#iPhone Sales Analysis

Cell 1: Import Libraries

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from google.colab import files
```

Cell 2: Upload CSV File and Load Data

```
# Upload the CSV file
uploaded = files.upload()

# Load the uploaded file into a DataFrame
file_name = next(iter(uploaded))  # Get the name of the uploaded file
data = pd.read_csv(file_name)
print("CSV file loaded successfully!")
print(data.head())
```

```
<IPython.core.display.HTML object>

Saving apple_products.csv to apple_products.csv
CSV file loaded successfully!
                                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)

                                         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

     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

                 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
```

Cell 3: Analyze Data

```
# Check if data is loaded
if 'data' in globals():
    print(data.isnull().sum())
    print(data.describe())
else:
    print("Please upload the CSV file first.")
```

```
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
          Sale Price            Mrp  Discount Percentage  Number Of
Ratings  \
count      62.000000      62.000000            62.000000
62.000000
mean    80073.887097   88058.064516             9.951613
22420.403226
std     34310.446132   34728.825597             7.608079
33768.589550
min     29999.000000   39900.000000             0.000000
542.000000
25%     49900.000000   54900.000000             6.000000
740.000000
50%     75900.000000   79900.000000            10.000000
2101.000000
75%    117100.000000  120950.000000            14.000000
43470.000000
max    140900.000000  149900.000000            29.000000
95909.000000
```

```
       Number Of Reviews  Star Rating
count          62.000000    62.000000
mean         1861.677419     4.575806
std          2855.883830     0.059190
min            42.000000     4.500000
25%            64.000000     4.500000
50%           180.000000     4.600000
75%          3331.000000     4.600000
max          8161.000000     4.700000
```

Cell 4: Highest Rated Products

```
if 'data' in globals():
    highest_rated = data.sort_values(by=["Star Rating"],
ascending=False).head(10)
    print(highest_rated['Product Name'])
    print(highest_rated)
else:
    print("Please upload the CSV file first.")
```

```
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)
0                    APPLE iPhone 8 Plus (Gold, 64 GB)
29                     APPLE iPhone 12 (White, 128 GB)
32          APPLE iPhone 12 Pro Max (Graphite, 128 GB)
35                     APPLE iPhone 12 (Black, 128 GB)
36                      APPLE iPhone 12 (Blue, 128 GB)
Name: Product Name, dtype: object
                                          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)
0                  APPLE iPhone 8 Plus (Gold, 64 GB)
29                   APPLE iPhone 12 (White, 128 GB)
32        APPLE iPhone 12 Pro Max (Graphite, 128 GB)
35                   APPLE iPhone 12 (Black, 128 GB)
36                    APPLE iPhone 12 (Blue, 128 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
0   https://www.flipkart.com/apple-iphone-8-plus-g...  Apple
49900
29  https://www.flipkart.com/apple-iphone-12-white...  Apple
75900
32  https://www.flipkart.com/apple-iphone-12-pro-m...  Apple
120900
35  https://www.flipkart.com/apple-iphone-12-black...  Apple
75900
36  https://www.flipkart.com/apple-iphone-12-blue-...  Apple
75900

       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

0    49900                    0               3431                356

29   84900                   10               2101                180

32  129900                    6                580                 45

35   84900                   10               2101                180

36   84900                   10               2101                180


                  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
0   MOBEXRGV7EHHTGUH          4.6  2 GB
29  MOBFWBYZBTZFGJF9          4.6  6 GB
32  MOBFWBYZFDGQSDWS          4.6  6 GB
```

```
35  MOBFWBYZK3HACR72           4.6  6 GB
36  MOBFWBYZKPTZF9VG           4.6  6 GB
```

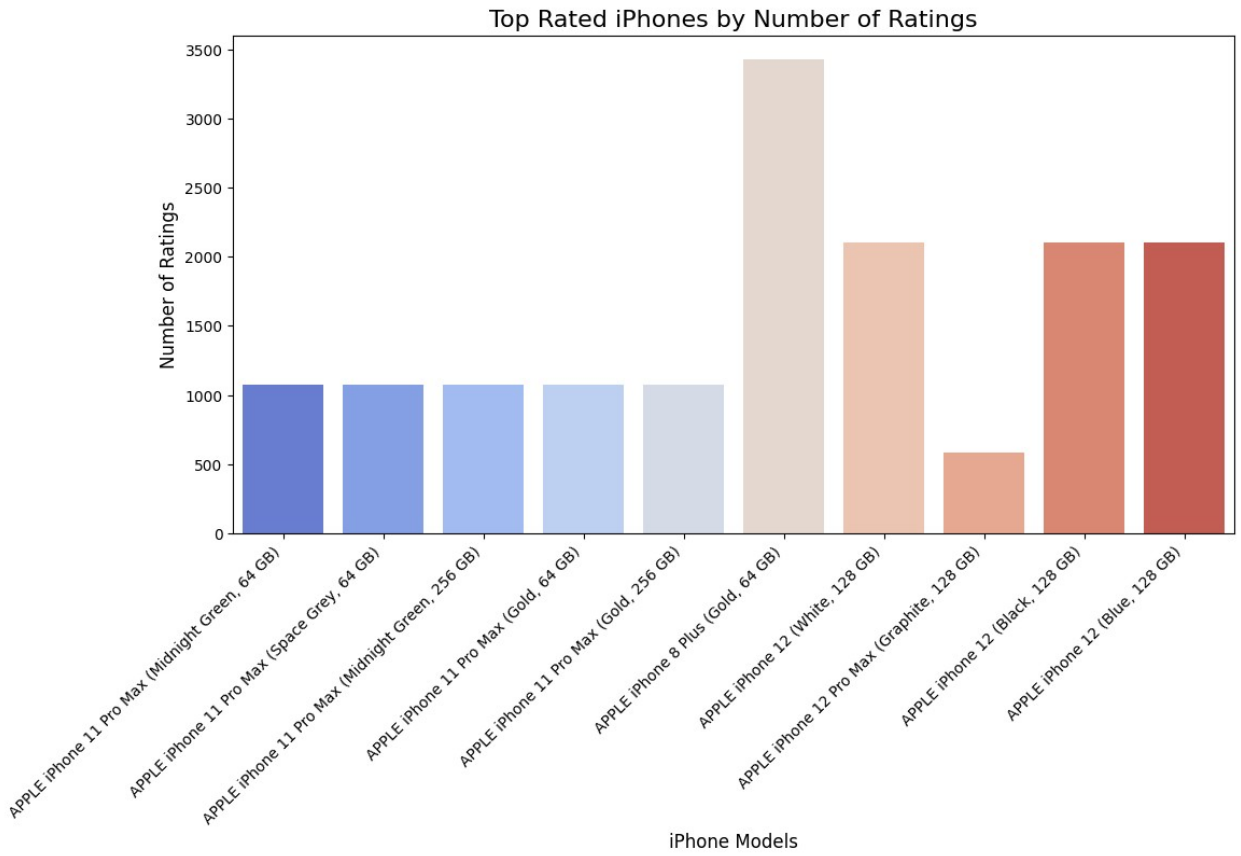
Cell 5: Bar Plot - Top Rated iPhones by Number of Ratings

```
if 'data' in globals():
    plt.figure(figsize=(12, 6))
    sns.barplot(
        x=highest_rated["Product Name"],
        y=highest_rated["Number Of Ratings"],
        palette="coolwarm"  # Updated color palette
    )
    plt.xticks(rotation=45, ha='right')
    plt.title("Top Rated iPhones by Number of Ratings", fontsize=16)
    plt.xlabel("iPhone Models", fontsize=12)
    plt.ylabel("Number of Ratings", fontsize=12)
    plt.show()
else:
    print("Please upload the CSV file first.")
```

```
<ipython-input-15-bc63ddd8bd45>:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `x` variable to `hue` and set
`legend=False` for the same effect.

  sns.barplot(
```



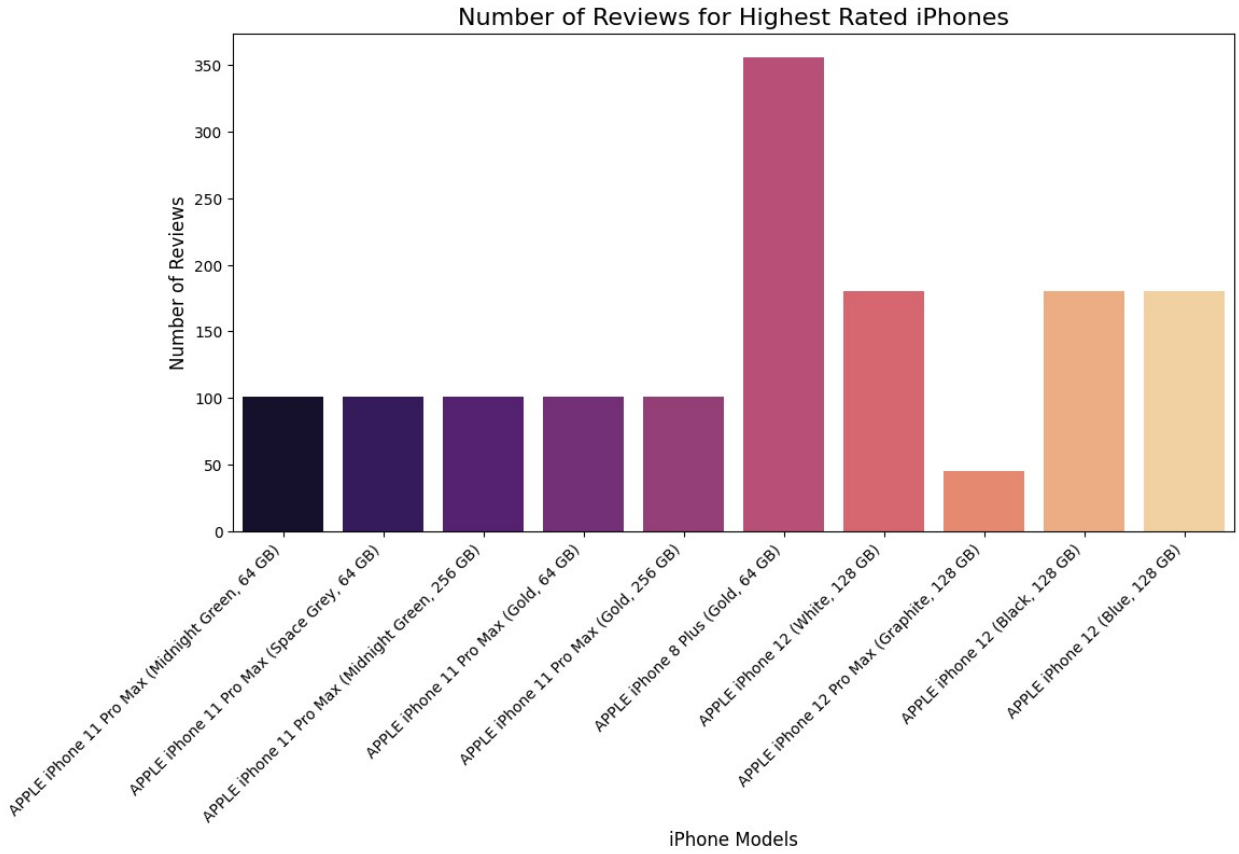
Cell 6: Bar Plot - Number of Reviews for Highest Rated iPhones

```
if 'data' in globals():
    plt.figure(figsize=(12, 6))
    sns.barplot(
        x=highest_rated["Product Name"],
        y=highest_rated["Number Of Reviews"],
        palette="magma"  # Updated color palette
    )
    plt.xticks(rotation=45, ha='right')
    plt.title("Number of Reviews for Highest Rated iPhones",
fontsize=16)
    plt.xlabel("iPhone Models", fontsize=12)
    plt.ylabel("Number of Reviews", fontsize=12)
    plt.show()
else:
    print("Please upload the CSV file first.")
```

```
<ipython-input-16-d9489c2e0520>:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `x` variable to `hue` and set
`legend=False` for the same effect.
```

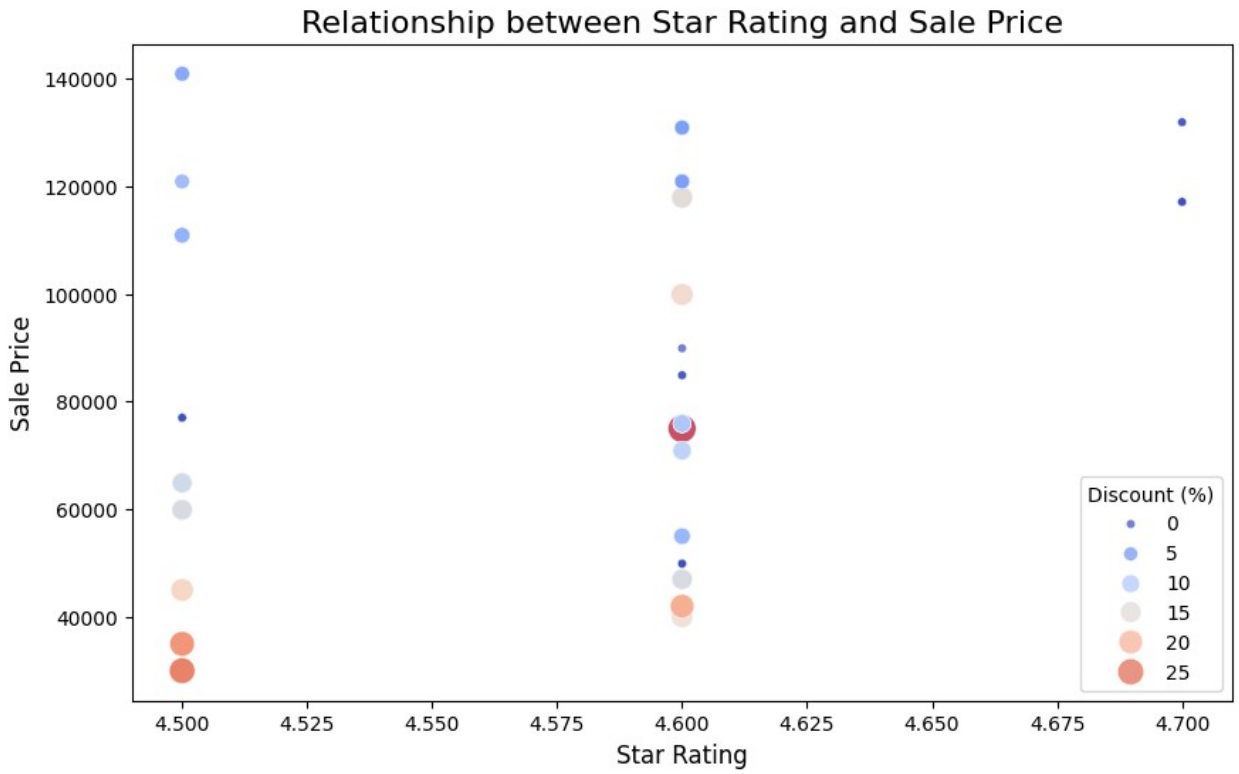
```
  sns.barplot(
```



Cell 7: Scatter Plot - Relationship between Star Rating and Sale Price

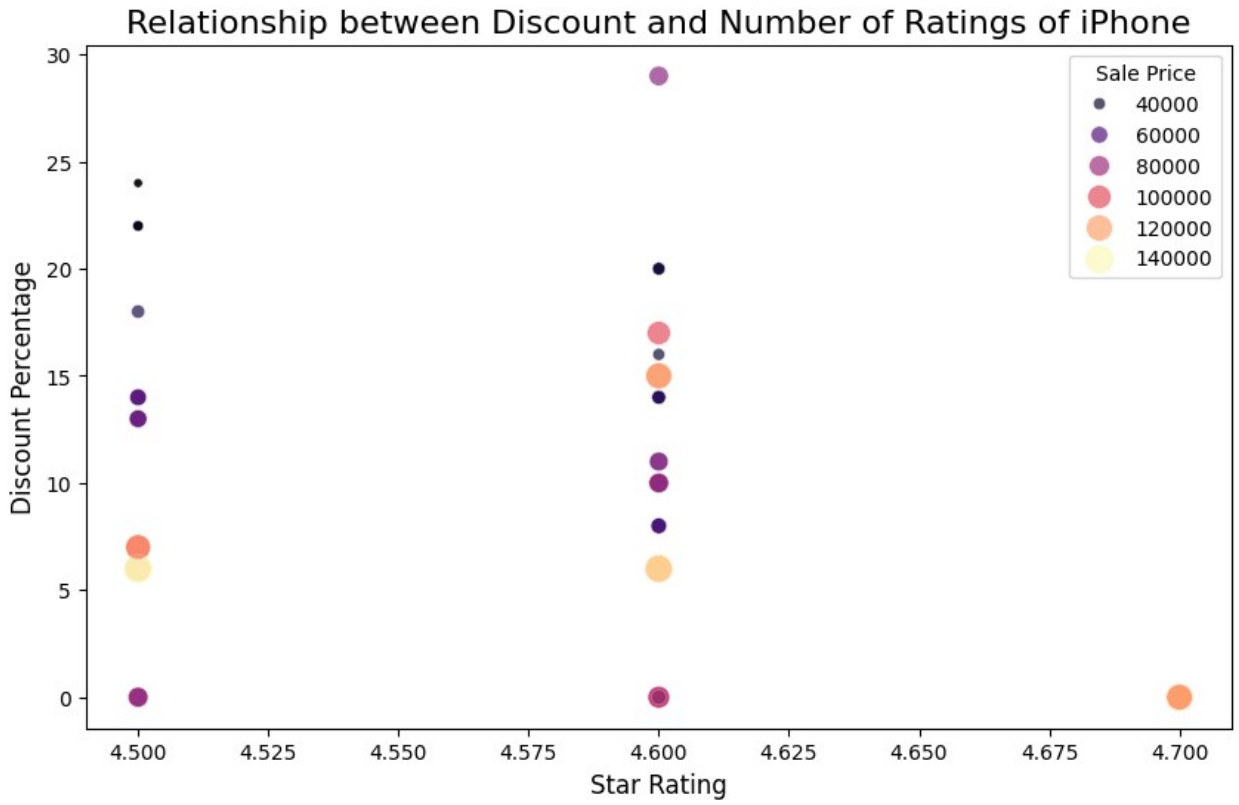
```
if 'data' in globals():
    plt.figure(figsize=(10, 6))
    sns.scatterplot(
        data=data,
        x="Star Rating",
        y="Sale Price",
        size="Discount Percentage",
        hue="Discount Percentage",
        palette="coolwarm",  # Updated color palette
        sizes=(20, 200),
        alpha=0.7
    )
    plt.title("Relationship between Star Rating and Sale Price",
fontsize=16)
    plt.xlabel("Star Rating", fontsize=12)
    plt.ylabel("Sale Price", fontsize=12)
    plt.legend(title="Discount (%)")
    plt.show()
```

```
else:
    print("Please upload the CSV file first.")
```



Cell 8: Scatter Plot - Relationship between Discount and Number of Ratings

```
if 'data' in globals():
    plt.figure(figsize=(10, 6))
    sns.scatterplot(
        data=data,
        x="Star Rating",
        y="Discount Percentage",
        size="Sale Price",
        hue="Sale Price",
        palette="magma",  # Updated color palette
        sizes=(20, 200),
        alpha=0.7
    )
    plt.title("Relationship between Discount and Number of Ratings of
iPhone", fontsize=16)
    plt.xlabel("Star Rating", fontsize=12)
    plt.ylabel("Discount Percentage", fontsize=12)
    plt.legend(title="Sale Price")
    plt.show()
else:
    print("Please upload the CSV file first.")
```



Cell 9: Find the Most and Least Expensive Products

```
if 'data' in globals():
    most_expensive = data.loc[data['Sale Price'].idxmax()]
    least_expensive = data.loc[data['Sale Price'].idxmin()]

    print("Most Expensive Product:")
    print(most_expensive)
    print("\nLeast Expensive Product:")
    print(least_expensive)
else:
    print("Please upload the CSV file first.")
```

```
Most Expensive Product:
Product Name                          APPLE iPhone 12 Pro (Silver, 512
GB)
Product URL             https://www.flipkart.com/apple-iphone-12-pro-
s...
Brand
Apple
Sale Price
140900
Mrp
149900
Discount Percentage
```

```
6
Number Of Ratings
542
Number Of Reviews
42
Upc
MOBFWBYZ5UY6ZBVA
Star Rating
4.5
Ram                                                                    4
GB
Name: 24, dtype: object

Least Expensive Product:
Product Name                                  APPLE iPhone SE (White, 64
GB)
Product URL            https://www.flipkart.com/apple-iphone-se-
white...
Brand
Apple
Sale Price
29999
Mrp
39900
Discount Percentage
24
Number Of Ratings
95807
Number Of Reviews
8154
Upc
MOBFWQ6BGWDVGF3E
Star Rating
4.5
Ram                                                                    2
GB
Name: 52, dtype: object
```