In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:
```
df=pd.read_csv("12_mobile_prices_2023.csv")
df
```

Out[2]:

	Phone Name	Rating ?/5	Number of Ratings	RAM	ROM/Storage	Back/Rare Camera	Front Camera	Battery	Processor	Price in INR
0	POCO C50 (Royal Blue, 32 GB)	4.2	33,561	2 GB RAM	32 GB ROM	8MP Dual Camera	5MP Front Camera	5000 mAh	Mediatek Helio A22 Processor, Upto 2.0 GHz Pro...	₹5,649
1	POCO M4 5G (Cool Blue, 64 GB)	4.2	77,128	4 GB RAM	64 GB ROM	50MP + 2MP	8MP Front Camera	5000 mAh	Mediatek Dimensity 700 Processor	₹11,999
2	POCO C51 (Royal Blue, 64 GB)	4.3	15,175	4 GB RAM	64 GB ROM	8MP Dual Rear Camera	5MP Front Camera	5000 mAh	Helio G36 Processor	₹6,999
3	POCO C55 (Cool Blue, 64 GB)	4.2	22,621	4 GB RAM	64 GB ROM	50MP Dual Rear Camera	5MP Front Camera	5000 mAh	Mediatek Helio G85 Processor	₹7,749
4	POCO C51 (Power Black, 64 GB)	4.3	15,175	4 GB RAM	64 GB ROM	8MP Dual Rear Camera	5MP Front Camera	5000 mAh	Helio G36 Processor	₹6,999
...	...	...	...	...	...	...	...	...	...	...
1831	Infinix Note 7 (Forest Green, 64 GB)	4.3	25,582	4 GB RAM	64 GB ROM	48MP + 2MP + 2MP + AI Lens Camera	16MP Front Camera	5000 mAh	MediaTek Helio G70 Processor	₹14,999
1832	Infinix Note 7 (Bolivia Blue, 64 GB)	4.3	25,582	4 GB RAM	64 GB ROM	48MP + 2MP + 2MP + AI Lens Camera	16MP Front Camera	5000 mAh	MediaTek Helio G70 Processor	₹14,999
1833	Infinix Note 7 (Aether	4.3	25,582	4 GB RAM	64 GB ROM	48MP + 2MP + 2MP + AI	16MP Front Camera	5000 mAh	MediaTek Helio G70 Processor	₹14,999

	Phone Name	Rating ?/5	Number of Ratings	RAM	ROM/Storage	Back/Rare Camera	Front Camera	Battery	Processor	Price in INR
	Black, 64 GB)					Lens Camera				
1834	Infinix Zero 8i (Silver Diamond, 128 GB)	4.2	7,117	8 GB RAM	128 GB ROM	48MP + 8MP + 2MP + AI Lens Camera	16MP + 8MP Dual Front Camera	4500 mAh	MediaTek Helio G90T Processor	₹18,999
1835	Infinix S5 (Quetzal Cyan, 64 GB)	4.3	15,701	4 GB RAM	64 GB ROM	16MP + 5MP + 2MP + Low Light Sensor	32MP Front Camera	4000 mAh	Helio P22 (MTK6762) Processor	₹10,999

1836 rows × 11 columns

In [3]:
```
df.head()
```

Out[3]:

	Phone Name	Rating ?/5	Number of Ratings	RAM	ROM/Storage	Back/Rare Camera	Front Camera	Battery	Processor	Price in INR	Dat Scra
0	POCO C50 (Royal Blue, 32 GB)	4.2	33,561	2 GB RAM	32 GB ROM	8MP Dual Camera	5MP Front Camera	5000 mAh	Mediatek Helio A22 Processor, Upto 2.0 GHz Pro...	₹5,649	2023
1	POCO M4 5G (Cool Blue, 64 GB)	4.2	77,128	4 GB RAM	64 GB ROM	50MP + 2MP	8MP Front Camera	5000 mAh	Mediatek Dimensity 700 Processor	₹11,999	2023
2	POCO C51 (Royal Blue, 64 GB)	4.3	15,175	4 GB RAM	64 GB ROM	8MP Dual Rear Camera	5MP Front Camera	5000 mAh	Helio G36 Processor	₹6,999	2023
3	POCO C55 (Cool Blue, 64 GB)	4.2	22,621	4 GB RAM	64 GB ROM	50MP Dual Rear Camera	5MP Front Camera	5000 mAh	Mediatek Helio G85 Processor	₹7,749	2023
4	POCO C51 (Power Black, 64 GB)	4.3	15,175	4 GB RAM	64 GB ROM	8MP Dual Rear Camera	5MP Front Camera	5000 mAh	Helio G36 Processor	₹6,999	2023

DATA CLEANING AND DATA PREPROCESSING

In [4]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1836 entries, 0 to 1835
Data columns (total 11 columns):
 #   Column             Non-Null Count  Dtype  
---  ------             --------------  -----  
 0   Phone Name         1836 non-null   object 
 1   Rating ?/5         1836 non-null   float64
 2   Number of Ratings  1836 non-null   object 
 3   RAM                1836 non-null   object 
 4   ROM/Storage        1662 non-null   object 
 5   Back/Rare Camera   1827 non-null   object 
 6   Front Camera       1435 non-null   object 
 7   Battery            1826 non-null   object 
 8   Processor          1781 non-null   object 
 9   Price in INR       1836 non-null   object 
 10  Date of Scraping   1836 non-null   object 
dtypes: float64(1), object(10)
memory usage: 157.9+ KB
```

In [5]:
```
df.describe()
```

Out[5]:

	Rating ?/5
count	1836.000000
mean	4.210512
std	0.543912
min	0.000000
25%	4.200000
50%	4.300000
75%	4.400000
max	4.800000

In [6]:
```
df.columns
```

Out[6]:
```
Index(['Phone Name', 'Rating ?/5', 'Number of Ratings', 'RAM', 'ROM/Storage',
       'Back/Rare Camera', 'Front Camera', 'Battery', 'Processor',
       'Price in INR', 'Date of Scraping'],
      dtype='object')
```

In [7]:
```
df1=df.dropna(axis=1)
df1
```

Out[7]:

	Phone Name	Rating ?/5	Number of Ratings	RAM	Price in INR	Date of Scraping
0	POCO C50 (Royal Blue, 32 GB)	4.2	33,561	2 GB RAM	₹5,649	2023-06-17
1	POCO M4 5G (Cool Blue, 64 GB)	4.2	77,128	4 GB RAM	₹11,999	2023-06-17
2	POCO C51 (Royal Blue, 64 GB)	4.3	15,175	4 GB RAM	₹6,999	2023-06-17
3	POCO C55 (Cool Blue, 64 GB)	4.2	22,621	4 GB RAM	₹7,749	2023-06-17
4	POCO C51 (Power Black, 64 GB)	4.3	15,175	4 GB RAM	₹6,999	2023-06-17
...	...	...	...	...	...	...
1831	Infinix Note 7 (Forest Green, 64 GB)	4.3	25,582	4 GB RAM	₹14,999	2023-06-17
1832	Infinix Note 7 (Bolivia Blue, 64 GB)	4.3	25,582	4 GB RAM	₹14,999	2023-06-17
1833	Infinix Note 7 (Aether Black, 64 GB)	4.3	25,582	4 GB RAM	₹14,999	2023-06-17
1834	Infinix Zero 8i (Silver Diamond, 128 GB)	4.2	7,117	8 GB RAM	₹18,999	2023-06-17
1835	Infinix S5 (Quetzal Cyan, 64 GB)	4.3	15,701	4 GB RAM	₹10,999	2023-06-17

1836 rows × 6 columns

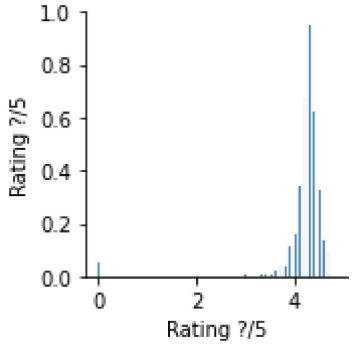
In [8]:
```
df1.columns
```

Out[8]:
```
Index(['Phone Name', 'Rating ?/5', 'Number of Ratings', 'RAM', 'Price in INR',
       'Date of Scraping'],
      dtype='object')
```

EDA AND VISUALIZATION

In [9]:
```
sns.pairplot(df1)
```

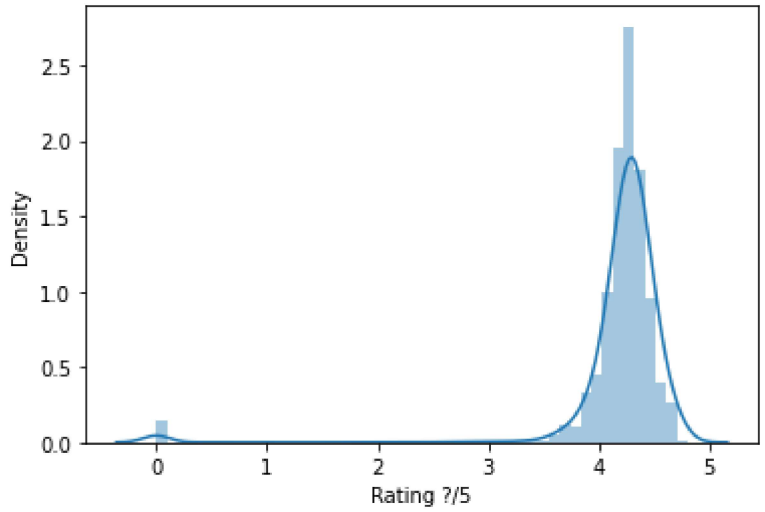
Out[9]:
```
<seaborn.axisgrid.PairGrid at 0x2477137abe0>
```



In [10]:
```
sns.distplot(df1['Rating ?/5'])
```

```
C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2557: FutureWarning:
`distplot` is a deprecated function and will be removed in a future version. Please adap
t your code to use either `displot` (a figure-level function with similar flexibility) o
r `histplot` (an axes-level function for histograms).
  warnings.warn(msg, FutureWarning)
```

Out[10]: <AxesSubplot:xlabel='Rating ?/5', ylabel='Density'>



In [11]:
```
sns.heatmap(df1.corr())
```

Out[11]: <AxesSubplot:>

TO TRAIN THE MODEL AND MODEL BULDING

In [12]:
```
x=df[['Rating ?/5','Rating ?/5']]
y=df['Rating ?/5']
```

In [13]:
```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.3)
```

In [14]:
```
from sklearn.linear_model import LinearRegression
lr=LinearRegression()
lr.fit(x_train,y_train)
```

Out[14]:
```
LinearRegression()
```

In [15]:
```
lr.intercept_
```

Out[15]:
```
0.0
```

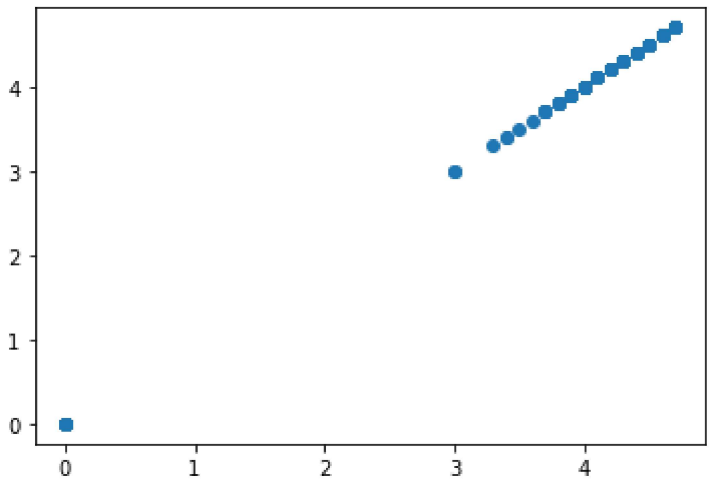
In [16]:
```
coeff=pd.DataFrame(lr.coef_,x.columns,columns=['Co-efficient'])
coeff
```

Out[16]:

	Co-efficient
Rating ?/5	0.5
Rating ?/5	0.5

In [17]:
```
prediction =lr.predict(x_test)
plt.scatter(y_test,prediction)
```

Out[17]:
```
<matplotlib.collections.PathCollection at 0x24773786fa0>
```



ACCURACY

In [18]:
```
lr.score(x_test,y_test)
```

Out[18]: 1.0

In [19]:
```
lr.score(x_train,y_train)
```

Out[19]: 1.0

In [20]:
```
from sklearn.linear_model import Ridge,Lasso
rr=Ridge(alpha=10)
rr.fit(x_train,y_train)
```

Out[20]: Ridge(alpha=10)

In [21]:
```
rr.score(x_train,y_train)
```

Out[21]: 0.9998253523551933

In [22]:
```
rr.score(x_test,y_test)
```

Out[22]: 0.9998253158548842

In [23]:
```
la=Lasso(alpha=10)
la.fit(x_train,y_train)
```

Out[23]: Lasso(alpha=10)

In [24]:
```
la.score(x_train,y_train)
```

Out[24]: 0.0

In [25]:
```
la.score(x_test,y_test)
```

Out[25]: -0.00020899399559826115