```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
from sklearn import preprocessing
from sklearn.preprocessing import LabelEncoder
from sklearn.ensemble import RandomForestRegressor
from sklearn.model_selection import train_test_split


apps=pd.read_csv('googleplaystore.csv')
```

Data Exploration and Cleaning

```
apps.shape
```

```
(10841, 13)
```

```
apps.head(5)
```

	App	Category	Rating	Reviews	Size	Installs	Type	Price	Con Ra
0	Photo Editor & Candy Camera & Grid & ScrapBook	ART_AND_DESIGN	4.1	159	19M	10,000+	Free	0	Ever
1	Coloring book moana	ART_AND_DESIGN	3.9	967	14M	500,000+	Free	0	Ever
	U Launcher Lite –								

```
apps.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10841 entries, 0 to 10840
Data columns (total 13 columns):
App               10841 non-null object
Category          10841 non-null object
Rating            9367 non-null float64
Reviews           10841 non-null object
Size              10841 non-null object
Installs          10841 non-null object
Type              10840 non-null object
Price             10841 non-null object
Content Rating    10840 non-null object
```

```
Genres            10841 non-null object
Last Updated      10841 non-null object
Current Ver       10833 non-null object
Android Ver       10838 non-null object
dtypes: float64(1), object(12)
memory usage: 1.1+ MB
```

There are 10841 uncleaned samples for analysis with 13 columns. Only the Ratings column is represented as numeric. Other columns need to be worked on

```
apps['App'].value_counts()
```

```
CBS Sports App - Scores, News, Stats & Watch Live     8
ESPN                                                  7
Duolingo: Learn Languages Free                        7
8 Ball Pool                                           7
Candy Crush Saga                                      7
Zombie Catchers                                       6
Sniper 3D Gun Shooter: Free Shooting Games - FPS      6
Bowmasters                                            6
Temple Run 2                                          6
Nick                                                  6
Helix Jump                                            6
Subway Surfers                                        6
slither.io                                            6
Bleacher Report: sports news, scores, & highlights    6
Bubble Shooter                                        6
Skyscanner                                            5
MLB At Bat                                            5
Granny                                                5
Viber Messenger                                       5
theScore: Live Sports Scores, News, Stats & Videos    5
Netflix                                               5
Wish - Shopping Made Fun                              5
Flow Free                                             5
BeautyPlus - Easy Photo Editor & Selfie Camera        5
Zombie Tsunami                                        5
Yahoo Fantasy Sports - #1 Rated Fantasy App           5
TripAdvisor Hotels Flights Restaurants Attractions    5
Angry Birds Classic                                   5
Plants vs. Zombies FREE                               5
                                                     ..
MD PAWS AH                                            1
ERres- Emergency Medicine                             1
FD Mobile                                             1
AE Bulletins                                          1
Bitmoji – Your Personal Emoji                         1
CI Attendance                                         1
Numbers Into Words                                    1
Words (188 Category)                                  1
NAVITIME - Map & Transfer Navi                        1
Florida Travel Guide - TOURIAS                        1

The Gang Sniper V. Pocket Edition.                    1
Professor Online SEDUC-CE                             1
```

```
Moment                                                1
DC Universe Online Map                                1
BI Barcode Scanner                                    1
Anime Expo 2018                                       1
San Andreas City : Auto Theft Car gangster            1
BBWCupid - BBW Dating App                             1
Delivery yogi.                                        1
BluTV                                                 1
BP Tracker-Symptoms & Solution                        1
Tap The Easter Egg!                                   1
B Tiff Viewer                                         1
FO Interim                                            1
Ghost Detector                                        1
Hitman GO                                             1
Bluetooth Auto Connect                                1
BW-Joseki                                             1
Metal Detector Pro 2015                               1
Friend Find: free chat + flirt dating app             1
```

```
apps['Reviews']=pd.to_numeric(apps.Reviews, errors = 'coerce') #convert reviews that is ob
```

```
apps.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10841 entries, 0 to 10840
Data columns (total 13 columns):
App               10841 non-null object
Category          10841 non-null object
Rating            9367 non-null float64
Reviews           10840 non-null float64
Size              10841 non-null object
Installs          10841 non-null object
Type              10840 non-null object
Price             10841 non-null object
Content Rating    10840 non-null object
Genres            10841 non-null object
Last Updated      10841 non-null object
Current Ver       10833 non-null object
Android Ver       10838 non-null object
dtypes: float64(2), object(11)
memory usage: 1.1+ MB
```

```
apps1=apps.drop_duplicates('App',keep='last').sort_values('Reviews')#drop those apps which
```

```
apps1['App'].value_counts()  #only unique app is present
```

```
Them Bombs: co-op board game play with 2-4 friends    1
Sahadan Live Scores                                   1
Power Rangers: Legacy Wars                            1
EP RSS Reader                                         1
BZ-Digital                                            1
Company Kitchen                                       1
AG Track                                              1
Wheretoget: Shop in style                             1
Map My Fitness Workout Trainer                        1
Google Korean Input                                   1
FK Crvena zvezda                                      1
Facial Wrinkle Reduction                              1
DP and Status Images | All Latest Status 2018         1
```

```
Weather –Simple weather forecast                      1
Signal Spy - Monitor Signal Strength & Data Usage      1
Zombie War Z : Hero Survival Rules                    1
Archos File Manager                                   1
Fancy Widgets                                         1
LinkedIn Learning: Online Courses to Learn Skills     1
CX North America                                      1
Vudu Movies & TV                                      1
Cochrane Library                                      1
Random Love (BF)                                      1
Girls Nancy Ajram Without Net                         1
CP Calculator                                         1
FL Lottery Results                                    1
Axe Champ                                             1
CS Browser | #1 & BEST BROWSER                        1
ClanManagerTT2                                        1
                                                     ..
Home Workout for Men - Bodybuilding                   1
CP evolution calculator Pokemo                        1
Dulquer Salmaan HD Wallpapers                         1
SmartNews: Breaking News Headlines                    1
Don't touch my phone                                  1
Movie DB                                              1
ASOS                                                  1
Meet4U - Chat, Love, Singles!                         1
QuickPic - Photo Gallery with Google Drive Support    1
All Language Translator                               1
El Laberinto del Demonio 3D                           1
Luxy Pro- Elite Dating Single                         1
CAPTCHA Pack for Sleep as Android                     1
BW App                                                1
AJ Blue Icon Pack                                     1
Bihar Land Records - RoR and EB Quick Pay             1
BURGER KING® Puerto Rico                              1
PlusOne                                               1
Christian Dating For Free App                         1
EP Chain Reaction                                     1
CJmall                                                1
Learn C++                                             1
AH! Soundboard                                        1
Hojiboy Tojiboyev Life Hacks                          1
Receipt Hog - Receipts to Cash                        1
CG Vidhansabha Chunav 2018                            1
DS                                                    1
Fat Burning Workout - Home Weight lose                1
BlueJeans for Android                                 1
Mobizen Screen Recorder for LG - Record, Capture      1
```

```
apps1.shape
```

```
(9660, 13)
```

```
apps1['Installs'] = apps1.Installs.str.replace('+', '')    #replace "+" and "," with " "
apps1['Installs'] = apps1.Installs.str.replace(',', '')
```

```
apps1.head(10)
```

	App	Category	Rating	Reviews	Size	Installs	Type	Pric
8872	Eat Right Diet (by Dt Shreya's Family Diet Cli...	HEALTH_AND_FITNESS	NaN	0.0	12M	10	Free	
7440	C J Academy	FAMILY	NaN	0.0	5.2M	10	Free	
627	CAM5678 Video Chat	DATING	NaN	0.0	39M	500	Free	
628	Video chat live advices	DATING	NaN	0.0	8.0M	100	Free	
9910	EU RCD Guide	BOOKS_AND_REFERENCE	NaN	0.0	45M	10	Paid	$3.(

```
apps1['Installs'] = pd.to_numeric(apps1['Installs'],errors = 'coerce')  #convert object to
```

```
apps1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 9660 entries, 8872 to 10472
Data columns (total 13 columns):
App               9660 non-null object
Category          9660 non-null object
Rating            8197 non-null float64
Reviews           9659 non-null float64
Size              9660 non-null object
Installs          9659 non-null float64
Type              9659 non-null object
Price             9660 non-null object
Content Rating    9659 non-null object
Genres            9660 non-null object
Last Updated      9660 non-null object
Current Ver       9652 non-null object
Android Ver       9657 non-null object
dtypes: float64(3), object(10)
memory usage: 1.0+ MB
```

```
apps1.shape
```

```
(9660, 13)
```

```
apps1.columns
```

```
Index(['App', 'Category', 'Rating', 'Reviews', 'Size', 'Installs', 'Type',
       'Price', 'Content Rating', 'Genres', 'Last Updated', 'Current Ver',
       'Android Ver'],
      dtype='object')
```

```
apps1['Price']=apps1.Price.str.replace('$','') #replace '$' with null
```

```
apps1['Price']=pd.to_numeric(apps1.Price, errors = 'coerce')#covert the price that is obje
```

```
apps1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 9660 entries, 8872 to 10472
Data columns (total 13 columns):
App               9660 non-null object
Category          9660 non-null object
Rating            8197 non-null float64
Reviews           9659 non-null float64
Size              9660 non-null object
Installs          9659 non-null float64
Type              9659 non-null object
Price             9659 non-null float64
Content Rating    9659 non-null object
Genres            9660 non-null object
Last Updated      9660 non-null object
Current Ver       9652 non-null object
Android Ver       9657 non-null object
dtypes: float64(4), object(9)
memory usage: 1.0+ MB
```

```
apps1['Size'].value_counts()
```

```
Varies with device    1227
11M                    182
12M                    181
14M                    177
13M                    177
15M                    164
26M                    143
17M                    143
16M                    137
19M                    130
10M                    129
21M                    124
20M                    123
18M                    119
25M                    119
24M                    117
22M                    104
23M                    103
27M                     92
29M                     92
28M                     90
30M                     83
3.3M                    73
33M                     71
2.5M                    68
2.3M                    67
37M                     67
31M                     67
2.9M                    67
35M                     65
```

```
                       ...
930k                     1
89k                      1
280k                     1
569k                     1
239k                     1
1,000+                   1
812k                     1
970k                     1
257k                     1
545k                     1
157k                     1
108k                     1
78k                      1
713k                     1
67k                      1
176k                     1
27k                      1
353k                     1
779k                     1
874k                     1
609k                     1
191k                     1
243k                     1
44k                      1
963k                     1
219k                     1
208k                     1
376k                     1
```

```
apps1.isnull().sum()
```

```
App                0
Category           0
Rating          1463
Reviews            1
Size               0
Installs           1
Type               1
Price              1
Content Rating     1
Genres             0
Last Updated       0
Current Ver        8
Android Ver        3
dtype: int64
```

```
apps1 = apps1.drop(apps1[apps1.Size.str.contains('Varies with device')].index,axis=0)
```

```
apps1['Size'] = apps1.Size.str.replace('M', 'e6')  #at first replace the string value 'M'
apps1['Size'] = apps1.Size.str.replace('k', 'e3')
```

```
apps1['Size']=pd.to_numeric(apps1.Size, errors = 'coerce')#convert the size to numeric val
```

```
apps1['Size'].value_counts()
```

```
11000000.0    182
12000000.0    181
13000000.0    177
14000000.0    177
15000000.0    164
26000000.0    143
17000000.0    143
10000000.0    139
16000000.0    137
19000000.0    130
21000000.0    124
20000000.0    123
18000000.0    119
25000000.0    119
24000000.0    117
22000000.0    104
23000000.0    103
29000000.0     92
27000000.0     92
28000000.0     90
30000000.0     83
3300000.0      73
33000000.0     71
2500000.0      68
37000000.0     67
31000000.0     67
2900000.0      67
2300000.0      67
35000000.0     65
2800000.0      65
              ...
569000.0        1
164000.0        1
695000.0        1
613000.0        1
847000.0        1
421000.0        1
186000.0        1
500000.0        1
716000.0        1
585000.0        1
924000.0        1
91000.0         1
55000.0         1
74000.0         1
629000.0        1
920000.0        1
280000.0        1
67000.0         1
190000.0        1
749000.0        1
253000.0        1
309000.0        1
511000.0        1
809000.0        1
940000.0        1
913000.0        1
429000.0        1
97000.0         1
412000.0        1
```

```
apps1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 8433 entries, 8872 to 10472
Data columns (total 13 columns):
App               8433 non-null object
Category          8433 non-null object
Rating            7028 non-null float64
Reviews           8432 non-null float64
Size              8432 non-null float64
Installs          8432 non-null float64
Type              8433 non-null object
Price             8432 non-null float64
Content Rating    8432 non-null object
Genres            8433 non-null object
Last Updated      8433 non-null object
Current Ver       8425 non-null object
Android Ver       8430 non-null object
dtypes: float64(5), object(8)
memory usage: 922.4+ KB
```

```
apps1['Category'].value_counts()
```

```
FAMILY                 1778
GAME                    844
TOOLS                   733
BUSINESS                375
MEDICAL                 369
PERSONALIZATION         351
LIFESTYLE               334
FINANCE                 299
PRODUCTIVITY            291
SPORTS                  287
COMMUNICATION           243
HEALTH_AND_FITNESS      232
PHOTOGRAPHY             222
NEWS_AND_MAGAZINES      201
BOOKS_AND_REFERENCE     194
SOCIAL                  189
TRAVEL_AND_LOCAL        173
SHOPPING                168
DATING                  158
VIDEO_PLAYERS           128
MAPS_AND_NAVIGATION     107
FOOD_AND_DRINK           88
LIBRARIES_AND_DEMO       81
EDUCATION                76
AUTO_AND_VEHICLES        75
HOUSE_AND_HOME           61
ART_AND_DESIGN           59
EVENTS                   57
WEATHER                  56
PARENTING                54
ENTERTAINMENT            53
COMICS                   49
BEAUTY                   47
1.9                       1
Name: Category, dtype: int64
```

```
apps1[apps1['Category'] == '1.9'] #drop the category '1.9'
```

App	Category	Rating	Reviews	Size	Installs	Type	Price	Content Rating
Life Made								

```
apps1.isnull().sum()
```

```
App                1
Category           0
Rating          1405
Reviews            1
Size               1
Installs           1
Type               0
Price              1
Content Rating     1
Genres             0
Last Updated       0
Current Ver        8
Android Ver        3
dtype: int64
```

```
apps1 = apps1.dropna(subset=['Rating']) #drop the null values of rating
```

```
apps1.isnull().sum()  #check the null value is present or not
```

```
App              0
Category         0
Rating           0
Reviews          1
Size             1
Installs         1
Type             0
Price            1
Content Rating   1
Genres           0
Last Updated     0
Current Ver      4
Android Ver      3
dtype: int64
```

```
apps1['Category'].value_counts()
```

```
FAMILY                1563
GAME                   803
TOOLS                  628
PERSONALIZATION        276
LIFESTYLE              269
MEDICAL                267
FINANCE                258
SPORTS                 223
PRODUCTIVITY           223
BUSINESS               221
PHOTOGRAPHY            204
HEALTH_AND_FITNESS     191
COMMUNICATION          189
```

```
SOCIAL                156
NEWS_AND_MAGAZINES    154
SHOPPING              146
BOOKS_AND_REFERENCE   141
TRAVEL_AND_LOCAL      141
DATING                121
VIDEO_PLAYERS         113
MAPS_AND_NAVIGATION    94
EDUCATION              75
FOOD_AND_DRINK         72
AUTO_AND_VEHICLES      63
LIBRARIES_AND_DEMO     61
ART_AND_DESIGN         57
ENTERTAINMENT          53
WEATHER                50
HOUSE_AND_HOME         49
COMICS                 47
PARENTING              44
EVENTS                 38
BEAUTY                 37
1.9                     1
Name: Category, dtype: int64
```

```
apps1.shape
```

```
(7028, 13)
```

```
apps1.head(2)
```

	App	Category	Rating	Reviews	Size	Installs	Type	Price
5776	Food-Aw - Order Food Online	FOOD_AND_DRINK	5.0	1.0	24000000.0	100.0	Free	0.0

```
apps1['Rating'].value_counts()
```

```
4.4    723
4.3    717
4.5    693
4.2    673
4.6    563
4.1    537
4.0    448
4.7    387
3.9    312
5.0    266
3.8    258
4.8    204
3.7    191
3.6    152
3.5    147
3.4    113
3.3     96
4.9     85
3.0     72
```

```
3.1      62
3.2      59
2.9      43
2.8      40
2.6      22
2.7      21
2.3      20
2.4      19
2.5      18
1.0      16
2.2      14
2.0      11
1.9      10
1.8       8
2.1       8
1.7       8
1.6       4
1.5       3
1.4       3
1.2       1
19.0      1
Name: Rating, dtype: int64
```

```
apps1.shape
```

```
(7028, 13)
```

```
apps1=apps1[['Category','Rating','Reviews','Size','Installs','Type','Price','Content Ratin
```

```
apps1.head()
```

	Category	Rating	Reviews	Size	Installs	Type	Price	Content Rating
5776	FOOD_AND_DRINK	5.0	1.0	24000000.0	100.0	Free	0.0	Everyone
9513	FAMILY	3.0	1.0	5800000.0	100.0	Free	0.0	Teen
9455	COMMUNICATION	5.0	1.0	25000000.0	10.0	Free	0.0	Teen
2533	MEDICAL	5.0	1.0	6100000.0	100.0	Free	0.0	Mature 17+

```
apps1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 7028 entries, 5776 to 10472
Data columns (total 9 columns):
Category          7028 non-null object
Rating            7028 non-null float64
Reviews           7027 non-null float64
Size              7027 non-null float64
Installs          7027 non-null float64
Type              7028 non-null object
Price             7027 non-null float64
Content Rating    7027 non-null object
Genres            7028 non-null object
```

```
dtypes: float64(5), object(4)
memory usage: 549.1+ KB
```

```
apps1.isnull().sum() #check null value is present or not
```

```
Category          0
Rating            0
Reviews           1
Size              1
Installs          1
Type              0
Price             1
Content Rating    1
Genres            0
dtype: int64
```

```
apps2 = apps1.dropna()  #drop the null values in apps1
apps2.head(2)
```

	Category	Rating	Reviews	Size	Installs	Type	Price	Content Rating
5776	FOOD_AND_DRINK	5.0	1.0	24000000.0	100.0	Free	0.0	Everyone
9513	FAMILY	3.0	1.0	5800000.0	100.0	Free	0.0	Teen

```
apps2.describe()
```

	Rating	Reviews	Size	Installs	Price
count	7027.000000	7.027000e+03	7.027000e+03	7.027000e+03	7027.000000
mean	4.160694	1.449036e+05	2.175764e+07	4.472719e+06	1.170729
std	0.558795	1.023887e+06	2.272703e+07	2.714306e+07	18.196934
min	1.000000	1.000000e+00	8.500000e+03	1.000000e+00	0.000000
25%	4.000000	8.400000e+01	4.900000e+06	1.000000e+04	0.000000
50%	4.300000	1.546000e+03	1.300000e+07	1.000000e+05	0.000000
75%	4.500000	2.657950e+04	3.100000e+07	1.000000e+06	0.000000
max	5.000000	4.488145e+07	1.000000e+08	1.000000e+09	400.000000

```
 le = LabelEncoder()
Category = le.fit_transform(apps2['Category'])
apps2 = apps2.drop('Category',axis = 1)

Gen = pd.factorize(apps2['Genres'])[0]
apps2 = apps2.drop('Genres',axis = 1)

con = pd.factorize(apps2['Content Rating'])[0]
apps2 = apps2.drop('Content Rating',axis = 1)

type2 = pd.factorize(apps2['Type'])[0]
```

```
apps2 = apps2.drop('Type',axis = 1)


apps2['Category']=Category
apps2['Genres']=Gen
apps2['Content Rating']=con
apps2['Type']=type2


apps2.head(2)
```

	Rating	Reviews	Size	Installs	Price	Category	Genres	Content Rating	Type
5776	5.0	1.0	24000000.0	100.0	0.0	13	0	0	0
9513	3.0	1.0	5800000.0	100.0	0.0	11	1	1	0

```
X = apps2.iloc[:, [1,3,5,6,7]] # Split data into training and testing sets
y = apps2.iloc[:, 0]


y = np.array(y)                      #multiply rating with the int 10 and covert it to the
for i in range(len(y)):
    y[i] = y[i]*10
    y[i] = int(y[i])
y = pd.to_numeric(y , downcast='signed')

y
```

```
array([50, 30, 50, ..., 46, 45, 46], dtype=int8)
```

```
X_train, X_test, y_train, y_test = train_test_split(X, y,test_size=0.2,random_state=11)


print (X_train.shape)
print (X_test.shape)
print (y_train.shape)
print (y_test.shape)
```

```
(5621, 5)
(1406, 5)
(5621,)
(1406,)
```

Using Gaussian Naive Bayes

```
from sklearn.naive_bayes import GaussianNB
gnb = GaussianNB()


from sklearn.preprocessing import StandardScaler   #Using StandardScaler to normalize feat
sc = StandardScaler()
X_train = sc.fit_transform(X_train)
```

```
X_test = sc.transform(X_test)
y_test.shape
y_test.reshape(1406,1)
y_train.reshape(5621,1)
```

```
array([[46],
       [38],
       [46],
       ...,
       [45],
       [42],
       [46]], dtype=int8)
```

```
gnb.fit(X_train,y_train)
```

```
GaussianNB(priors=None)
```

```
pred2 = gnb.predict(X_test)
```

```
from sklearn.metrics import r2_score
```

```
r2_score(y_test,pred2) #r2 score on the test data using GaussianNB
```

```
0.7694558507782752
```

Using Random Forest Classifier

```
from sklearn.ensemble import RandomForestClassifier
clf = RandomForestClassifier(random_state=42)
clf
```

```
RandomForestClassifier(bootstrap=True, class_weight=None, criterion='gini',
            max_depth=None, max_features='auto', max_leaf_nodes=None,
            min_impurity_decrease=0.0, min_impurity_split=None,
            min_samples_leaf=1, min_samples_split=2,
            min_weight_fraction_leaf=0.0, n_estimators=10, n_jobs=1,
            oob_score=False, random_state=42, verbose=0, warm_start=False)
```

```
clf.fit(X_train , y_train)
```

```
RandomForestClassifier(bootstrap=True, class_weight=None, criterion='gini',
            max_depth=None, max_features='auto', max_leaf_nodes=None,
            min_impurity_decrease=0.0, min_impurity_split=None,
            min_samples_leaf=1, min_samples_split=2,
            min_weight_fraction_leaf=0.0, n_estimators=10, n_jobs=1,
            oob_score=False, random_state=42, verbose=0, warm_start=False)
```

```
pred = clf.predict(X_test)
```

```
from sklearn.metrics import r2_score
```

r2 score on test data

```
r2_score(y_test,pred)  #r2 score on test data using RandomForestClassifier
```

```
0.5619496018548531
```

Data Visualization

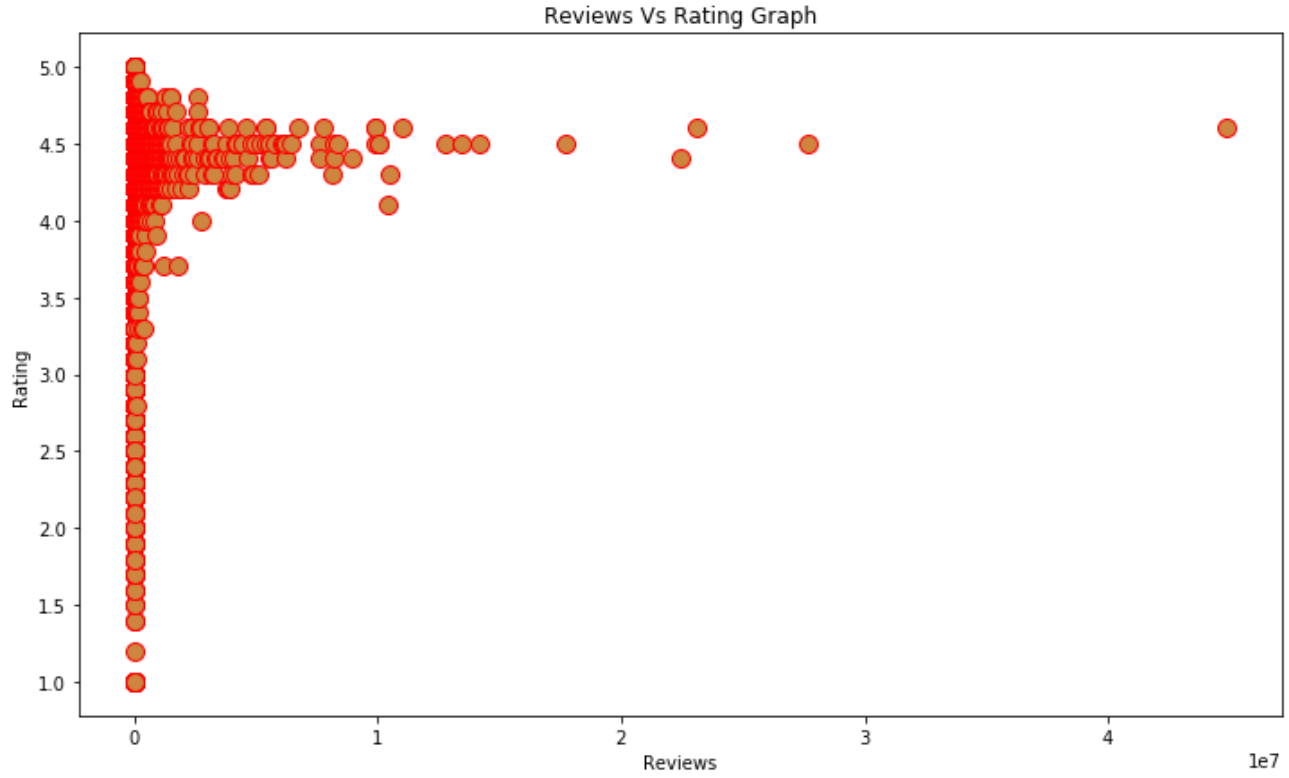
```
pd.scatter_matrix(apps2.loc[:,'Rating':'Price'],figsize=(15,8))
```

```
C:\ProgramData\Anaconda3\lib\site-packages\ipykernel_launcher.py:1: FutureWarning: pa
  """Entry point for launching an IPython kernel.
array([[<matplotlib.axes._subplots.AxesSubplot object at 0x000001B78645A550>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x000001B786463668>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x000001B78645CA58>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x000001B786467908>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x000001B7866AB7B8>],
       [<matplotlib.axes._subplots.AxesSubplot object at 0x000001B7866AB7F0>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x000001B789201208>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x000001B789227EB8>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x000001B78926A048>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x000001B7892A3048>],
       [<matplotlib.axes._subplots.AxesSubplot object at 0x000001B7892DA0B8>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x000001B7892F0048>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x000001B78933C278>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x000001B789371278>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x000001B7893A97B8>]
```

```
plt.figure(figsize=(12,7))
plt.scatter(apps2['Reviews'],apps2['Rating'],c="peru",s=100,edgecolors="r",linewidths=1)

plt.xlabel('Reviews')
plt.ylabel('Rating')
plt.title('Reviews Vs Rating Graph')
```

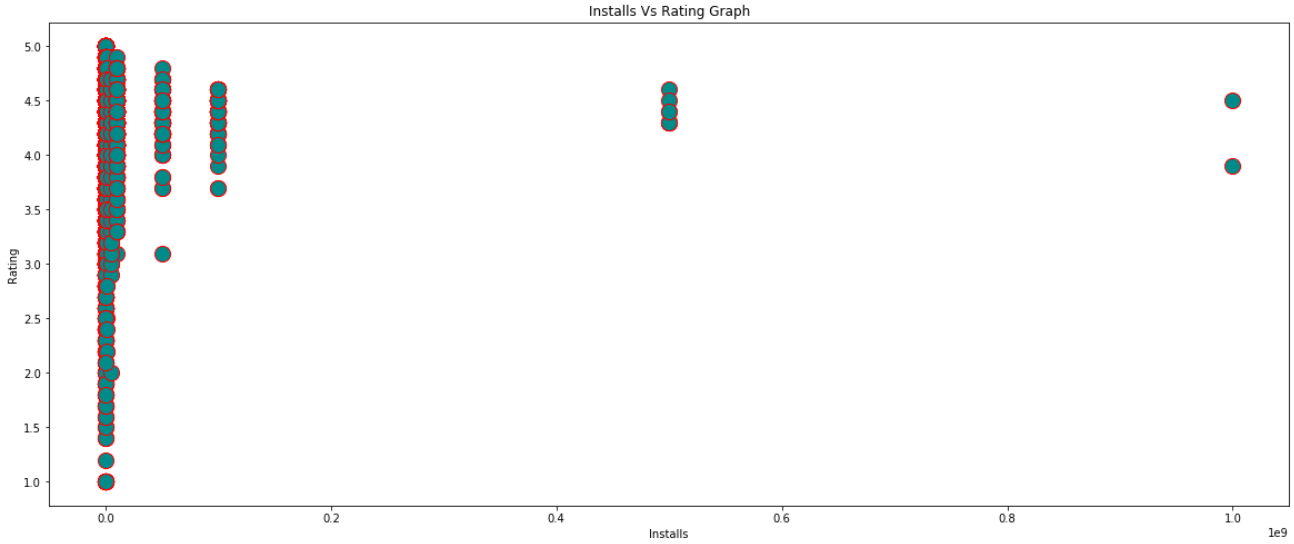
```
Text(0.5,1,'Reviews Vs Rating Graph')
```




```
plt.figure(figsize=(20,8))
plt.scatter(apps2['Installs'],apps2['Rating'],c="darkcyan",s=200,edgecolors="r",linewidths

plt.xlabel('Installs')
plt.ylabel('Rating')
plt.title('Installs Vs Rating Graph')
```

```
Text(0.5,1,'Installs Vs Rating Graph')
```




```
plt.figure(figsize=(10,7))
plt.scatter(apps2['Installs'],apps2['Reviews'],c="plum",s=100,edgecolors="r",linewidths=1)

plt.xlabel('Installs')
plt.ylabel('Reviews')
plt.title('Reviews Vs Installs Graph')
```

```
Text(0.5,1,'Reviews Vs Installs Graph')
```


```
plt.figure(figsize=(12,7))
temp=apps2.corr()
sns.heatmap(temp,
            xticklabels=temp.columns.values,
            yticklabels=temp.columns.values,
            annot=True)
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x1b7897a3390>
```