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


data = pd.read_csv('/content/apple_products.csv')
```

data

	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
...	...	...	...	...	...	...	...	...	...	...	...
57	APPLE iPhone SE (Black, 64 GB)	https://www.flipkart.com/apple-iphone-se-black...	Apple	29999	39900	24	95909	8161	MOBFWQ6BR3MK7AUG	4.5	4 GB
58	APPLE iPhone 11 (Purple, 64 GB)	https://www.flipkart.com/apple-iphone-11-purpl...	Apple	46999	54900	14	43470	3331	MOBFWQ6BTFFJKGKE	4.6	4 GB
59	APPLE iPhone 11 (White, 64 GB)	https://www.flipkart.com/apple-iphone-11-white...	Apple	46999	54900	14	43470	3331	MOBFWQ6BVWVEH3XE	4.6	4 GB
60	APPLE iPhone 11 (Black, 64 GB)	https://www.flipkart.com/apple-iphone-11-black...	Apple	46999	54900	14	43470	3331	MOBFWQ6BXGJCEYNY	4.6	4 GB
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	4 GB

62 rows × 11 columns

Next steps: Generate code with `data`   View recommended plots   New interactive sheet

```
(data.head())
```

	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

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

	0
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

```
data.describe()
```

	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

Top-10 highest rated iphones on flipkart in india

```
data.head()
```

	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

Next steps: [Generate code with `data`] [⬤ View recommended plots] [New interactive sheet]

```
highest_rated = data.sort_values(by=['Star Rating'], ascending=False)
highest_rated = highest_rated.head(10)


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)
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
```

```python
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)
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
```

How many ratings do the highest rated iphones on flipkart have?

```python
data.head()
```

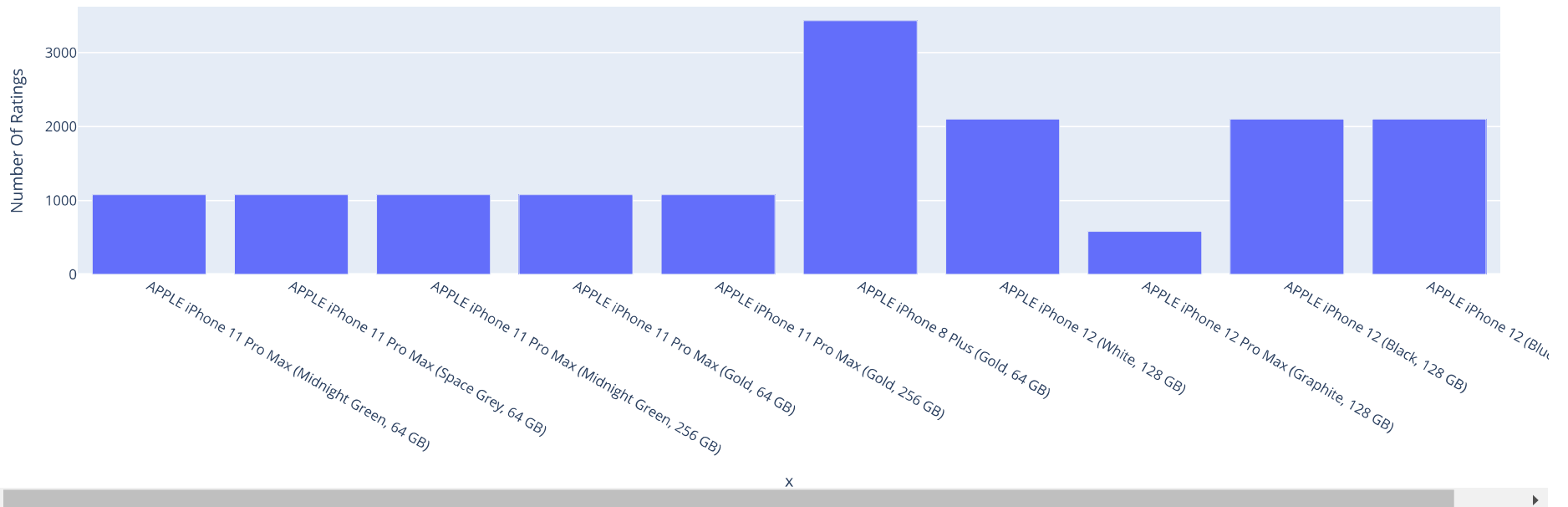|	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating	Ram
0	APPLE iPhone 8 Plus (Gold, 64 GB)	https://www.flipkart.com/apple-iphone-8-plus-g...	Apple	49900	49900	0	3431	356	MOBEXRGV7EHHTGUH	4.6	2 GB
1	APPLE iPhone 8 Plus (Space Grey, 256 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

Next steps: Generate code with `data`   View recommended plots   New interactive sheet

```
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 on Flipkart')
figure.show()
```
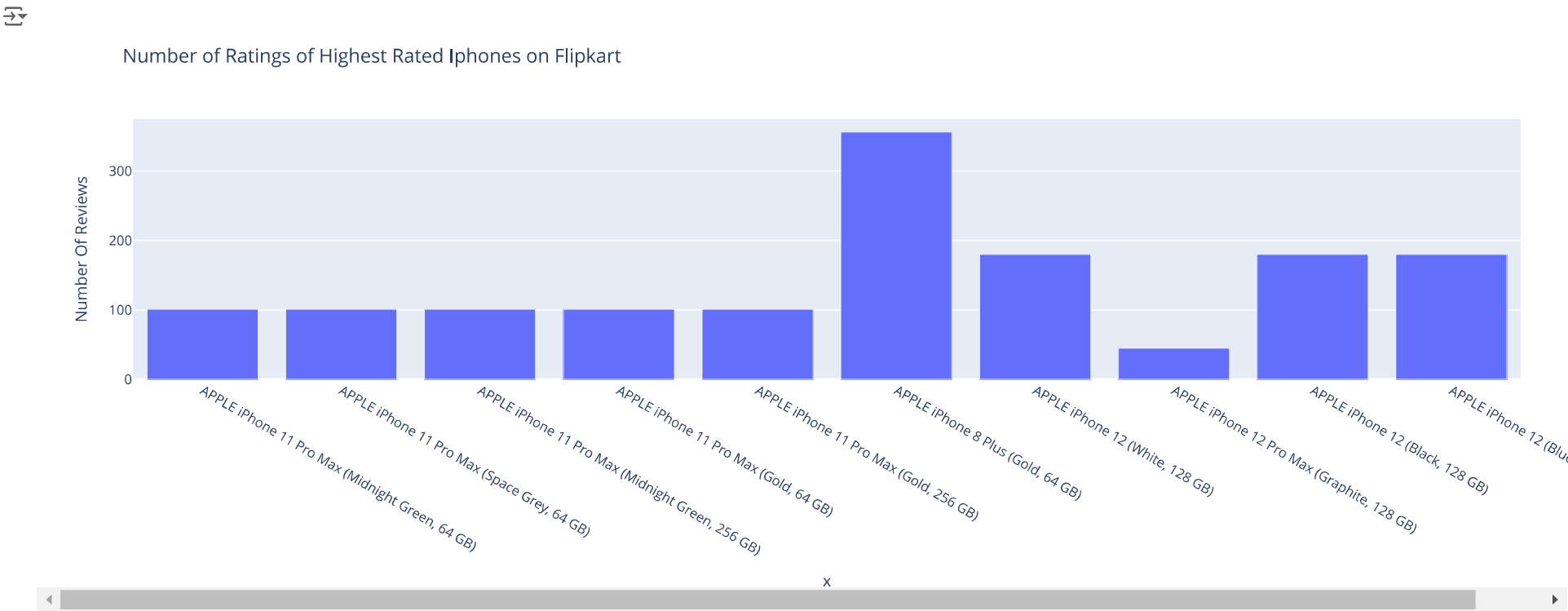

Number of Ratings of Highest Rated Iphones on Flipkart

which iphone is having the highest number of reviews?

```
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 Ratings of Highest Rated Iphones on Flipkart')
figure.show()
```


Number of Ratings of Highest Rated Iphones on Flipkart

relationship between sale price of iphone and number of ratings on flipkart

```
data.head()
```

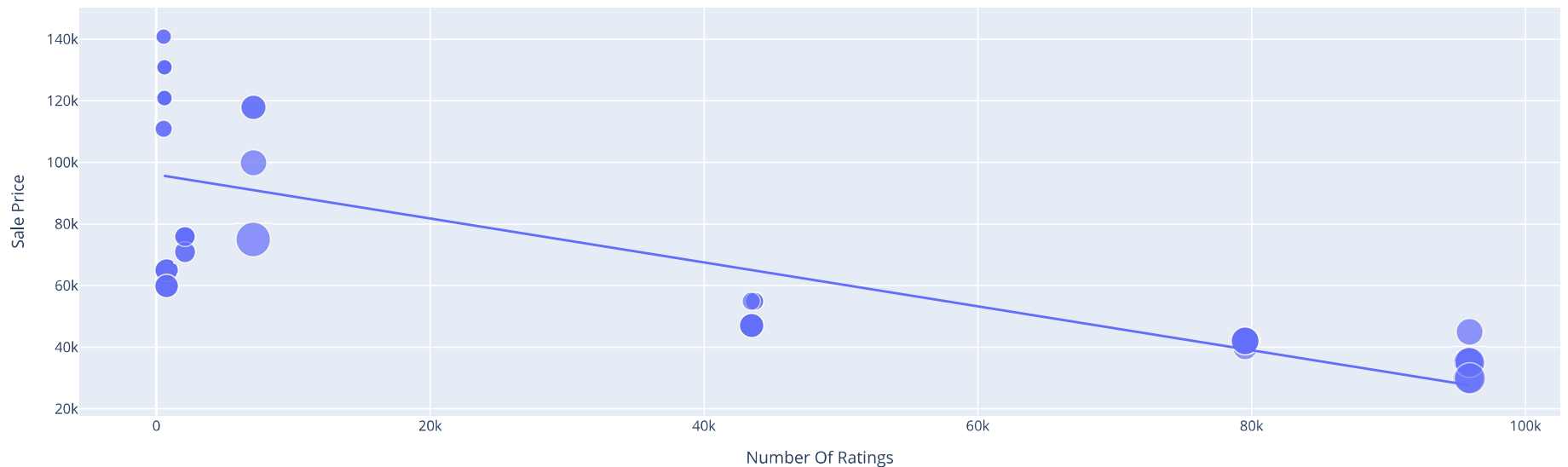|	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating	Ram
0	APPLE iPhone 8 Plus (Gold, 64 GB)	https://www.flipkart.com/apple-iphone-8-plus-g...	Apple	49900	49900	0	3431	356	MOBEXRGV7EHHTGUH	4.6	2 GB
1	APPLE iPhone 8 Plus (Space Grey, 256 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

Next steps: Generate code with `data` | View recommended plots | New interactive sheet

```
figure = px.scatter(data_frame = data, x ='Number Of Ratings', y ='Sale Price' , size = 'Discount Percentage' ,trendline= 'ols' ,title = "relationship b/w sales price and number o
figure.show()
```

relationship b/w sales price and number of rating

Relationship between discount percentage and number of ratings on flipkart

```
figure = px.scatter(data_frame = data,
```

```
        x='Number Of Ratings',
        y='Discount Percentage',
        size='Sale Price',    '
        trendline='ols',
        title="relationship b/w Discount and number of rating")
figure.show()
```

relationship b/w Discount and number of rating

Most expensive and Least expensive

```
data.head()
```

```
most_expensive = data.loc[data['Sale Price'].idxmax()]
least_expensive = data.loc[data['Sale Price'].idxmin()]
print("most expensive product on flipkart")
print(most_expensive)
print("least expensive product on flipkart")
print(least_expensive)
```

```
most expensive product on flipkart
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
```