# APPLE - IPHONE SALES ANALYSIS

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

In [2]:
```python
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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| 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 | 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 |
| 3 | APPLE iPhone 8 (Silver, 256 GB) | https://www.flipkart.com/apple-iphone-8-silver... | Apple | 77000 | 77000 | 0 | 11202 | 794 | MOBEXRGVMZWUHCBA | 4.5 |
| 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 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 57 | APPLE iPhone SE (Black, 64 GB) | https://www.flipkart.com/apple-iphone-se-black... | Apple | 29999 | 39900 | 24 | 95909 | 8161 | MOBFWQ6BR3MK7AUG | 4.5 |

| | Product Name | Product URL | Brand | Sale Price | Mrp | Discount Percentage | Number Of Ratings | Number Of Reviews | Upc | Star Rating |
|---|---|---|---|---|---|---|---|---|---|---|
| 58 | APPLE iPhone 11 (Purple, 64 GB) | https://www.flipkart.com/apple-iphone-11-purpl... | Apple | 46999 | 54900 | 14 | 43470 | 3331 | MOBFWQ6BTFFJKGKE | 4.6 |
| 59 | APPLE iPhone 11 (White, 64 GB) | https://www.flipkart.com/apple-iphone-11-white... | Apple | 46999 | 54900 | 14 | 43470 | 3331 | MOBFWQ6BVWVEH3XE | 4.6 |
| 60 | APPLE iPhone 11 (Black, 64 GB) | https://www.flipkart.com/apple-iphone-11-black... | Apple | 46999 | 54900 | 14 | 43470 | 3331 | MOBFWQ6BXGJCEYNY | 4.6 |
| 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 |

62 rows × 11 columns

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
```

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]:
```python
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 | S Rat |
|---|---|---|---|---|---|---|---|---|---|---|
| 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 | |
| 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 | |
| 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 | |
| 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 | |
| 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 | |
| 0 | APPLE iPhone 8 Plus (Gold, 64 GB) | https://www.flipkart.com/apple-iphone-8-plus-g... | Apple | 49900 | 49900 | 0 | 3431 | 356 | MOBEXRGV7EHHTGUH | |

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

```
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 | S Rat |
|---|---|---|---|---|---|---|---|---|---|---|
| 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 | |
| 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 | |
| 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 | |
| 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 | |
| 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 | |
| 0 | APPLE iPhone 8 Plus (Gold, 64 GB) | https://www.flipkart.com/apple-iphone-8-plus-g... | Apple | 49900 | 49900 | 0 | 3431 | 356 | MOBEXRGV7EHHTGUH | |

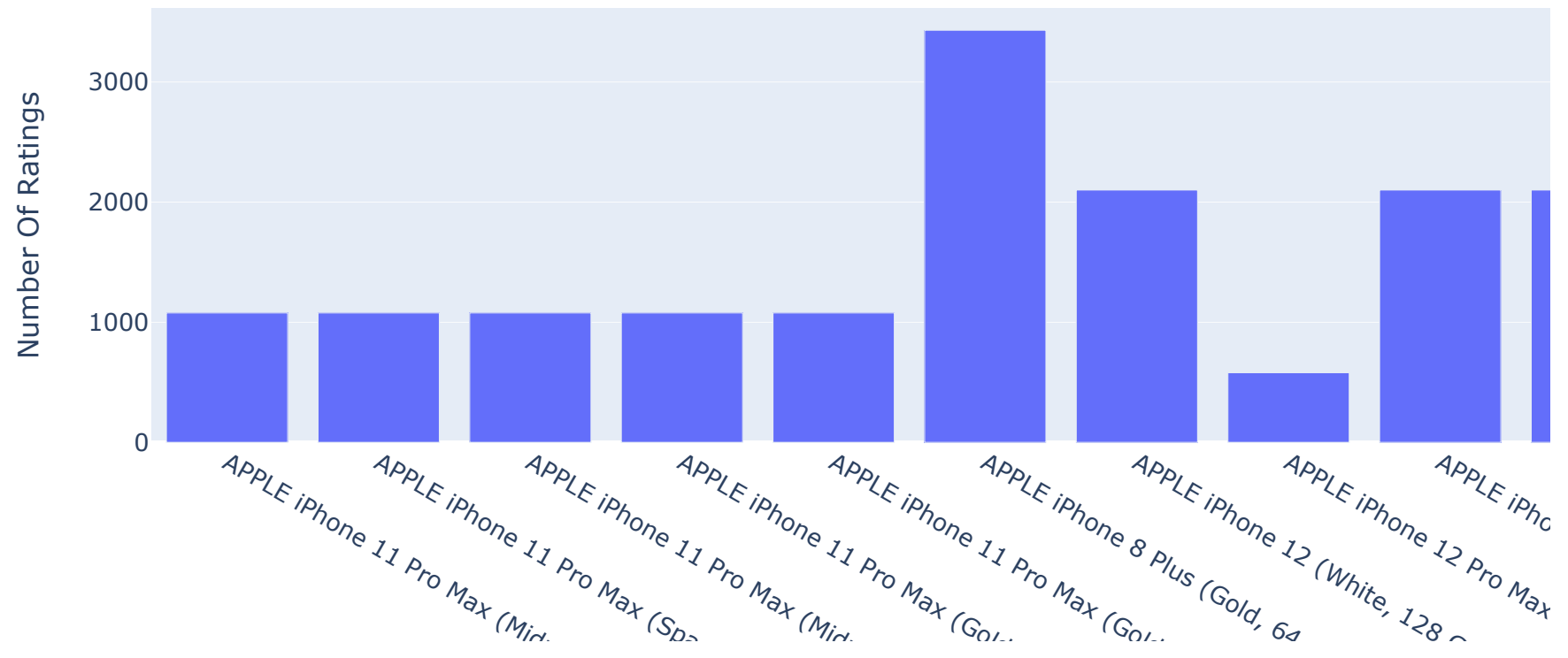| | Product Name | Product URL | Brand | Sale Price | Mrp | Discount Percentage | Number Of Ratings | Number Of Reviews | Upc | S Rat |
|---|---|---|---|---|---|---|---|---|---|---|
| 29 | APPLE iPhone 12 (White, 128 GB) | https://www.flipkart.com/apple-iphone-12-white... | Apple | 75900 | 84900 | 10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

In [9]: 
```python
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
```

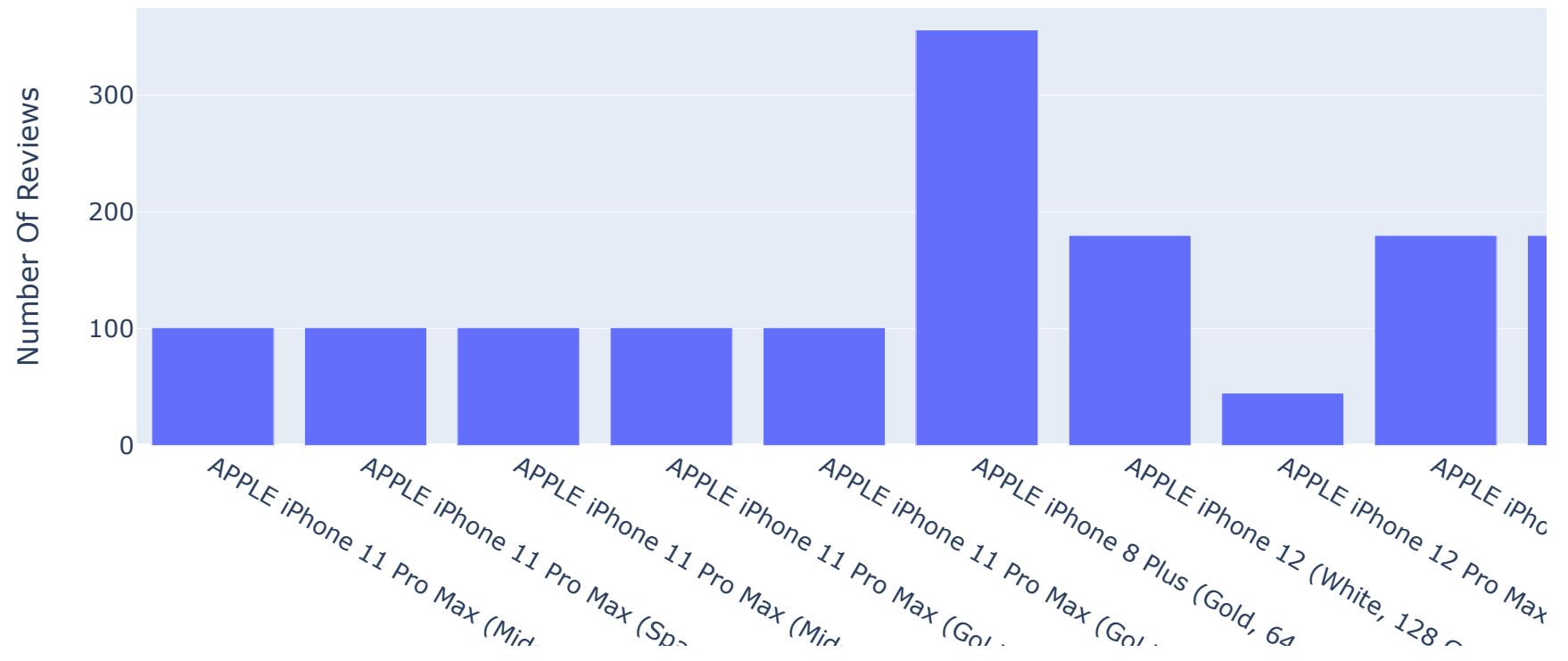# Graph representing top 10 iphones and their respective ratings

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]:
```python
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 ratin
figure.show()
```

## Relationship between Discount percentage and number of ratings