']
```

In [5]:

```
print(len(price_t))
print(price_t)
```

180

```
['₹68,300', '₹42,500', '₹68,300', '₹29,499', '₹52,500', '₹52,500', '₹42,500', '₹42,500', '₹73,600', '₹68,300', '₹47,800', '₹73,600', '₹179', '₹1,299', '₹73,600', '₹73,600', '₹47,800', '₹52,500', '₹47,800', '₹1,559', '₹36,999', '₹73,600', '₹68,300', '₹1,299', '₹57,800', '₹57,800', '₹68,300', '₹36,999', '₹199', '₹1,129', '₹62,999', '₹29,900', '₹36,999', '₹599', '₹1,06,600', '₹1,17,100', '₹1,21,300', '₹1,21,300', '₹1,17,100', '₹699', '₹62,999', '₹199', '₹29,900', '₹29,499', '₹36,999', '₹56,999', '₹1,17,100', '₹52,990', '₹1,299', '₹1,40,300', '₹1,17,100', '₹1,06,600', '₹52,990', '₹1,21,300', '₹1,559', '₹1,34,900', '₹67,990', '₹1,299', '₹1,299', '₹67,990', '₹76,000', '₹57,990', '₹57,990', '₹47,490', '₹199', '₹42,990', '₹46,344', '₹1,24,490', '₹199', '₹84,990', '₹199', '₹199', '₹199', '₹197', '₹479', '₹199', '₹149', '₹199', '₹1,129', '₹299', '₹107', '₹179', '₹199', '₹199', '₹599', '₹52,990', '₹199', '₹42,990', '₹47,490', '₹42,500', '₹199', '₹189', '₹119', '₹1,299', '₹349', '₹259', '₹99', '₹189', '₹189', '₹1,559', '₹189', '₹199', '₹199', '₹1,299', '₹199', '₹259', '₹499', '₹179', '₹199', '₹199', '₹259', '₹238', '₹119', '₹199', '₹189', '₹439', '₹259', '₹425', '₹198', '₹479', '₹189', '₹119', '₹238', '₹1,129', '₹238', '₹299', '₹199', '₹201', '₹119', '₹599', '₹199', '₹499', '₹179', '₹425', '₹199', '₹201', '₹299', '₹189', '₹1,299', '₹179', '₹299', '₹179', '₹199', '₹199', '₹1,559', '₹399', '₹199', '₹199', '₹1,299', '₹119', '₹179', '₹179', '₹189', '₹189', '₹199', '₹201', '₹189', '₹201', '₹199', '₹289', '₹179', '₹189', '₹179', '₹259', '₹479', '₹299', '₹179', '₹249', '₹1,129', '₹237', '₹199', '₹119', '₹189', '₹179', '₹599', '₹299', '₹179', '₹299', '₹42,500', '₹289']
```

Zippping the List together in DataFrame

In [6]:

```
for product, rating, price in zip(prod_t, rating_t, price_t):  
    final_array.append({'Products': product, 'Rating': rating, 'Price': price})  
  
df = pd.DataFrame(final_array)
```

In [7]:

```
df.head()
```

Out[7]:

	Products	Rating	Price
0	Apple iPhone 11 (Black, 64 GB)	4.7	₹68,300
1	Apple iPhone SE (Black, 64 GB)	4.5	₹42,500
2	Apple iPhone 11 (White, 64 GB)	4.7	₹68,300
3	Apple iPhone 7 (Black, 32 GB)	4.5	₹29,499
4	Apple iPhone XR (White, 64 GB)	4.6	₹52,500

Removing "₹" and "," from Price Column in order to change it into numeric Data type from string data type

In [8]:

```
df['Price'] = df['Price'].str.lstrip('₹')  
df['Price'] = df['Price'].replace({' ',':'}, regex=True)  
  
df.head()
```

Out[8]:

	Products	Rating	Price
0	Apple iPhone 11 (Black, 64 GB)	4.7	68300
1	Apple iPhone SE (Black, 64 GB)	4.5	42500
2	Apple iPhone 11 (White, 64 GB)	4.7	68300
3	Apple iPhone 7 (Black, 32 GB)	4.5	29499
4	Apple iPhone XR (White, 64 GB)	4.6	52500

Rating and Price converted into float datatype in order to perform mathematical operations on the feature

In [10]:

```
df['Rating'] = df['Rating'].astype(np.float)
df['Price'] = pd.to_numeric(df['Price'], errors='coerce')
```

In [12]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 147 entries, 0 to 146
Data columns (total 3 columns):
Products      147 non-null object
Rating        147 non-null float64
Price         147 non-null int64
dtypes: float64(1), int64(1), object(1)
memory usage: 2.9+ KB
```

In [14]:

```
df.head()
```

Out[14]:

	Products	Rating	Price
0	Apple iPhone 11 (Black, 64 GB)	4.7	68300
1	Apple iPhone SE (Black, 64 GB)	4.5	42500
2	Apple iPhone 11 (White, 64 GB)	4.7	68300
3	Apple iPhone 7 (Black, 32 GB)	4.5	29499
4	Apple iPhone XR (White, 64 GB)	4.6	52500

Saving the Dataframe into csv file

In [15]:

```
df.to_csv('iphone.csv')
```

In [17]:

```
df.tail()
```

Out[17]:

	Products	Rating	Price
142	Snooky Camera Lens Protector for Apple iPhone 6	5.0	199
143	Ravbelli Edge To Edge Tempered Glass for Apple...	1.0	199
144	Richuzers Edge To Edge Tempered Glass for Appl...	3.5	1559
145	SHIELD Tempered Glass Guard for Apple iPhone 7	2.0	399
146	SHIELD Tempered Glass Guard for Apple iPhone SE	2.0	199

In [18]:

```
df.describe()
```

Out[18]:

	Rating	Price
count	147.000000	147.000000
mean	4.036054	27405.816327
std	1.075821	38114.882909
min	1.000000	99.000000
25%	3.700000	199.000000
50%	4.500000	1129.000000
75%	4.700000	52500.000000
max	5.000000	140300.000000

My Budget is 35000 - 45000

Subsetting the Dataset with Price grater or equal to 35000

In [19]:

```
new_df=df[(df['Price'] >= 35000)]
```

In [455]:

```
new_df
```

Out[455]:

	Products	Rating	Price
0	Apple iPhone 11 (Black, 64 GB)	4.7	68300
1	Apple iPhone SE (Black, 64 GB)	4.5	42500
2	Apple iPhone 11 (White, 64 GB)	4.7	68300
5	Apple iPhone XR (Black, 64 GB)	4.6	52500
6	Apple iPhone XR (White, 64 GB)	4.5	52500
7	Apple iPhone SE (White, 64 GB)	4.7	42500
8	Apple iPhone 11 (Black, 128 GB)	4.7	73600
9	Apple iPhone 11 (White, 128 GB)	4.7	73600
10	Apple iPhone 11 (Green, 64 GB)	4.5	68300
11	Apple iPhone SE (Red, 64 GB)	4.7	42500
12	Apple iPhone 11 (Purple, 128 GB)	3.4	73600
15	Apple iPhone SE (Black, 128 GB)	4.5	47800
16	Apple iPhone 11 (Green, 128 GB)	4.5	73600
17	Apple iPhone SE (Red, 128 GB)	4.6	47800
18	Apple iPhone SE (White, 128 GB)	4.7	47800
20	Apple iPhone XR (Coral, 64 GB)	4.7	52500
21	Apple iPhone 11 (Purple, 64 GB)	4.6	68300
22	Apple iPhone 7 Plus (Black, 32 GB)	4.7	36999
24	Apple iPhone 11 (Red, 128 GB)	4.5	73600
25	Apple iPhone XR (Black, 128 GB)	4.2	57800
26	Apple iPhone 11 (Red, 64 GB)	4.5	68300
27	Apple iPhone XR (Blue, 128 GB)	4.7	57800
31	Apple iPhone 7 Plus (Gold, 32 GB)	4.7	36999
32	Apple iPhone XS (Space Grey, 64 GB)	4.7	62999
34	Apple iPhone 7 Plus (Rose Gold, 32 GB)	4.7	36999
35	Apple iPhone 11 Pro (Space Grey, 256 GB)	5.0	121300
36	Apple iPhone 11 Pro (Silver, 64 GB)	5.0	106600
37	Apple iPhone 11 Pro Max (Midnight Green, 256 GB)	4.7	131900
38	Apple iPhone 11 Pro (Midnight Green, 64 GB)	5.0	106600
40	Apple iPhone 11 Pro (Silver, 256 GB)	4.2	62999
41	Apple iPhone 11 Pro Max (Silver, 64 GB)	5.0	131900
45	Apple iPhone 11 Pro (Silver, 512 GB)	3.0	121300
46	Apple iPhone 11 Pro Max (Midnight Green, 64 GB)	4.5	117100
47	Apple iPhone 11 Pro (Space Grey, 64 GB)	4.0	39899
49	Mopcollections Camera Lens Protector for Apple...	4.7	56999
50	Apple iPhone 8 (Gold, 64 GB)	4.7	140300
51	Apple iPhone 8 Plus (Space Grey, 64 GB)	4.5	117100

	Products	Rating	Price
52	Apple iPhone 8 Plus (Silver, 256 GB)	4.7	106600
53	Mopcollections Camera Lens Protector for Apple...	4.7	121300
55	Apple iPhone XS (Space Grey, 512 GB)	4.7	38999
56	Apple iPhone 8 Plus (Gold, 256 GB)	4.7	52990
57	Apple iPhone 8 (Gold, 256 GB)	4.5	67990
60	Apple iPhone 8 (Silver, 256 GB)	4.1	134900
61	Apple iPhone 7 (Rose Gold, 256 GB)	4.7	67990
62	Apple iPhone 6s Plus (Space Grey, 16 GB)	4.6	57990
63	Mopcollections Camera Lens Protector for Apple...	4.5	76000
65	Apple iPhone XS (Silver, 512 GB)	4.5	57990
66	Dainty Tempered Glass Guard for Apple iPhone S...	4.5	47490
67	Apple iPhone X (Silver, 256 GB)	4.4	42990
69	Lezix Edge To Edge Tempered Glass for Apple iP...	4.7	46393
70	BlackBug Back Screen Guard for Apple iPhone 5s	3.9	124490
72	Bodoma Back Screen Guard for Apple Iphone 11	3.8	84990
87	Power Tempered Glass Guard for Apple iPhone SE	5.0	42990
88	Power Tempered Glass Guard for Apple iPhone SE	4.5	42500
134	Power Tempered Glass Guard for Apple iPhone SE	3.0	42500

Sorting Price and Rating of the Product and selecting top 8 product and storing it on new Variable

In [20]:

```
new_df = new_df.sort_values(["Price", "Rating"], ascending = (True, True))  
selection=new_df.head(8)
```

In [21]:

selection

Out[21]:

	Products	Rating	Price
27	Apple iPhone 7 Plus (Gold, 32 GB)	4.5	36999
20	Apple iPhone 7 Plus (Black, 32 GB)	4.7	36999
32	Apple iPhone 7 Plus (Rose Gold, 32 GB)	4.7	36999
44	Apple iPhone 11 Pro (Silver, 512 GB)	5.0	36999
1	Apple iPhone SE (Black, 64 GB)	4.5	42500
6	Apple iPhone SE (White, 64 GB)	4.5	42500
7	Apple iPhone SE (Red, 64 GB)	4.5	42500
89	Raptas Case Accessory Combo for All Smartphone...	5.0	42500

In [23]:

import matplotlib.pyplot as plt

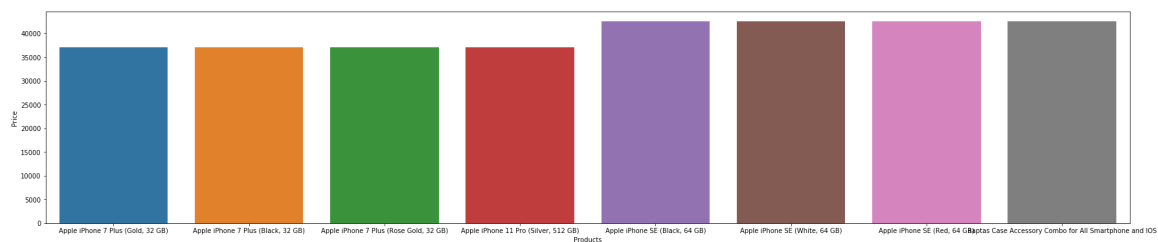
Visualizing the data using Product Vs Price

In [24]:

```
plt.figure(figsize=(30,6))
sns.barplot(x=selection['Products'], y=selection['Price'])
```

Out[24]:

<matplotlib.axes._subplots.AxesSubplot at 0x11575630>



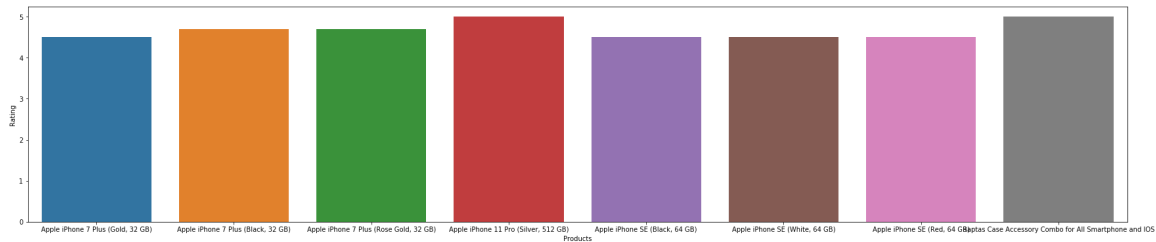
Visualizing the data using Product Vs Rating

In [25]:

```
plt.figure(figsize=(30,6))  
sns.barplot(x=selection['Products'], y=selection['Rating'])
```

Out[25]:

<matplotlib.axes._subplots.AxesSubplot at 0x11744330>



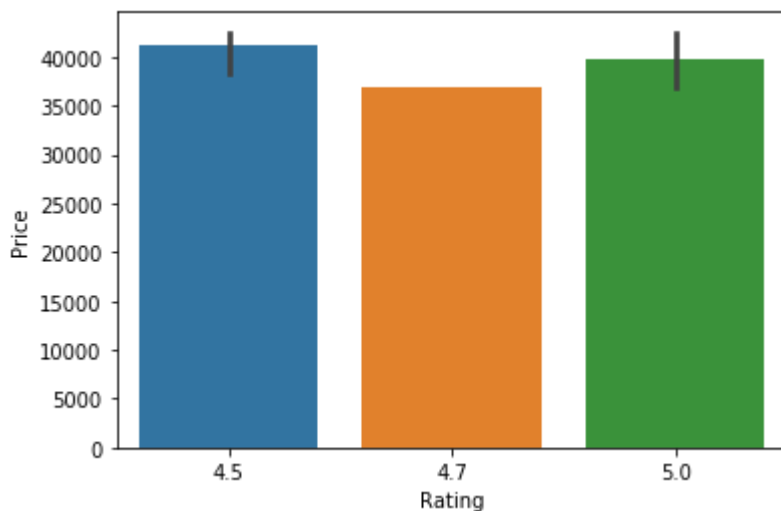
Visulalizing the data using Rating Vs Price

In [26]:

```
import seaborn as sns  
  
sns.barplot(x=selection['Rating'], y=selection['Price'])
```

Out[26]:

<matplotlib.axes._subplots.AxesSubplot at 0x42dd7d0>



Selecting best Product as per budget and Rating

In [29]:

```
selection[(selection['Price'] >= 35000) & (selection['Price'] <= 45000) & (selection['Rating'] >= 4.7)]
```

Out[29]:

	Products	Rating	Price
20	Apple iPhone 7 Plus (Black, 32 GB)	4.7	36999
32	Apple iPhone 7 Plus (Rose Gold, 32 GB)	4.7	36999
44	Apple iPhone 11 Pro (Silver, 512 GB)	5.0	36999
89	Raptas Case Accessory Combo for All Smartphone...	5.0	42500

In []: