In [1]:
```
import pandas as pd
import numpy as np
import plotly.express as ps
import plotly.graph_objects as go
```

In [2]:
```
apple= pd.read_csv("apple_products.csv")
```

In [3]:
```
apple
```

Out[3]:

	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 [4]:
```
apple.describe()
```

Out[4]:

	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 [5]:
```
print(apple.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
```

Iphone sales analysis in India

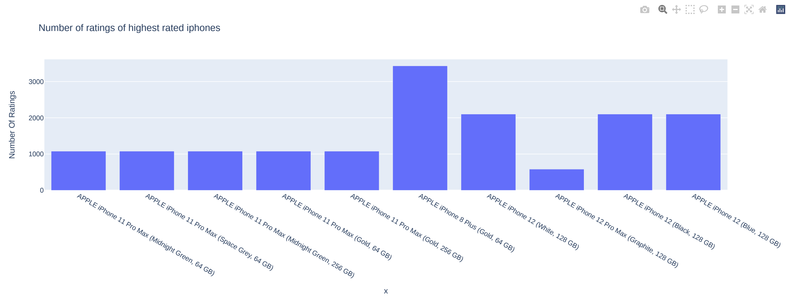
Based on star ratings

In [6]:
```
highest_rated= apple.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 iphone on flipkart

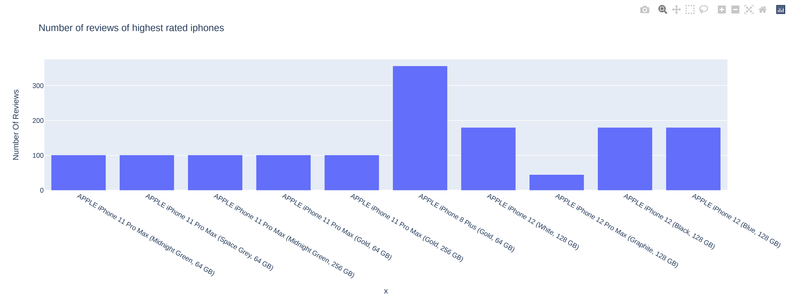
In [7]:
```
iphones= highest_rated["Product Name"].value_counts()
label= iphones.index
counts= highest_rated["Number Of Ratings"]
figure= ps.bar(highest_rated, x= label, y= counts, title= "Number of ratings of highest rated iphones")
figure.show()
```



According to the above bar graph, Apple iphone 8 Plus(Gold, 64 GB) has the most rating on Flipkart.

Lets have a look at the number of reviews of the highest rated iphone on flipkart

In [8]:
```
iphones= highest_rated["Product Name"].value_counts()
label= iphones.index
counts= highest_rated["Number Of Reviews"]
figure= ps.bar(highest_rated, x= label, y= counts, title= "Number of reviews of highest rated iphones")
figure.show()
```



Apple iphone 8 Plus(Gold, 64GB) is also leading in the highest number of reviews on Flipkart among the highest- rated iphones in india.

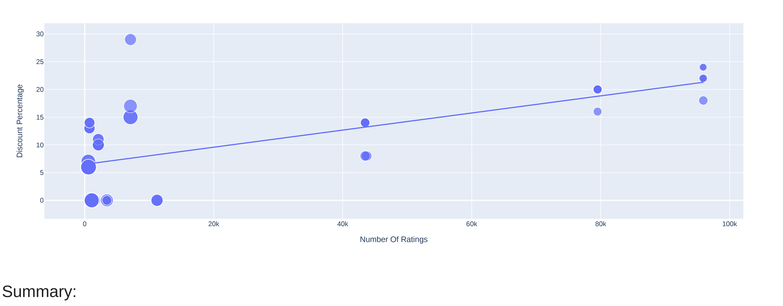
Let's have a look at the relationship between the sale price of iphones and their ratings on flipkart

In [9]:
```
figure= ps.scatter(data_frame= apple, x= "Number Of Ratings", y= "Sale Price",
                   size= "Discount Percentage", trendline= "ols", title= "Relationship between sale price & number of ratings" )
figure.show()
```

There is a negative linear relationship between the sale price of iphones and the number of ratings. it means iphones with lower sale prices are sold more in india.

Let's have a look at the Relationship Between Discount Percentage on iphones & Number of Ratings:

In [10]:
```
figure= ps.scatter(data_frame= apple, x= "Number Of Ratings", y= "Discount Percentage",
                   title= "Relationship between discount percentage & number of ratings", size= "Sale Price", trendline= "ols")
figure.show()
```



Summary:

Apple Iphone 8 Plus(Gold, 64GB) was the most appreciated iphone in india iphones with lower sale price are sold more in india iphones with high discounts are sold more in india.

In [ ]: