In [3]:
```
import pandas as pd
import numpy as mp
import plotly.express as px
import plotly.graph_objects as go
```

In [4]:
```
data = pd.read_csv("apple_products (1).csv")
data
```

Out[4]:

	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

In [3]:
```
print(data.isnull().sum())
```

```
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 [4]:
```
print(data.describe())
```

```
         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
```

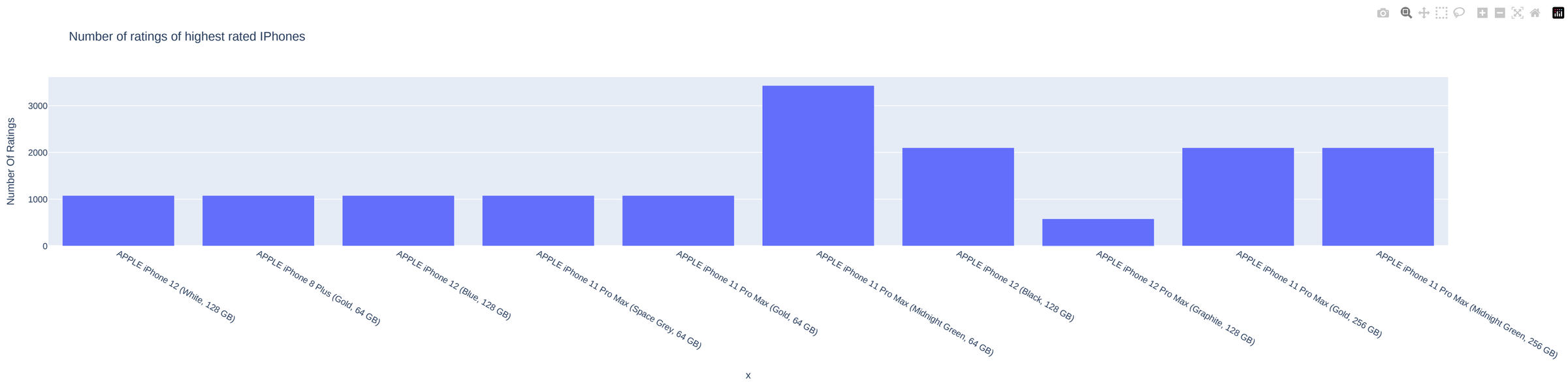
IPhone analysis in India

In [5]:
```
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
```

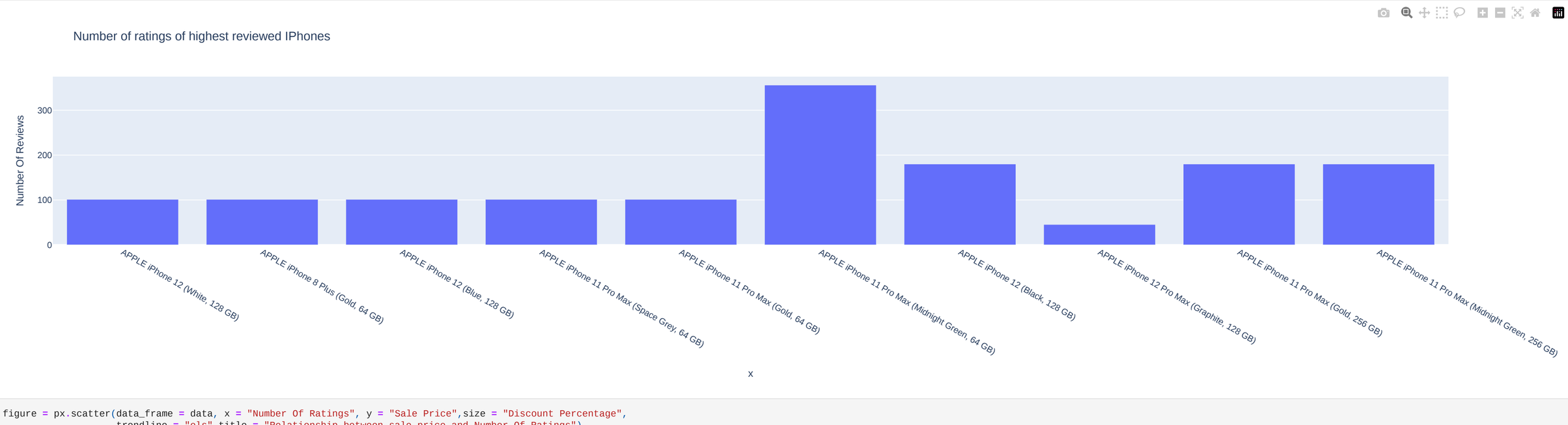
Lets have a look at the number of ratings of the highest rated IPhones on flipkart

In [6]:
```
iphones = highest_rated["Product Name"].value_counts()
labels = iphones.index
counts = highest_rated["Number Of Ratings"]
figure = px.bar(highest_rated, x = labels, y = counts, title = "Number of ratings of highest rated IPhones")
figure.show()
print(iphones)
```

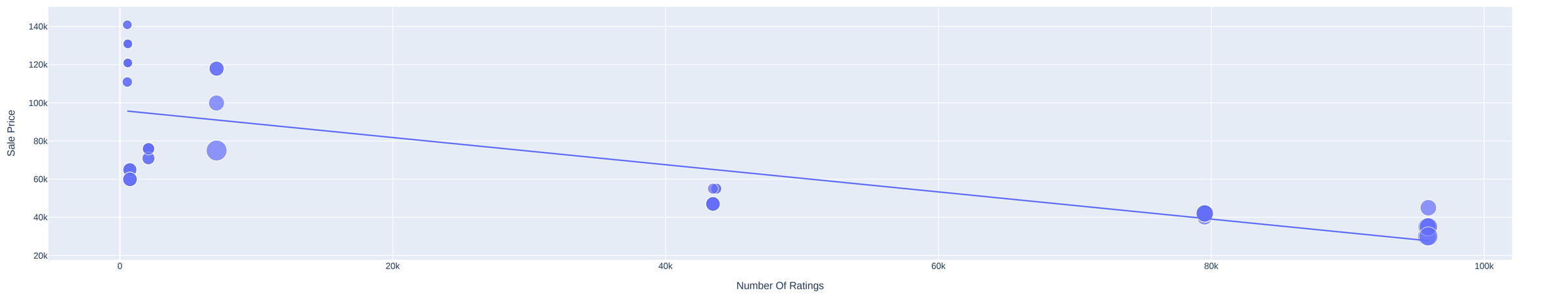



```
APPLE iPhone 12 (White, 128 GB)                   1
APPLE iPhone 8 Plus (Gold, 64 GB)                 1
APPLE iPhone 12 (Blue, 128 GB)                    1
APPLE iPhone 11 Pro Max (Space Grey, 64 GB)       1
APPLE iPhone 11 Pro Max (Gold, 64 GB)             1
APPLE iPhone 11 Pro Max (Midnight Green, 64 GB)   1
APPLE iPhone 12 (Black, 128 GB)                   1
APPLE iPhone 12 Pro Max (Graphite, 128 GB)        1
APPLE iPhone 11 Pro Max (Gold, 256 GB)            1
APPLE iPhone 11 Pro Max (Midnight Green, 256 GB)  1
Name: Product Name, dtype: int64
```

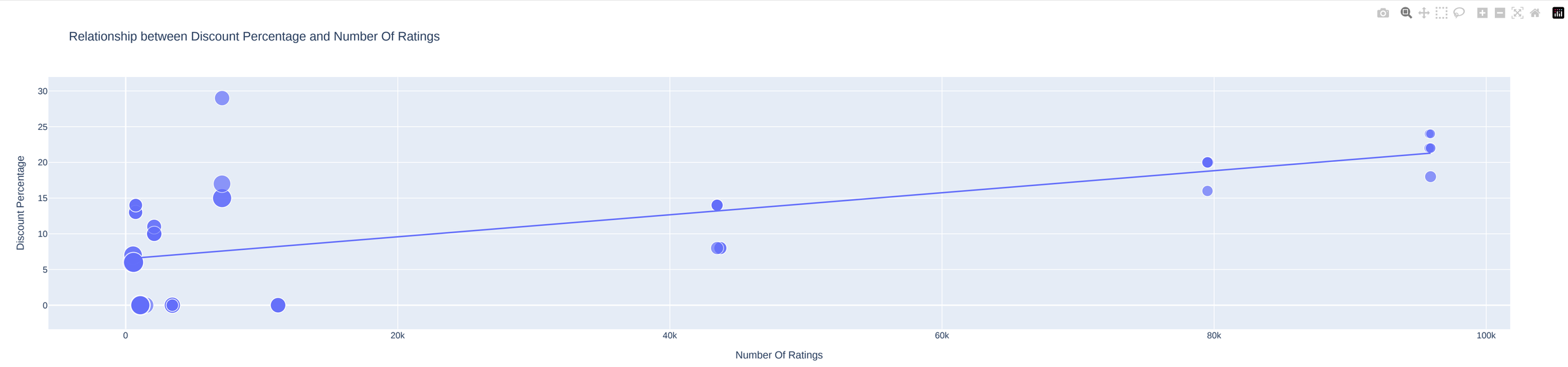
In [10]:
```
iphones = highest_rated["Product Name"].value_counts()
labels = iphones.index
counts = highest_rated["Number Of Reviews"]
figure = px.bar(highest_rated, x = labels, y = counts, title = "Number of ratings of highest reviewed IPhones")
figure.show()
```



In [9]:
```
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()
```



In [7]:
```
figure = px.scatter(data_frame = data, x = "Number Of Ratings", y = "Discount Percentage", size = "Sale Price",
                    trendline = "ols", title = "Relationship between Discount Percentage and Number Of Ratings")
figure.show()
```



In [ ]: