APPLE - IPHONE SALES ANALYSIS

```python
In [1]: import numpy as np
        import pandas as pd
        import plotly.express as px
```

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

Out[2]:

	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

```python
In [3]: data.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
```

```python
In [4]: data.isnull().sum() #no missing value
```

```
Out[4]: 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 [5]: data.isna().sum()  # no missing value
```

```
Out[5]: 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 [6]: data.describe()
```

Out[6]:

	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 rated iphone in india

```
In [7]: sorted_data=data.sort_values(["Star Rating"],ascending=False)
        sorted_data.head(10)
```

Out[7]:

	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating	Ram
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	4 GB
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	4 GB
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	4 GB
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	4 GB
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	4 GB
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
29	APPLE iPhone 12 (White, 128 GB)	https://www.flipkart.com/apple-iphone-12-white...	Apple	75900	84900	10	2101	180	MOBFWBYZBTZFGJF9	4.6	6 GB
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	6 GB
35	APPLE iPhone 12 (Black, 128 GB)	https://www.flipkart.com/apple-iphone-12-black...	Apple	75900	84900	10	2101	180	MOBFWBYZK3HACR72	4.6	6 GB
36	APPLE iPhone 12 (Blue, 128 GB)	https://www.flipkart.com/apple-iphone-12-blue-...	Apple	75900	84900	10	2101	180	MOBFWBYZKPTZF9VG	4.6	6 GB

```
In [8]:  highest_rated= sorted_data.head(10)
         highest_rated
```

Out[8]:

	Product Name	Product URL	Brand	Sale Price	Mrp	Discount Percentage	Number Of Ratings	Number Of Reviews	Upc	Star Rating	Ram
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	4 GB
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	4 GB
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	4 GB
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	4 GB
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	4 GB
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
29	APPLE iPhone 12 (White, 128 GB)	https://www.flipkart.com/apple-iphone-12-white...	Apple	75900	84900	10	2101	180	MOBFWBYZBTZFGJF9	4.6	6 GB
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	6 GB
35	APPLE iPhone 12 (Black, 128 GB)	https://www.flipkart.com/apple-iphone-12-black...	Apple	75900	84900	10	2101	180	MOBFWBYZK3HACR72	4.6	6 GB
36	APPLE iPhone 12 (Blue, 128 GB)	https://www.flipkart.com/apple-iphone-12-blue-...	Apple	75900	84900	10	2101	180	MOBFWBYZKPTZF9VG	4.6	6 GB

```
In [9]:  iphone= highest_rated["Product Name"].value_counts()
         iphone
```

```
Out[9]:  Product Name
         APPLE iPhone 11 Pro Max (Midnight Green, 64 GB)     1
         APPLE iPhone 11 Pro Max (Space Grey, 64 GB)         1
         APPLE iPhone 11 Pro Max (Midnight Green, 256 GB)    1
         APPLE iPhone 11 Pro Max (Gold, 64 GB)               1
         APPLE iPhone 11 Pro Max (Gold, 256 GB)              1
         APPLE iPhone 8 Plus (Gold, 64 GB)                   1
         APPLE iPhone 12 (White, 128 GB)                     1
         APPLE iPhone 12 Pro Max (Graphite, 128 GB)          1
         APPLE iPhone 12 (Black, 128 GB)                     1
         APPLE iPhone 12 (Blue, 128 GB)                      1
         Name: count, dtype: int64
```
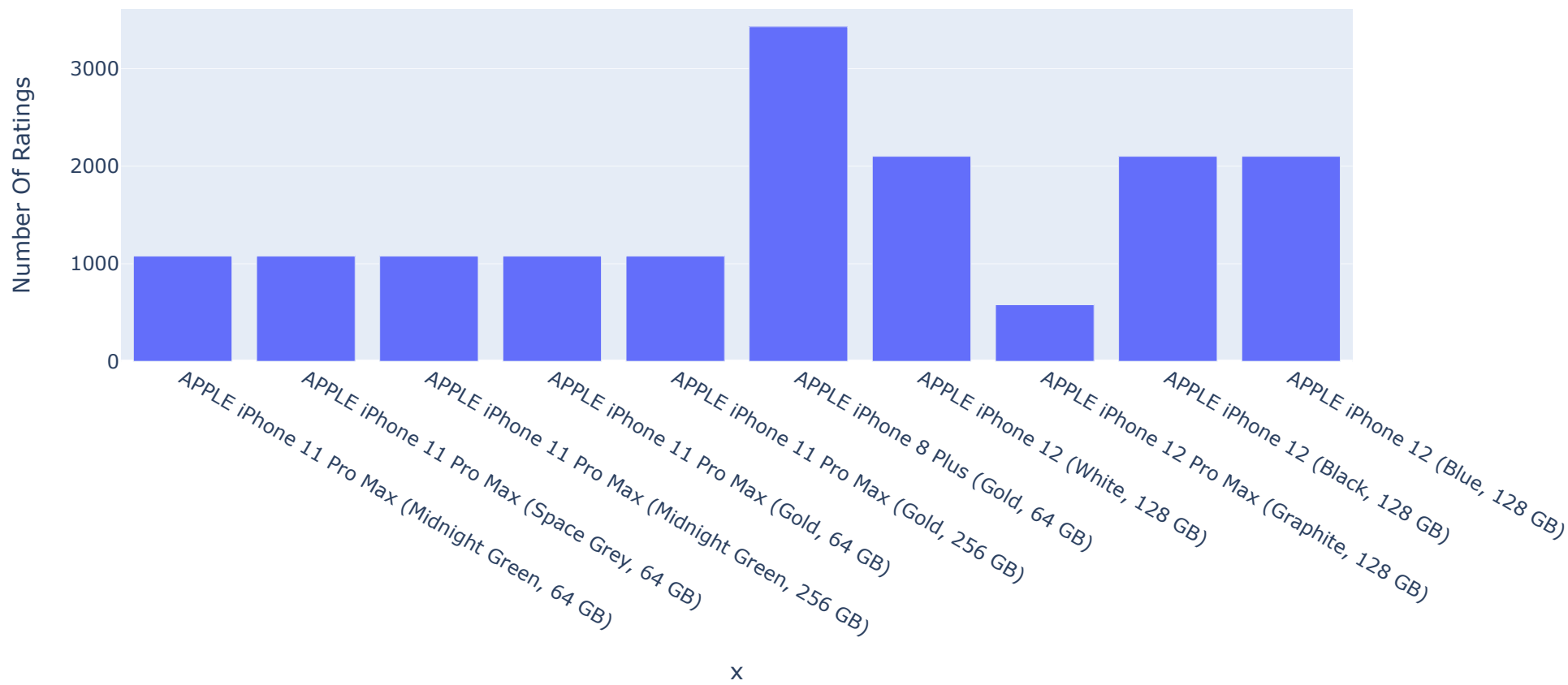
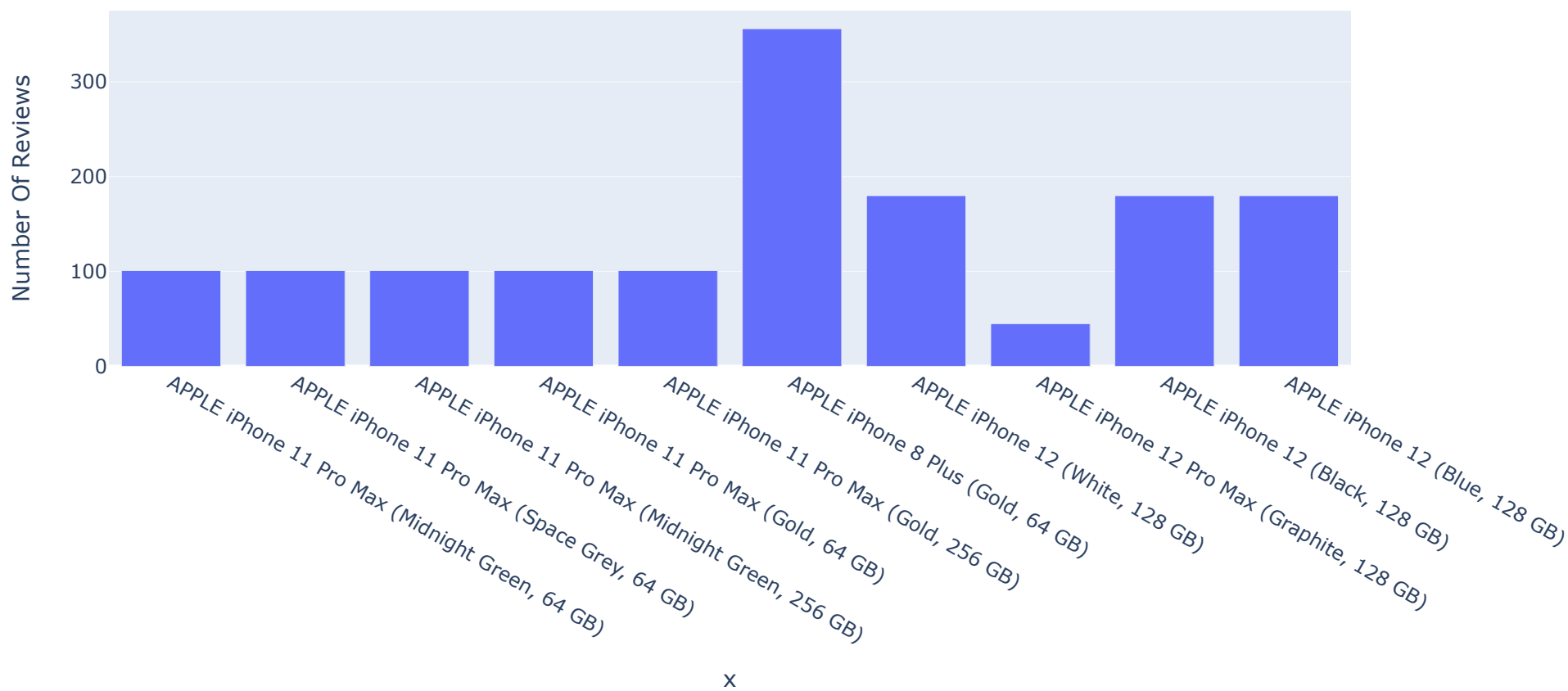## Graph representing top 10 iphones and their respective ratings

In [10]:
```python
lables= iphone.index
ratings= highest_rated["Number Of Ratings"]
figure=px.bar(highest_rated, x=lables, y=ratings, title="Number of ratings of top 10 iphone")
figure.show()
```

Number of ratings of top 10 iphone

In [11]:
```python
reviews= highest_rated["Number Of Reviews"]
figure= px.bar(highest_rated, x=lables, y=reviews, title="Number of reviews of top 10 iphone")
figure.show()
```

Number of reviews of top 10 iphone

```
In [12]: 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()
```


Relationship between sale price and number of ratings

```
In [13]: 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()
```


Relationship between Discount percentage and number of ratings