PROJECT ON IPHONE SALES

In [38]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import plotly. express as px
import plotly.graph_objects as go
import os
os.chdir("D:\data science default")
```

In [71]:
```
iphone= pd.read_csv("apple.csv")
iphone
```

Out[71]:

	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating	Ra
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	(
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	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	(
3	APPLE iPhone 8 (Silver, 256 GB)	https://www.flipkart.com/apple-iphone-8-silver...	Apple	77000	77000	0	11202	794	MOBEXRGVMZWUHCBA	4.5	(
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	(
...	...	...	...	...	...	...	...	...	...	...	
57	APPLE iPhone SE (Black, 64 GB)	https://www.flipkart.com/apple-iphone-se-black...	Apple	29999	39900	24	95909	8161	MOBFWQ6BR3MK7AUG	4.5	(
58	APPLE iPhone 11 (Purple, 64 GB)	https://www.flipkart.com/apple-iphone-11-purpl...	Apple	46999	54900	14	43470	3331	MOBFWQ6BTFFJKGKE	4.6	(
59	APPLE iPhone 11 (White, 64 GB)	https://www.flipkart.com/apple-iphone-11-white...	Apple	46999	54900	14	43470	3331	MOBFWQ6BVWVEH3XE	4.6	(
60	APPLE iPhone 11 (Black, 64 GB)	https://www.flipkart.com/apple-iphone-11-black...	Apple	46999	54900	14	43470	3331	MOBFWQ6BXGJCEYNY	4.6	(
61	APPLE iPhone 11 (Red, 64 GB)	https://www.flipkart.com/apple-iphone-11-red-6...	Apple	46999	54900	14	43470	3331	MOBFWQ6BYYV3FCU7	4.6	(

62 rows × 11 columns

In [8]:
```
iphone.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 [ ]:

In [ ]:

In [ ]:

In [ ]:
```
# checking the null values
```

In [12]:
```
iphone.isnull().sum()
```

Out[12]:
```
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 [13]:
```
# there is no null value in the dataset
```

In [ ]:
```
# checking the duplicate value in the dataset
```

In [15]:
```
iphone.duplicated().sum()
```

Out[15]:
```
0
```

In [ ]:
```
 # stat analysis
```

In [16]:
```
iphone.describe()
```

Out[16]:

	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

In [ ]:
```
# Q1 top 10 most rated iphone on flipkart
```

In [21]:
```
highest_rate= iphone.sort_values(by=["Star Rating"],ascending=False)
highest_rate
```

Out[21]:

	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating
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	MOBFKCTSRYPAQNYT	4.7
17	APPLE iPhone 11 Pro Max (Space Grey, 64 GB)	https://www.flipkart.com/apple-iphone-11-pro-m...	Apple	117100	117100	0	1078	101	MOBFKCTSKDMKCGQS	4.7
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	MOBFKCTSCAAKGQV7	4.7
15	APPLE iPhone 11 Pro Max (Gold, 64 GB)	https://www.flipkart.com/apple-iphone-11-pro-m...	Apple	117100	117100	0	1078	101	MOBFKCTSAPAYNSGG	4.7
14	APPLE iPhone 11 Pro Max (Gold, 256 GB)	https://www.flipkart.com/apple-iphone-11-pro-m...	Apple	131900	131900	0	1078	101	MOBFKCTS7HCHSPFH	4.7
...	...	...	...	...	...	...	...	...	...	...
45	APPLE iPhone 12 Mini (Black, 64 GB)	https://www.flipkart.com/apple-iphone-12-mini-...	Apple	59900	69900	14	740	64	MOBFWBYZXSEGBS6F	4.5
28	APPLE iPhone 12 Mini (White, 64 GB)	https://www.flipkart.com/apple-iphone-12-mini-...	Apple	59900	69900	14	740	64	MOBFWBYZBH4CEC4C	4.5
23	Apple iPhone SE (White, 256 GB) (Includes EarP...	https://www.flipkart.com/apple-iphone-se-white...	Apple	44999	54900	18	95909	8161	MOBFRFXHPZCHAPEH	4.5
41	APPLE iPhone 12 Pro (Pacific Blue, 512 GB)	https://www.flipkart.com/apple-iphone-12-pro-p...	Apple	140900	149900	6	545	42	MOBFWBYZTHSXKMGW	4.5
27	APPLE iPhone 12 Pro (Graphite, 256 GB)	https://www.flipkart.com/apple-iphone-12-pro-g...	Apple	120900	129900	6	545	42	MOBFWBYZBA36UB7G	4.5

62 rows × 11 columns

In [59]:
```
highest_rate.head(10)
```

Out[59]:

	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating
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	MOBFKCTSRYPAQNYT	4.7
17	APPLE iPhone 11 Pro Max (Space Grey, 64 GB)	https://www.flipkart.com/apple-iphone-11-pro-m...	Apple	117100	117100	0	1078	101	MOBFKCTSKDMKCGQS	4.7
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	MOBFKCTSCAAKGQV7	4.7
15	APPLE iPhone 11 Pro Max (Gold, 64 GB)	https://www.flipkart.com/apple-iphone-11-pro-m...	Apple	117100	117100	0	1078	101	MOBFKCTSAPAYNSGG	4.7
14	APPLE iPhone 11 Pro Max (Gold, 256 GB)	https://www.flipkart.com/apple-iphone-11-pro-m...	Apple	131900	131900	0	1078	101	MOBFKCTS7HCHSPFH	4.7
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
29	APPLE iPhone 12 (White, 128 GB)	https://www.flipkart.com/apple-iphone-12-white...	Apple	75900	84900	10	2101	180	MOBFWBYZBTZFGJF9	4.6
32	APPLE iPhone 12 Pro Max (Graphite, 128 GB)	https://www.flipkart.com/apple-iphone-12-pro-m...	Apple	120900	129900	6	580	45	MOBFWBYZFDGQSDWS	4.6
35	APPLE iPhone 12 (Black, 128 GB)	https://www.flipkart.com/apple-iphone-12-black...	Apple	75900	84900	10	2101	180	MOBFWBYZK3HACR72	4.6
36	APPLE iPhone 12 (Blue, 128 GB)	https://www.flipkart.com/apple-iphone-12-blue-...	Apple	75900	84900	10	2101	180	MOBFWBYZKPTZF9VG	4.6

In [ ]:

In [ ]:

In [25]:
```
print(highest_rate["Product Name"])
```

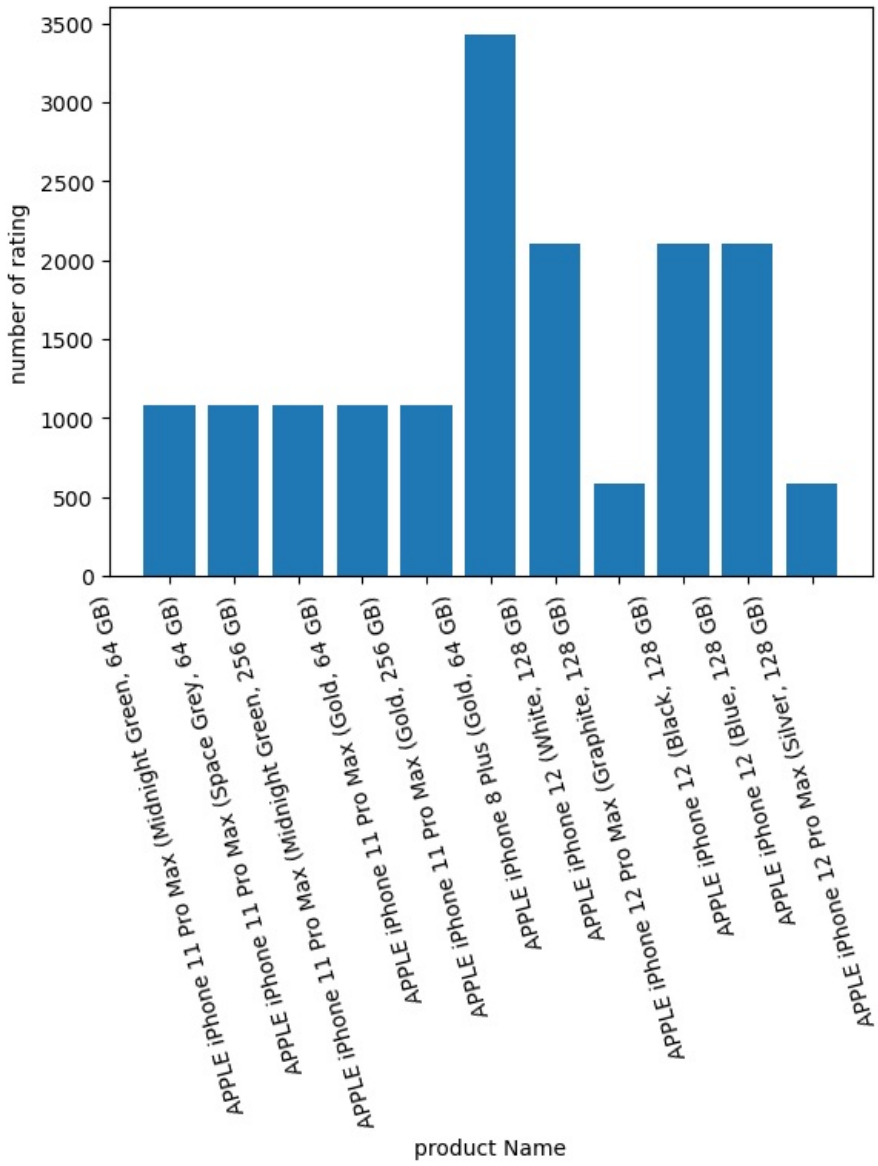
```
20      APPLE iPhone 11 Pro Max (Midnight Green, 64 GB)
17          APPLE iPhone 11 Pro Max (Space Grey, 64 GB)
16     APPLE iPhone 11 Pro Max (Midnight Green, 256 GB)
15                APPLE iPhone 11 Pro Max (Gold, 64 GB)
14               APPLE iPhone 11 Pro Max (Gold, 256 GB)
                           ...
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
```

In [27]:
```
print(highest_rate)
```

```
                                    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)

                                    Product URL  Brand  Sale Price  \
20  https://www.flipkart.com/apple-iphone-11-pro-m...  Apple      117100
17  https://www.flipkart.com/apple-iphone-11-pro-m...  Apple      117100
16  https://www.flipkart.com/apple-iphone-11-pro-m...  Apple      131900
15  https://www.flipkart.com/apple-iphone-11-pro-m...  Apple      117100
14  https://www.flipkart.com/apple-iphone-11-pro-m...  Apple      131900
..                                                ...    ...         ...
45  https://www.flipkart.com/apple-iphone-12-mini-...  Apple       59900
28  https://www.flipkart.com/apple-iphone-12-mini-...  Apple       59900
23  https://www.flipkart.com/apple-iphone-se-white...  Apple       44999
41  https://www.flipkart.com/apple-iphone-12-pro-p...  Apple      140900
27  https://www.flipkart.com/apple-iphone-12-pro-g...  Apple      120900

       Mrp  Discount Percentage  Number Of Ratings  Number Of Reviews  \
20  117100                    0               1078                101
17  117100                    0               1078                101
16  131900                    0               1078                101
15  117100                    0               1078                101
14  131900                    0               1078                101
..     ...                  ...                ...                ...
45   69900                   14                740                 64
28   69900                   14                740                 64
23   54900                   18              95909               8161
41  149900                    6                545                 42
27  129900                    6                545                 42

                Upc  Star Rating   Ram
20  MOBFKCTSRYPAQNYT          4.7  4 GB
17  MOBFKCTSKDMKCGQS          4.7  4 GB
16  MOBFKCTSCAAKGQV7          4.7  4 GB
15  MOBFKCTSAPAYNSGG          4.7  4 GB
14  MOBFKCTS7HCHSPFH          4.7  4 GB
..               ...          ...   ...
45  MOBFWBYZXSEGBS6F          4.5  4 GB
28  MOBFWBYZBH4CEC4C          4.5  4 GB
23  MOBFRFXHPZCHAPEH          4.5  2 GB
41  MOBFWBYZTHSXKMGW          4.5  4 GB
27  MOBFWBYZBA36UB7G          4.5  6 GB

[62 rows x 11 columns]
```

In [28]:
```
# how many ratings  do the righest- rated iphone on flipkart have
```

In [40]:
```
plt.bar(highest_rate["Product Name"][0:11], highest_rate["Number Of Ratings"][0:11])
plt.ylabel("number of rating")
plt.xlabel("product Name")
plt.xticks(rotation=105)
plt.show()
```



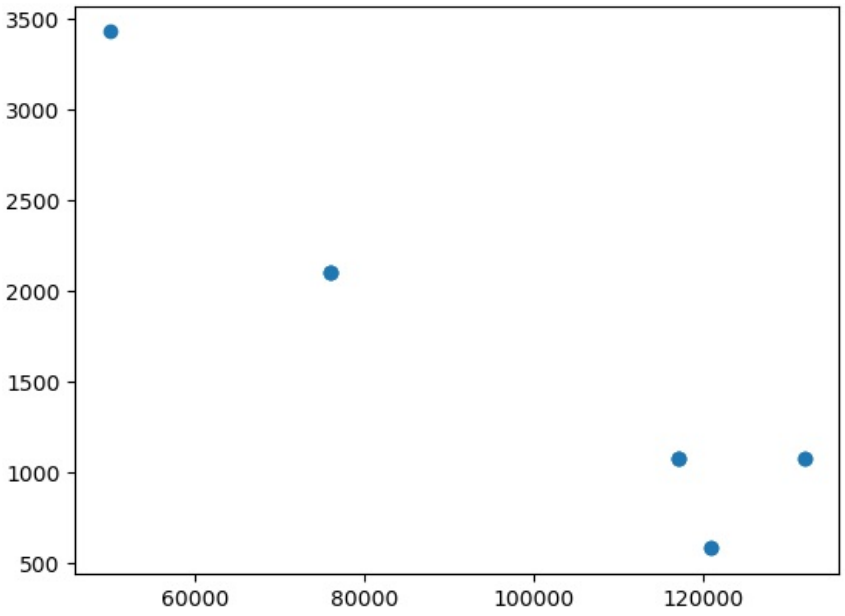
In [ ]:
```
# highest number of review
```

In [ ]:
```
```

In [50]:
```
iphones= highest_rate["Product Name"].value_counts()
label= iphones.index[0:11]
counts= highest_rate["Number Of Reviews"][0:11]
figure= px.bar(highest_rate, x=label, y= counts, title="Number of highest reviewe rated iphones")
figure.show()
```

In [64]:
```
plt.scatter(highest_rate["Sale Price"][0:11], highest_rate["Number Of Ratings"][0:11])
```

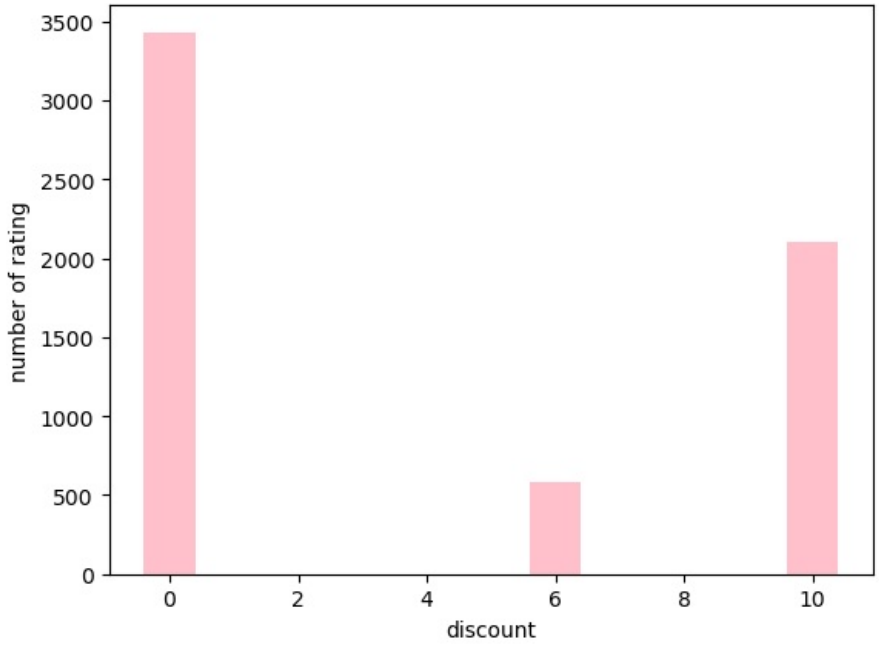
Out[64]:
```
<matplotlib.collections.PathCollection at 0x12fcd789450>
```



In [ ]:
```
# relationship between discount percentage and number  of review
```

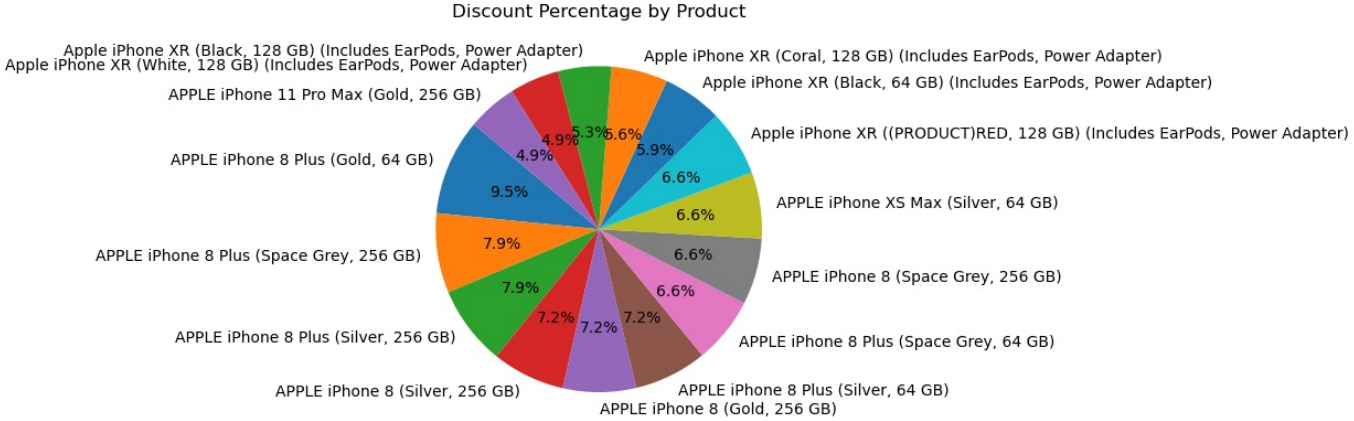
In [109…
```
plt.bar(highest_rate["Discount Percentage"][0:10], highest_rate["Number Of Ratings"][0:10], color= "pink")
plt.xlabel("discount")
plt.ylabel("number of rating")
```

Out[109…
```
Text(0, 0.5, 'number of rating')
```



In [ ]:
```
# which product have highest discount top 10
```

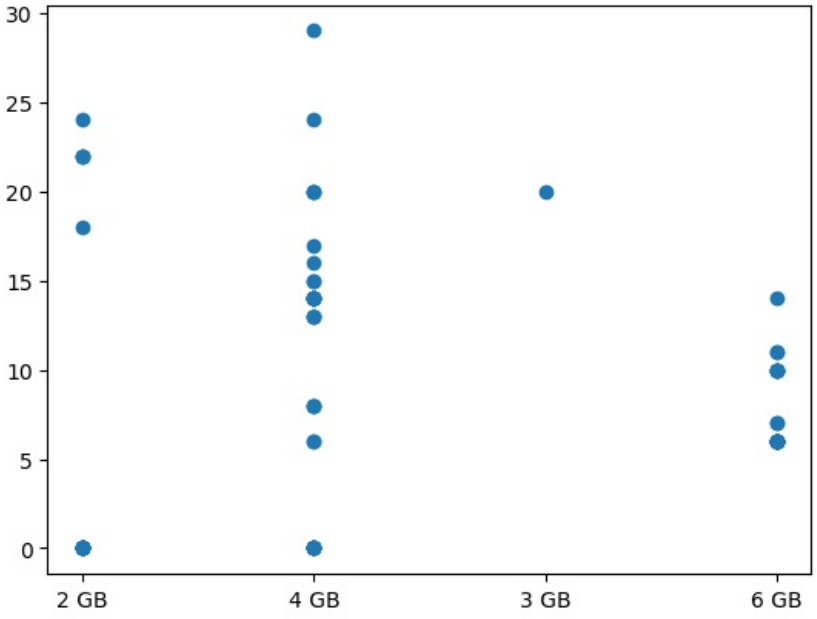
In [103…
```
import pandas as pd
import matplotlib.pyplot as plt

# Load the CSV file into a DataFrame
iphone = pd.read_csv("apple.csv")
y= iphone["Discount Percentage"].sort_values(ascending=False)[0:15]
# Create the pie chart with adjusted startangle
plt.pie(y
    ,
    labels=iphone["Product Name"][0:15],
    autopct='%1.1f%%',
    startangle=140  # Adjust this angle as needed
)

plt.title("Discount Percentage by Product")
plt.show()
```



In [ ]:
```
# which ram get highest number of discount
```

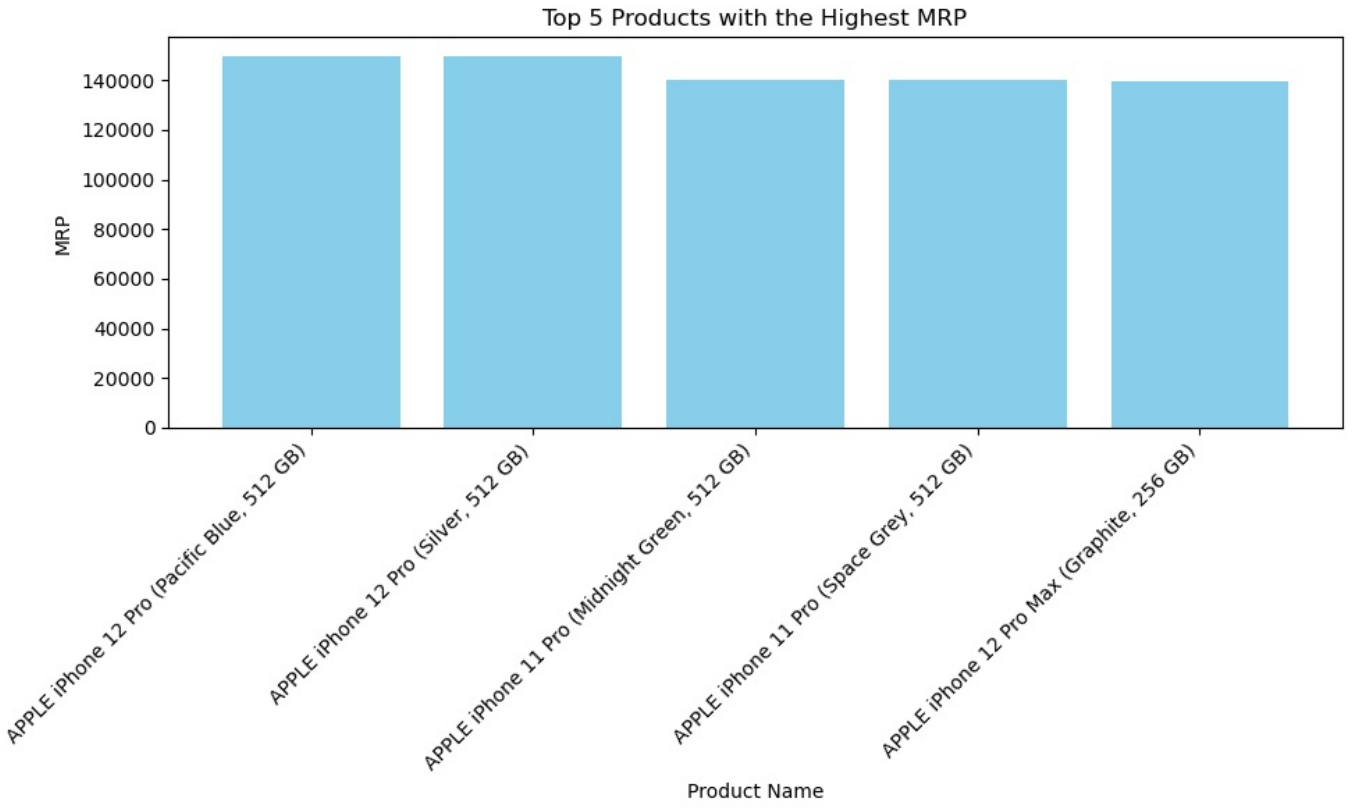
In [105…
```
plt.scatter(iphone["Ram"], iphone["Discount Percentage"])
```

Out[105… <matplotlib.collections.PathCollection at 0x12fd27b0410>



In [ ]:
```
# which phone have the highest mrp top 5
```

In [114…
```
import pandas as pd
import matplotlib.pyplot as plt

# Load the CSV file into a DataFrame
iphone = pd.read_csv("apple.csv")

# Sort the DataFrame by MRP in descending order and select the top 5 rows
top5_products = iphone.sort_values(by="Mrp", ascending=False).head(5)

# Create a bar chart
plt.figure(figsize=(10, 6))
plt.bar(top5_products["Product Name"], top5_products["Mrp"], color='skyblue')

# Add labels and title
plt.xlabel("Product Name")
plt.ylabel("MRP")
plt.title("Top 5 Products with the Highest MRP")
plt.xticks(rotation=45, ha='right')  # Rotate labels for better readability

# Show the plot
plt.tight_layout()  # Adjust layout to make room for label rotation
plt.show()
```



In [ ]: