# EDA & Pre-Processing on gplay Dataset :

Importing required Libraries :

In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.preprocessing import LabelEncoder
from scipy.stats import skew
```

```
/usr/local/lib/python3.6/dist-packages/statsmodels/tools/_testing.py:19: FutureWarning: pandas.util.testing is deprecat
ed. Use the functions in the public API at pandas.testing instead.
  import pandas.util.testing as tm
```

Code for getting CSV file :

In [2]:
```
from google.colab import files
uploaded = files.upload()
```

Choose Files No file chosen

Upload widget is only available when the cell has been executed in the current browser session. Please rerun this cell to enable.

```
Saving gplay.csv to gplay.csv
```

In [3]:
```
df = pd.read_csv("gplay.csv")
```

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

Out[4]:

| | Unnamed: 0 | App | Category | Rating | Reviews | Size | Installs | Type | Price | Content Rating |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 0 | Photo Editor & Candy Camera & Grid & ScrapBook | ART_AND_DESIGN | 4.1 | 159 | 19M | 10,000+ | Free | 0 | Everyone |
| **1** | 1 | Coloring book moana | ART_AND_DESIGN | 3.9 | 967 | 14M | 500,000+ | Free | 0 | Everyone |
| **2** | 2 | U Launcher Lite – FREE Live Cool Themes, Hide ... | ART_AND_DESIGN | 4.7 | 87510 | 8.7M | 5,000,000+ | Free | 0 | Everyone |
| **3** | 3 | Sketch - Draw & Paint | ART_AND_DESIGN | 4.5 | 215644 | 25M | 50,000,000+ | Free | 0 | Teen |
| **4** | 4 | Pixel Draw - Number Art Coloring Book | ART_AND_DESIGN | 4.3 | 967 | 2.8M | 100,000+ | Free | 0 | Everyone |

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

Out[5]:

| | Unnamed: 0 | App | Category | Rating | Reviews | Size | Installs | Type | Price | Content Rating |
|---|---|---|---|---|---|---|---|---|---|---|
| **10836** | 10836 | Sya9a Maroc - FR | FAMILY | 4.5 | 38 | 53M | 5,000+ | Free | 0 | Everyone |
| **10837** | 10837 | Fr. Mike Schmitz Audio Teachings | FAMILY | 5.0 | 4 | 3.6M | 100+ | Free | 0 | Everyone |
| **10838** | 10838 | Parkinson Exercices FR | MEDICAL | NaN | 3 | 9.5M | 1,000+ | Free | 0 | Everyone |
| **10839** | 10839 | The SCP Foundation DB fr nn5n | BOOKS_AND_REFERENCE | 4.5 | 114 | Varies with device | 1,000+ | Free | 0 | Mature 17+ |
| **10840** | 10840 | iHoroscope - 2018 Daily Horoscope & Astrology | LIFESTYLE | 4.5 | 398307 | 19M | 10,000,000+ | Free | 0 | Everyone |

Dropping the Unnammed Column :

In [7]:
```
df.drop(["Unnamed: 0"], axis=1,inplace = True)
```

In [8]:
```
df.head()
```

Out[8]:

| | App | Category | Rating | Reviews | Size | Installs | Type | Price | Content Rating |
|---|---|---|---|---|---|---|---|---|---|
| **0** | Photo Editor & Candy Camera & Grid & ScrapBook | ART_AND_DESIGN | 4.1 | 159 | 19M | 10,000+ | Free | 0 | Everyone |
| **1** | Coloring book moana | ART_AND_DESIGN | 3.9 | 967 | 14M | 500,000+ | Free | 0 | Everyone |
| **2** | U Launcher Lite – FREE Live Cool Themes, Hide ... | ART_AND_DESIGN | 4.7 | 87510 | 8.7M | 5,000,000+ | Free | 0 | Everyone |
| **3** | Sketch - Draw & Paint | ART_AND_DESIGN | 4.5 | 215644 | 25M | 50,000,000+ | Free | 0 | Teen |
| **4** | Pixel Draw - Number Art Coloring Book | ART_AND_DESIGN | 4.3 | 967 | 2.8M | 100,000+ | Free | 0 | Everyone |

Handling Missing Values :

In [9]:
```
df.isnull().sum()
```

Out[9]:
```
App                0
Category           0
Rating          1474
Reviews            0
Size               0
Installs           0
Type               1
Price              0
Content Rating     1
dtype: int64
```

Replacing null values with mean value of rating

In [11]:
```
df["Rating"].fillna(df["Rating"].mean(),inplace = True)
```

In [13]:
```
df["Type"].value_counts()
```

Out[13]:
```
Free    10039
Paid      800
0           1
Name: Type, dtype: int64
```

In [18]:
```
df["Type"].fillna("Free",inplace = True)
```

In [19]:
```
df["Content Rating"].value_counts()
```

Out[19]:
```
Everyone           8715
Teen               1208
Mature 17+          499
Everyone 10+        414
Adults only 18+       3
Unrated               2
Name: Content Rating, dtype: int64
```

In [20]:
```
df["Content Rating"].fillna("Everyone",inplace = True)
```

In [21]:
```
df.isnull().sum()
```

Out[21]:
```
App              0
Category         0
Rating           0
Reviews          0
Size             0
Installs         0
Type             0
Price            0
Content Rating   0
dtype: int64
```

Identifying Data Types and conversion as per requirement

In [22]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10841 entries, 0 to 10840
Data columns (total 9 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   App             10841 non-null  object 
 1   Category        10841 non-null  object 
 2   Rating          10841 non-null  float64
 3   Reviews         10841 non-null  object 
 4   Size            10841 non-null  object 
 5   Installs        10841 non-null  object 
 6   Type            10841 non-null  object 
 7   Price           10841 non-null  object 
 8   Content Rating  10841 non-null  object 
dtypes: float64(1), object(8)
memory usage: 762.4+ KB
```

Review Column

In [24]:
```
df["Reviews"].unique()
```

Out[24]:
```
array(['159', '967', '87510', ..., '603', '1195', '398307'], dtype=object)
```

In [23]:
```
for data in df["Reviews"]:
    if not(str(data).isnumeric()):
        print(data)
```

```
3.0M
```

In [25]:
```
df[df["Reviews"] == "3.0M"]
```

Out[25]:

| | App | Category | Rating | Reviews | Size | Installs | Type | Price | Content Rating |
|---|---|---|---|---|---|---|---|---|---|
| **10472** | Life Made WI-Fi Touchscreen Photo Frame | 1.9 | 19.0 | 3.0M | 1,000+ | Free | 0 | Everyone | Everyone |

In [26]:
```
df.drop(10472,inplace=True)
```

In [27]:
```
df["Reviews"] = df["Reviews"].astype(int)
```

Install column

In [29]:
```
def clean_installs(x):
    x = str(x)
    x = x.replace(",","")
    x = x.replace("+","")
    return int(x)
```

In [31]:
```
df["Installs"] = df["Installs"].map(clean_installs)
```

In [32]:
```
df.head()
```

Out[32]:

| | App | Category | Rating | Reviews | Size | Installs | Type | Price | Content Rating |
|---|---|---|---|---|---|---|---|---|---|
| **0** | Photo Editor & Candy Camera & Grid & ScrapBook | ART_AND_DESIGN | 4.1 | 159 | 19M | 10000 | Free | 0 | Everyone |
| **1** | Coloring book moana | ART_AND_DESIGN | 3.9 | 967 | 14M | 500000 | Free | 0 | Everyone |
| **2** | U Launcher Lite – FREE Live Cool Themes, Hide ... | ART_AND_DESIGN | 4.7 | 87510 | 8.7M | 5000000 | Free | 0 | Everyone |
| **3** | Sketch - Draw & Paint | ART_AND_DESIGN | 4.5 | 215644 | 25M | 50000000 | Free | 0 | Teen |
| **4** | Pixel Draw - Number Art Coloring Book | ART_AND_DESIGN | 4.3 | 967 | 2.8M | 100000 | Free | 0 | Everyone |

Price Column

In [33]:
```
df["Price"].unique()
```

Out[33]:
```
array(['0', '$4.99', '$3.99', '$6.99', '$1.49', '$2.99', '$7.99', '$5.99',
       '$3.49', '$1.99', '$9.99', '$7.49', '$0.99', '$9.00', '$5.49',
       '$10.00', '$24.99', '$11.99', '$79.99', '$16.99', '$14.99',
       '$1.00', '$29.99', '$12.99', '$2.49', '$10.99', '$1.50', '$19.99',
       '$15.99', '$33.99', '$74.99', '$39.99', '$3.95', '$4.49', '$1.70',
       '$8.99', '$2.00', '$3.88', '$25.99', '$399.99', '$17.99',
       '$400.00', '$3.02', '$1.76', '$4.84', '$4.77', '$1.61', '$2.50',
       '$1.59', '$6.49', '$1.29', '$5.00', '$13.99', '$299.99', '$379.99',
       '$37.99', '$18.99', '$389.99', '$19.90', '$8.49', '$1.75',
       '$14.00', '$4.85', '$46.99', '$109.99', '$154.99', '$3.08',
       '$2.59', '$4.80', '$1.96', '$19.40', '$3.90', '$4.59', '$15.46',
       '$3.04', '$4.29', '$2.60', '$3.28', '$4.60', '$28.99', '$2.95',
       '$2.90', '$1.97', '$200.00', '$89.99', '$2.56', '$30.99', '$3.61',
       '$394.99', '$1.26', '$1.20', '$1.04'], dtype=object)
```

In [34]:
```
def clean_price(x):
    x = str(x)
    x = x.replace("$","")
    return float(x)
```

In [35]:
```
df["Price"] = df["Price"].map(clean_price)
```

In [36]:
```
df["Price"].unique()
```

Out[36]:
```
array([  0.  ,   4.99,   3.99,   6.99,   1.49,   2.99,   7.99,   5.99,
         3.49,   1.99,   9.99,   7.49,   0.99,   9.  ,   5.49,  10.  ,
        24.99,  11.99,  79.99,  16.99,  14.99,   1.  ,  29.99,  12.99,
         2.49,  10.99,   1.5 ,  19.99,  15.99,  33.99,  74.99,  39.99,
         3.95,   4.49,   1.7 ,   8.99,   2.  ,   3.88,  25.99, 399.99,
        17.99, 400.  ,   3.02,   1.76,   4.84,   4.77,   1.61,   2.5 ,
         1.59,   6.49,   1.29,   5.  ,  13.99, 299.99, 379.99,  37.99,
        18.99, 389.99,  19.9 ,   8.49,   1.75,  14.  ,   4.85,  46.99,
       109.99, 154.99,   3.08,   2.59,   4.8 ,   1.96,  19.4 ,   3.9 ,
         4.59,  15.46,   3.04,   4.29,   2.6 ,   3.28,   4.6 ,  28.99,
         2.95,   2.9 ,   1.97, 200.  ,  89.99,   2.56,  30.99,   3.61,
       394.99,   1.26,   1.2 ,   1.04])
```

Size Column

In [37]:
```
df["Size"].unique()
```

Out[37]:
```
array(['19M', '14M', '8.7M', '25M', '2.8M', '5.6M', '29M', '33M', '3.1M',
       '28M', '12M', '20M', '21M', '37M', '2.7M', '5.5M', '17M', '39M',
       '31M', '4.2M', '7.0M', '23M', '6.0M', '6.1M', '4.6M', '9.2M',
       '5.2M', '11M', '24M', 'Varies with device', '9.4M', '15M', '10M',
       '1.2M', '26M', '8.0M', '7.9M', '56M', '57M', '35M', '54M', '201k',
       '3.6M', '5.7M', '8.6M', '2.4M', '27M', '2.5M', '16M', '3.4M',
       '8.9M', '3.9M', '2.9M', '38M', '32M', '5.4M', '18M', '1.1M',
       '2.2M', '4.5M', '9.8M', '52M', '9.0M', '6.7M', '30M', '2.6M',
       '7.1M', '3.7M', '22M', '7.4M', '6.4M', '3.2M', '8.2M', '9.9M',
       '4.9M', '9.5M', '5.0M', '5.9M', '13M', '73M', '6.8M', '3.5M',
       '4.0M', '2.3M', '7.2M', '2.1M', '42M', '7.3M', '9.1M', '55M',
       '23k', '6.5M', '1.5M', '7.5M', '51M', '41M', '48M', '8.5M', '46M',
       '8.3M', '4.3M', '4.7M', '3.3M', '40M', '7.8M', '8.8M', '6.6M',
       '5.1M', '61M', '66M', '79k', '8.4M', '118k', '44M', '695k', '1.6M',
       '6.2M', '18k', '53M', '1.4M', '3.0M', '5.8M', '3.8M', '9.6M',
       '45M', '63M', '49M', '77M', '4.4M', '4.8M', '70M', '6.9M', '9.3M',
       '10.0M', '8.1M', '36M', '84M', '97M', '2.0M', '1.9M', '1.8M',
       '5.3M', '47M', '556k', '526k', '76M', '7.6M', '59M', '9.7M', '78M',
       '72M', '43M', '7.7M', '6.3M', '334k', '34M', '93M', '65M', '79M',
       '100M', '58M', '50M', '68M', '64M', '67M', '60M', '94M', '232k',
       '99M', '624k', '95M', '8.5k', '41k', '292k', '11k', '80M', '1.7M',
       '74M', '62M', '69M', '75M', '98M', '85M', '82M', '96M', '87M',
       '71M', '86M', '91M', '81M', '92M', '83M', '88M', '704k', '862k',
       '899k', '378k', '266k', '375k', '1.3M', '975k', '980k', '4.1M',
       '89M', '696k', '544k', '525k', '920k', '779k', '853k', '720k',
       '713k', '772k', '318k', '58k', '241k', '196k', '857k', '51k',
       '953k', '865k', '251k', '930k', '540k', '313k', '746k', '203k',
       '26k', '314k', '239k', '371k', '220k', '730k', '756k', '91k',
       '293k', '17k', '74k', '14k', '317k', '78k', '924k', '902k', '818k',
       '81k', '939k', '169k', '45k', '475k', '965k', '90M', '545k', '61k',
       '283k', '655k', '714k', '93k', '872k', '121k', '322k', '1.0M',
       '976k', '172k', '238k', '549k', '206k', '954k', '444k', '717k',
       '210k', '609k', '308k', '705k', '306k', '904k', '473k', '175k',
       '350k', '383k', '454k', '421k', '70k', '812k', '442k', '842k',
       '417k', '412k', '459k', '478k', '335k', '782k', '721k', '430k',
       '429k', '192k', '200k', '460k', '728k', '496k', '816k', '414k',
       '506k', '887k', '613k', '243k', '569k', '778k', '683k', '592k',
       '319k', '186k', '840k', '647k', '191k', '373k', '437k', '598k',
       '716k', '585k', '982k', '222k', '219k', '55k', '948k', '323k',
```

```
       '691k', '511k', '951k', '963k', '25k', '554k', '351k', '27k',
       '82k', '208k', '913k', '514k', '551k', '29k', '103k', '898k',
       '743k', '116k', '153k', '209k', '353k', '499k', '173k', '597k',
       '809k', '122k', '411k', '400k', '801k', '787k', '237k', '50k',
       '643k', '986k', '97k', '516k', '837k', '780k', '961k', '269k',
       '20k', '498k', '600k', '749k', '642k', '881k', '72k', '656k',
       '601k', '221k', '228k', '108k', '940k', '176k', '33k', '663k',
       '34k', '942k', '259k', '164k', '458k', '245k', '629k', '28k',
       '288k', '775k', '785k', '636k', '916k', '994k', '309k', '485k',
       '914k', '903k', '608k', '500k', '54k', '562k', '847k', '957k',
       '688k', '811k', '270k', '48k', '329k', '523k', '921k', '874k',
       '981k', '784k', '280k', '24k', '518k', '754k', '892k', '154k',
       '860k', '364k', '387k', '626k', '161k', '879k', '39k', '970k',
       '170k', '141k', '160k', '144k', '143k', '190k', '376k', '193k',
       '246k', '73k', '658k', '992k', '253k', '420k', '404k', '470k',
       '226k', '240k', '89k', '234k', '257k', '861k', '467k', '157k',
       '44k', '676k', '67k', '552k', '885k', '1020k', '582k', '619k'],
      dtype=object)
```

In [38]:
```
def clean_size(x):
    x = str(x)

    if x == "Varies with device":
        return np.nan
    elif x[-1] == "M":
        return float(x[:-1])
    else:
        x = float(x[:-1])
        return x/1000
```

In [39]:
```
df["Size"] = df["Size"].map(clean_size)
```

In [40]:
```
df["Size"].fillna(df["Size"].mean(), inplace=True)
```

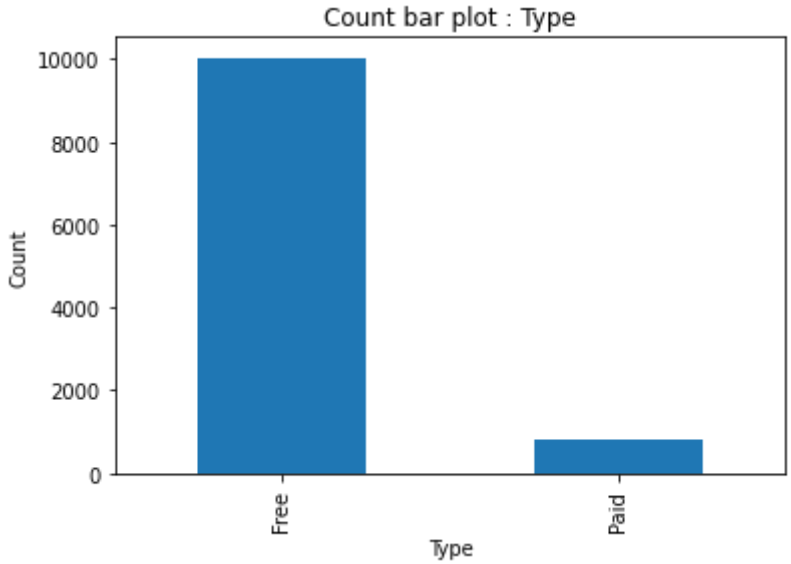
In [41]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 10840 entries, 0 to 10840
Data columns (total 9 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   App             10840 non-null  object 
 1   Category        10840 non-null  object 
 2   Rating          10840 non-null  float64
 3   Reviews         10840 non-null  int64  
 4   Size            10840 non-null  float64
 5   Installs        10840 non-null  int64  
 6   Type            10840 non-null  object 
 7   Price           10840 non-null  float64
 8   Content Rating  10840 non-null  object 
dtypes: float64(3), int64(2), object(4)
memory usage: 846.9+ KB
```

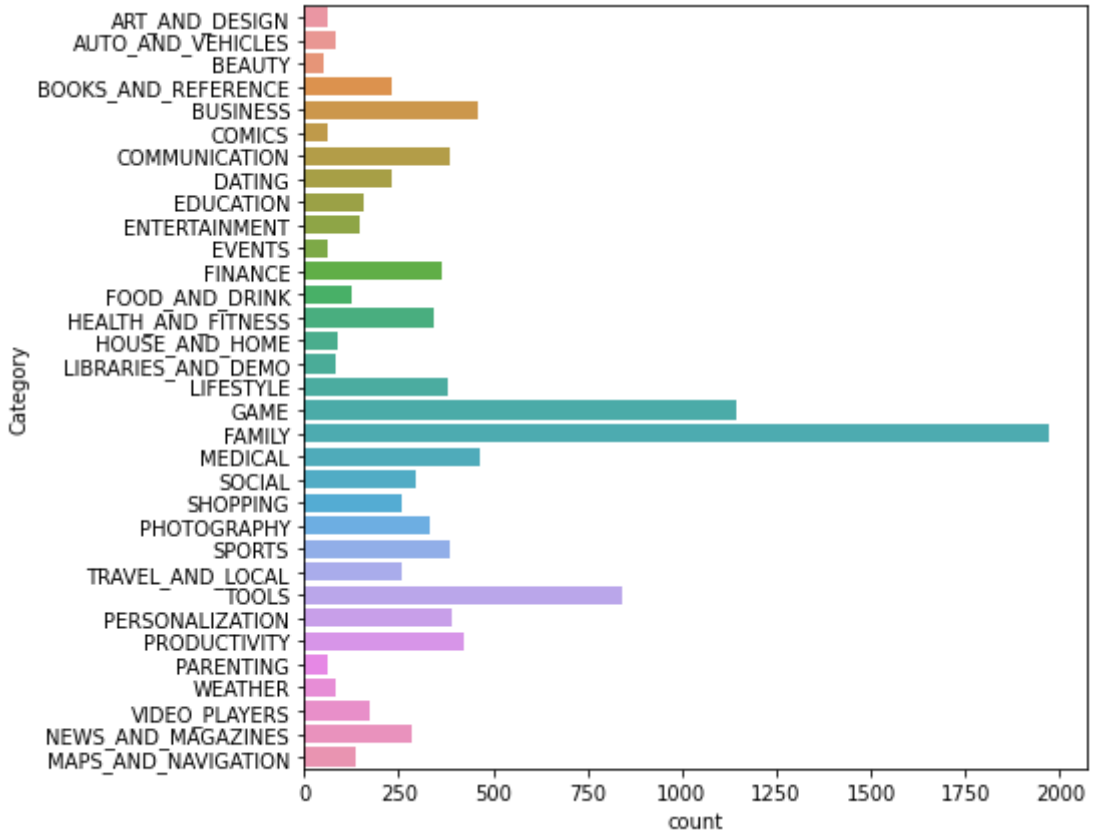
In [ ]:
```

```

**Visualization**

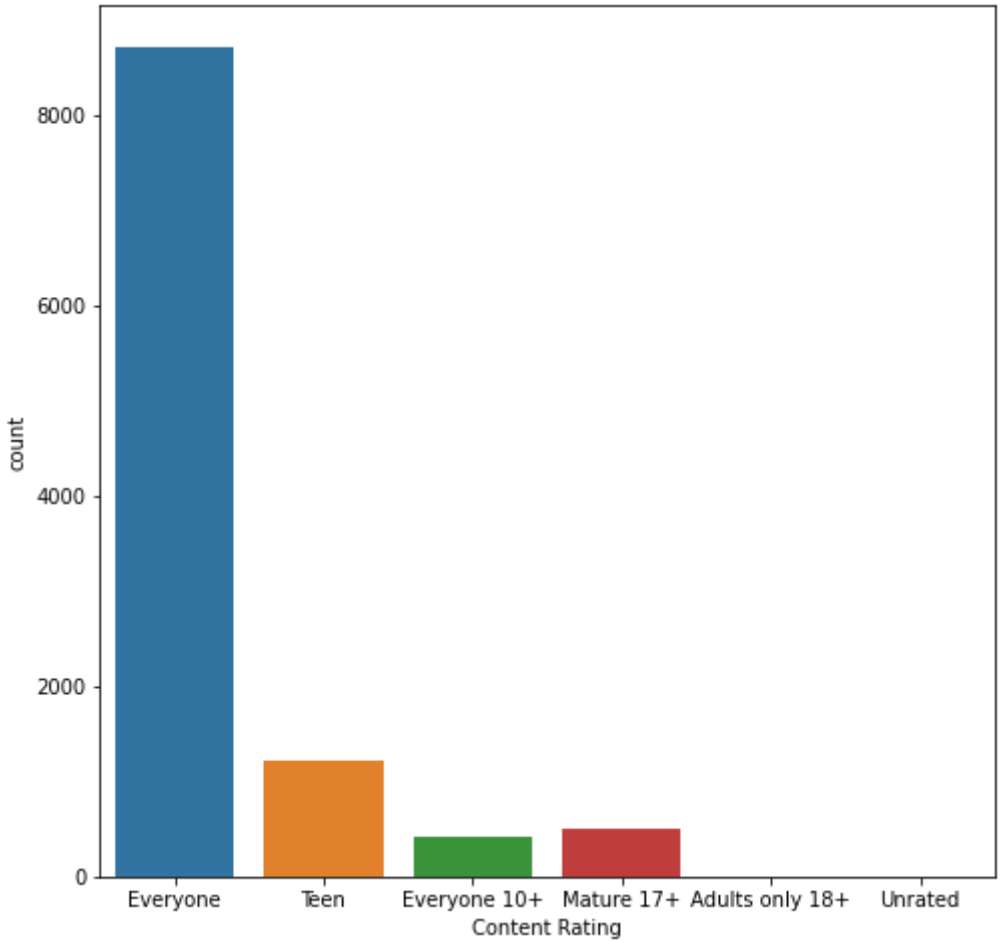
In [45]:
```
plt.figure()
df["Type"].value_counts().plot(kind="bar")
plt.title("Count bar plot : Type")
plt.xlabel("Type")
plt.ylabel("Count")
plt.show()
```



In [54]:
```
plt.figure(figsize=(7,7))
sns.countplot(data=df, y="Category")
plt.show()
```

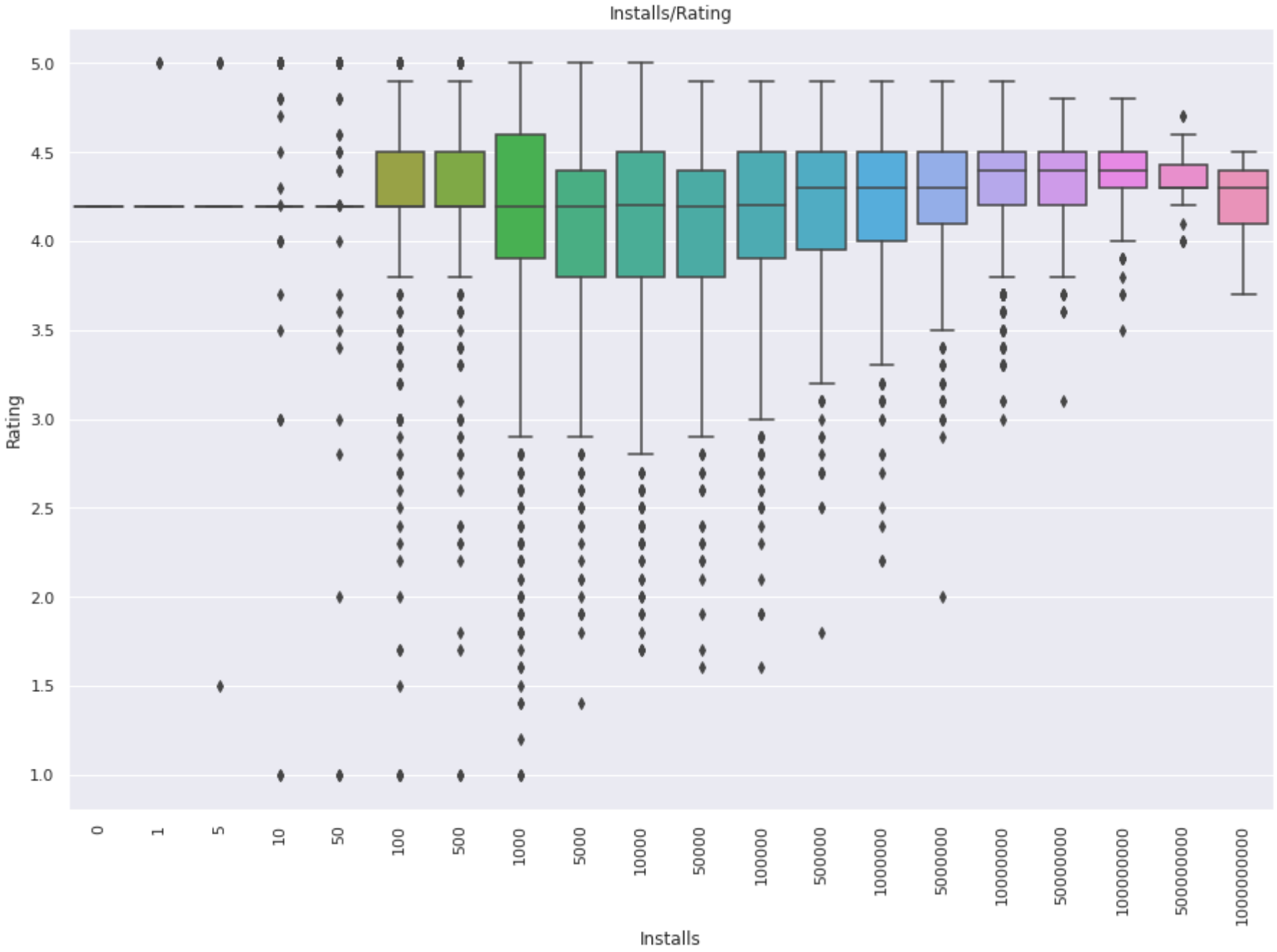


In [57]:
```
plt.figure(figsize = (8,8))
sns.countplot(df['Content Rating'])
plt.show()
```

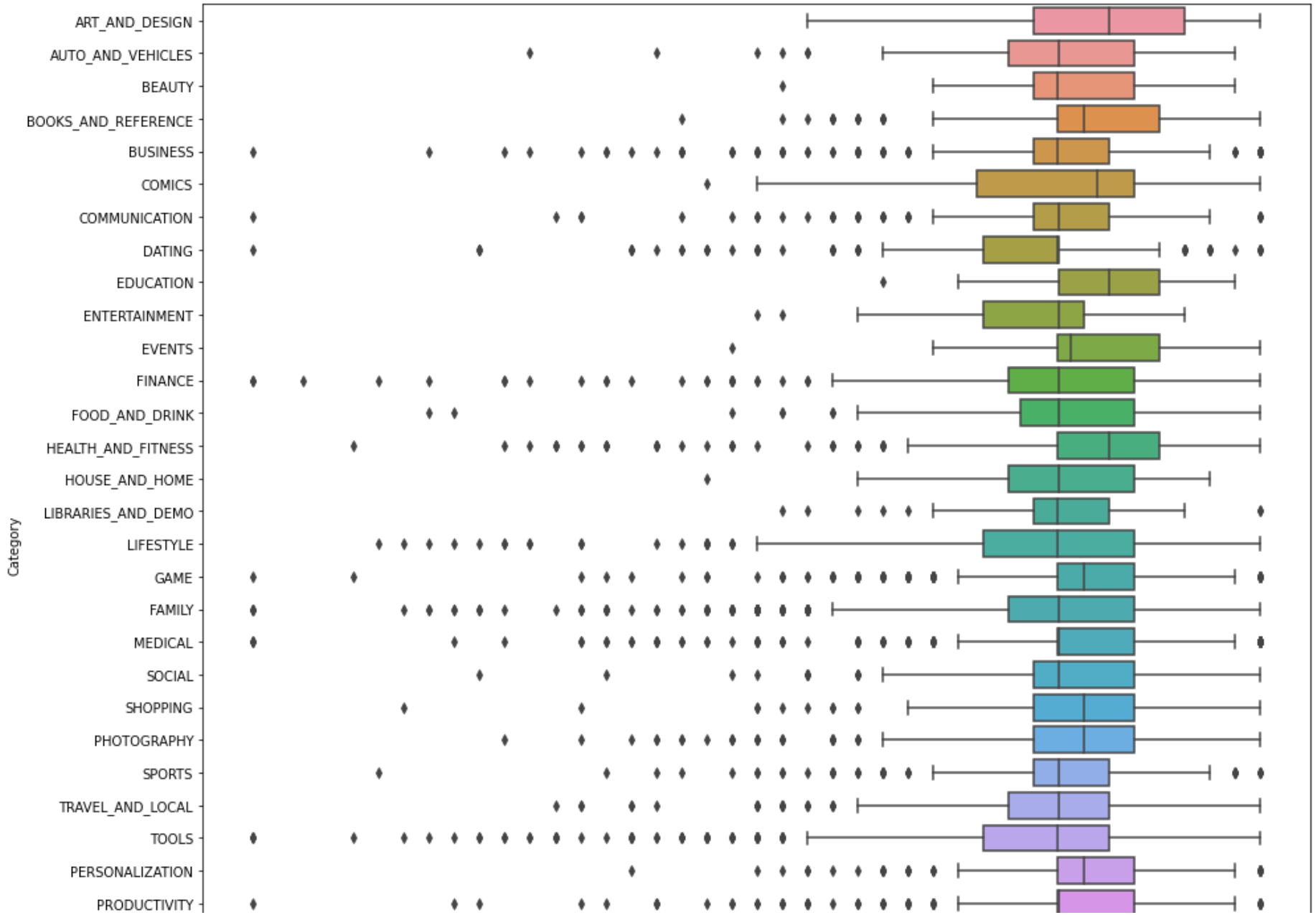


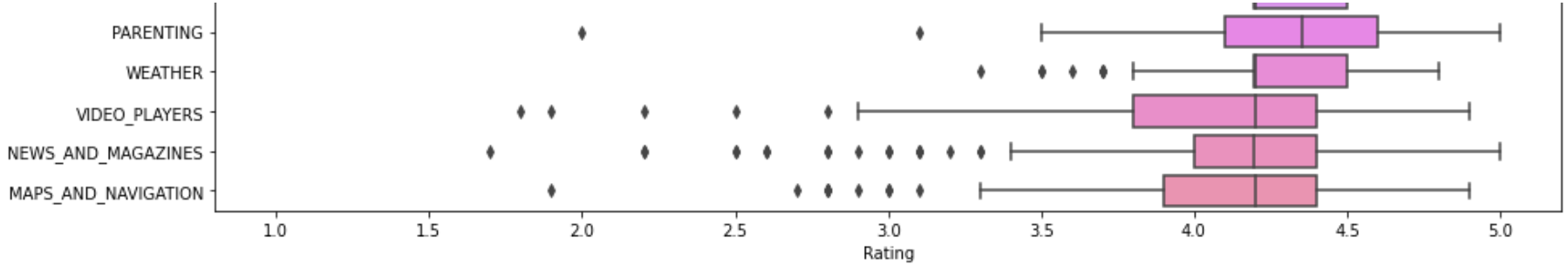
Outliars

In [63]:
```
plt.figure(figsize=(15,10))
sns.set()
sns.boxplot(x="Installs", y="Rating", data=df)
plt.title("Installs/Rating")
plt.xticks(rotation=90)
plt.show()
```

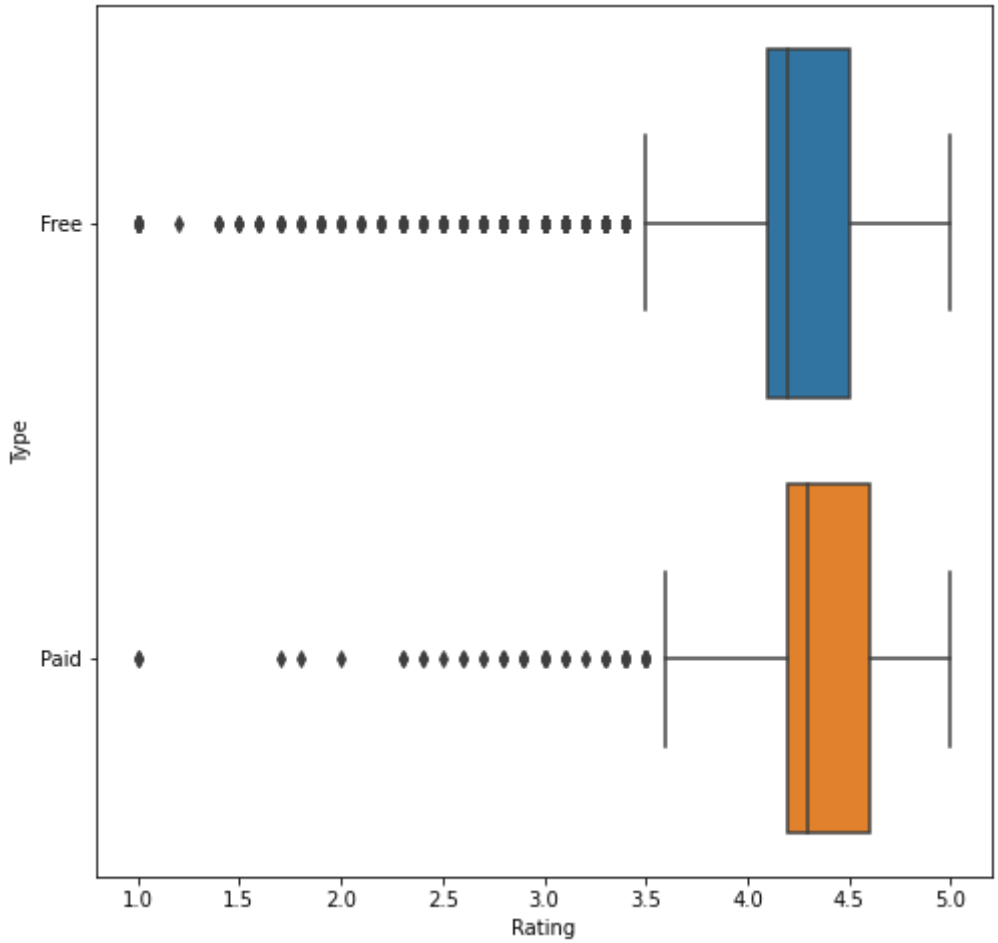

Installs/Rating
Rating
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0
1
5
10
50
100
500
1000
5000
10000
50000
100000
500000
1000000
5000000
10000000
50000000
100000000
500000000
1000000000
Installs

In [58]:
```
plt.figure(figsize=(15,15))
sns.boxplot(data=df,x="Rating",y="Category")
plt.show()
```




PARENTING
WEATHER
VIDEO_PLAYERS
NEWS_AND_MAGAZINES
MAPS_AND_NAVIGATION
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Rating

In [61]:
```
plt.figure(figsize = (8,8))
sns.boxplot(y='Type', x='Rating', data=df)
plt.show()
```




In [64]:
```
df[(df["Category"] == "EDUCATION") & (df["Rating"] < 3.8)]
```

Out[64]:

| | App | Category | Rating | Reviews | Size | Installs | Type | Price | Content Rating |
|---|---|---|---|---|---|---|---|---|---|
| **841** | EasyBib: Citation Generator | EDUCATION | 3.5 | 1405 | 7.3 | 100000 | Free | 0.0 | Everyone |

In [65]:
```
df.drop(841,inplace=True)
```

In [66]:
```
df[(df["Category"] == "EVENTS") & (df["Rating"] < 3.5)]
```

Out[66]:

| | App | Category | Rating | Reviews | Size | Installs | Type | Price | Content Rating |
|---|---|---|---|---|---|---|---|---|---|
| **5987** | Outdoor Movies BC | EVENTS | 2.9 | 7 | 21.51653 | 500 | Free | 0.0 | Everyone |

In [67]:
```
df.drop(5987,inplace=True)
```

In [68]:
```
df[(df["Category"] == "ENTERTAINMENT") & (df["Rating"] < 3.4)]
```

Out[68]:

| | App | Category | Rating | Reviews | Size | Installs | Type | Price | Content Rating |
|---|---|---|---|---|---|---|---|---|---|
| **862** | Digital TV | ENTERTAINMENT | 3.1 | 5241 | 21.51653 | 5000000 | Free | 0.0 | Everyone |
| **915** | Acorn TV: World-class TV from Britain and Beyond | ENTERTAINMENT | 3.0 | 493 | 23.00000 | 50000 | Free | 0.0 | Everyone |

In [70]:
```
df.drop([862,915],inplace=True)
```

Correlation

In [72]:
```
cor = df.corr()
```

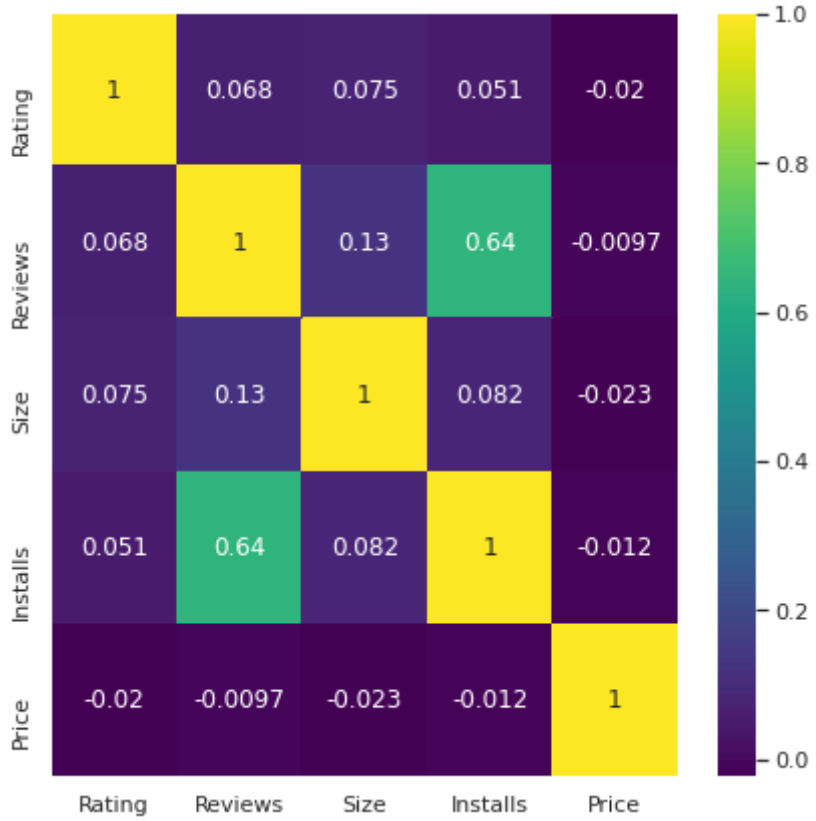
In [73]:
```
cor
```

Out[73]:

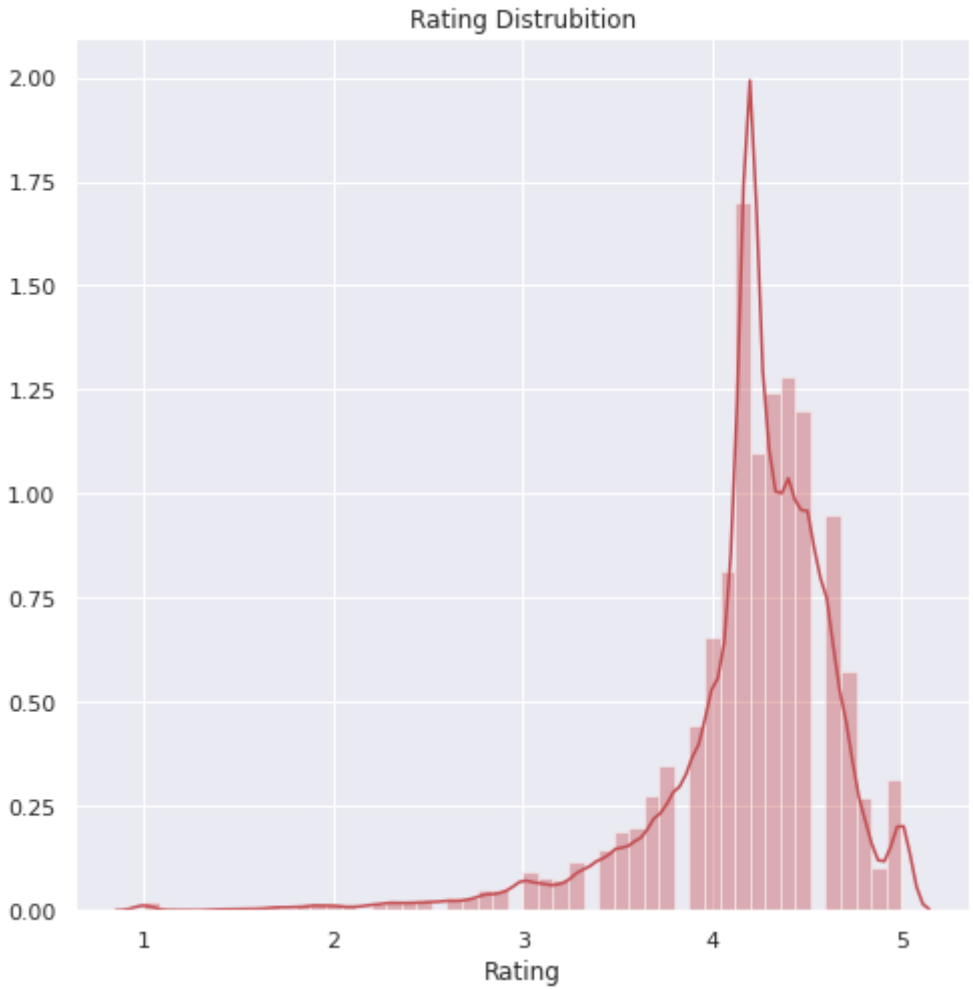
| | Rating | Reviews | Size | Installs | Price |
|---|---|---|---|---|---|
| **Rating** | 1.000000 | 0.067891 | 0.074697 | 0.051051 | -0.020250 |
| **Reviews** | 0.067891 | 1.000000 | 0.128251 | 0.643119 | -0.009671 |
| **Size** | 0.074697 | 0.128251 | 1.000000 | 0.082218 | -0.022997 |
| **Installs** | 0.051051 | 0.643119 | 0.082218 | 1.000000 | -0.011694 |
| **Price** | -0.020250 | -0.009671 | -0.022997 | -0.011694 | 1.000000 |

Correlation Using Heatmap

In [76]:
```
plt.figure(figsize=(7,7))
sns.heatmap(df.corr(),annot=True,cmap="viridis")
plt.show()
```



In [78]:
```
plt.figure(figsize=(8,8))
sns.distplot(df['Rating'],color='r');
plt.title("Rating Distrubition")
plt.show()
```

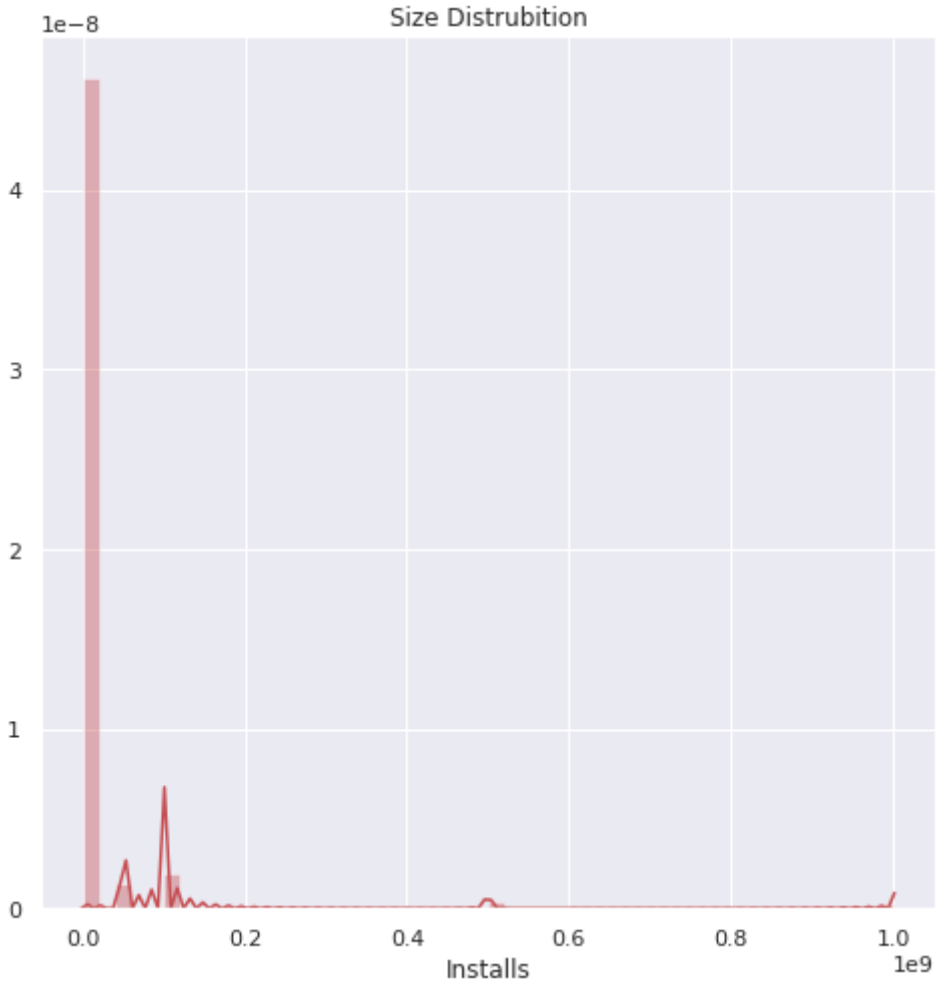


## Skewness

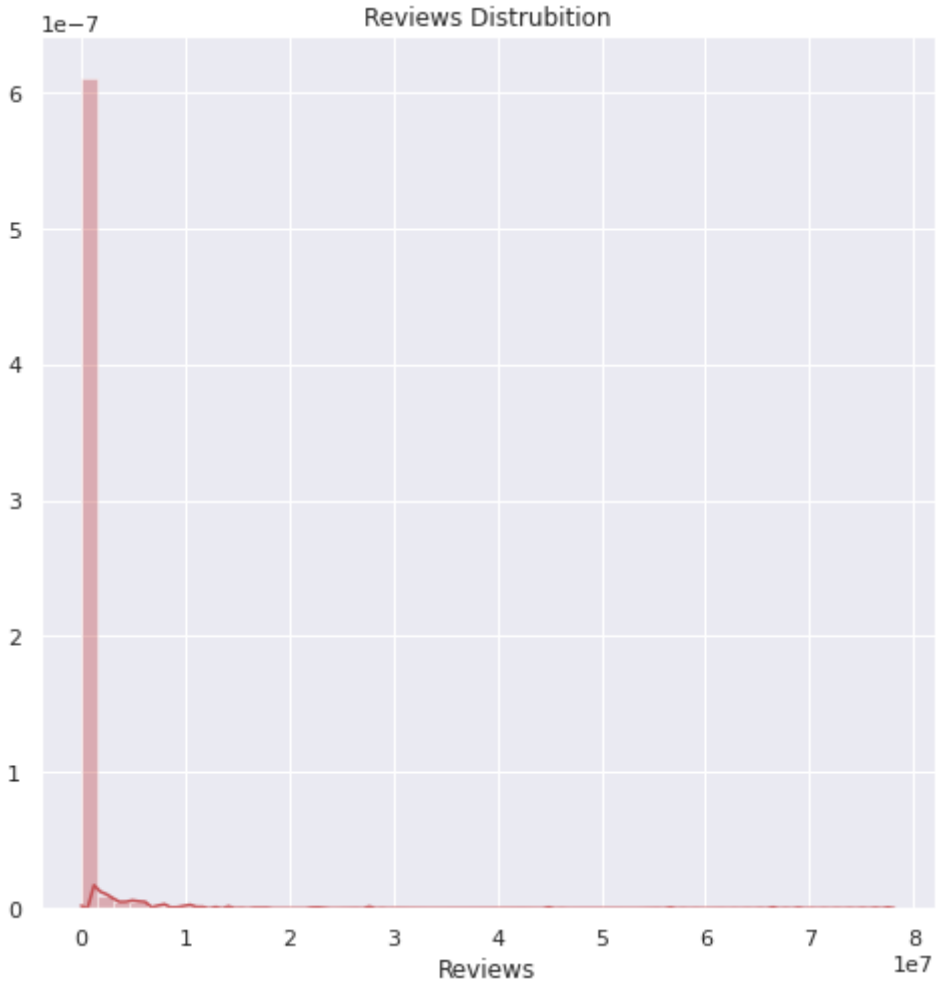
In [79]:
```
skew(df["Rating"])
```

Out[79]:
```
-1.9941716003955778
```

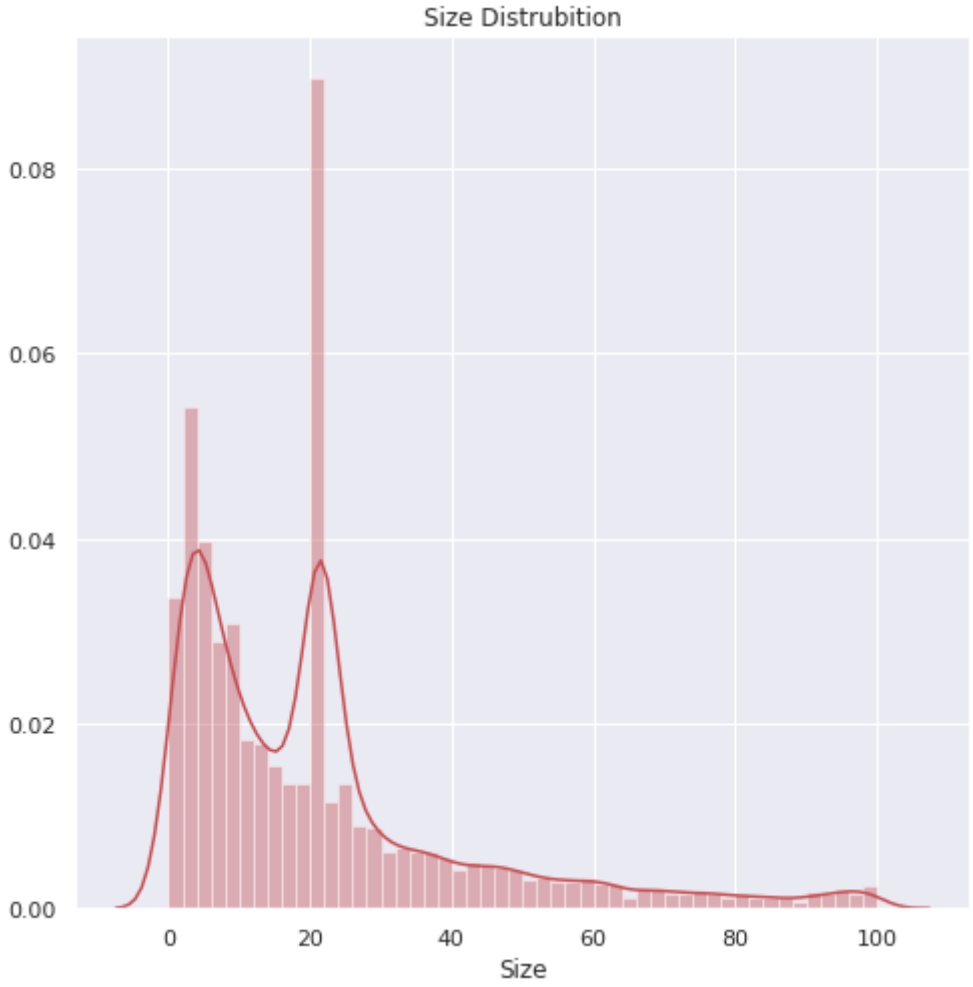
In [80]:
```
plt.figure(figsize=(8,8))
sns.distplot(df['Installs'],color='r');
plt.title("Size Distrubition")
plt.show()
```



In [81]:
```
plt.figure(figsize=(8,8))
sns.distplot(df['Reviews'],color='r');
plt.title("Reviews Distrubition")
plt.show()
```



In [84]:
```
plt.figure(figsize=(8,8))
sns.distplot(df['Size'],color='r');
plt.title("Size Distrubition")
plt.show()
```




Reducing Skewness by SQRT / LOG

In [85]:
```
skew(df["Size"])
```

Out[85]:
```
1.694954401251213
```

In [86]:
```
df["Size"] = np.sqrt(df["Size"])
```

In [87]:
```
skew(df["Size"])
```

Out[87]:
```
0.606580926422754
```

Handling Catagorical & Numeric Data

In [88]:
```
le = LabelEncoder()
```

In [89]:
```
df["Type"] = df["Type"].map({'Free':0,"Paid":1})
```

In [90]:
```
df["Type"].unique()
```

Out[90]:
```
array([0, 1])
```

In [91]:
```
df["Type"] = le.fit_transform(df["Type"])
```

In [92]:
```
df["Content Rating"] = le.fit_transform(df["Content Rating"])
```

In [93]:
```
df["Content Rating"] = df["Content Rating"].astype("int64")
```

In [94]:
```
df["Category"] = le.fit_transform(df["Category"])
```

In [95]:
```
df["Category"] = df["Category"].astype("int64")
```

In [96]:
```
df_cat = df.select_dtypes(object)
```

In [97]:
```
df_cat
```

Out[97]:

| | App |
|---|---|
| **0** | Photo Editor & Candy Camera & Grid & ScrapBook |
| **1** | Coloring book moana |
| **2** | U Launcher Lite – FREE Live Cool Themes, Hide ... |
| **3** | Sketch - Draw & Paint |
| **4** | Pixel Draw - Number Art Coloring Book |
| **...** | ... |
| **10836** | Sya9a Maroc - FR |
| **10837** | Fr. Mike Schmitz Audio Teachings |
| **10838** | Parkinson Exercices FR |
| **10839** | The SCP Foundation DB fr nn5n |
| **10840** | iHoroscope - 2018 Daily Horoscope & Astrology |

10836 rows × 1 columns

In [98]:
```
df_num = df.select_dtypes(["float64","int64"])
```

In [99]:
```
df_num
```

Out[99]:

| | Category | Rating | Reviews | Size | Installs | Type | Price | Content Rating |
|---|---|---|---|---|---|---|---|---|
| **0** | 0 | 4.100000 | 159 | 4.358899 | 10000 | 0 | 0.0 | 1 |
| **1** | 0 | 3.900000 | 967 | 3.741657 | 500000 | 0 | 0.0 | 1 |
| **2** | 0 | 4.700000 | 87510 | 2.949576 | 5000000 | 0 | 0.0 | 1 |
| **3** | 0 | 4.500000 | 215644 | 5.000000 | 50000000 | 0 | 0.0 | 4 |
| **4** | 0 | 4.300000 | 967 | 1.673320 | 100000 | 0 | 0.0 | 1 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... |
| **10836** | 11 | 4.500000 | 38 | 7.280110 | 5000 | 0 | 0.0 | 1 |
| **10837** | 11 | 5.000000 | 4 | 1.897367 | 100 | 0 | 0.0 | 1 |
| **10838** | 20 | 4.193338 | 3 | 3.082207 | 1000 | 0 | 0.0 | 1 |
| **10839** | 3 | 4.500000 | 114 | 4.638591 | 1000 | 0 | 0.0 | 3 |
| **10840** | 18 | 4.500000 | 398307 | 4.358899 | 10000000 | 0 | 0.0 | 1 |

10836 rows × 8 columns

In [100]:
```
df_new = pd.concat([df_cat,df_num],axis=1)
```

In [102]:
```
df_new.head()
```

Out[102]:

| | App | Category | Rating | Reviews | Size | Installs | Type | Price | Content Rating |
|---|---|---|---|---|---|---|---|---|---|
| **0** | Photo Editor & Candy Camera & Grid & ScrapBook | 0 | 4.1 | 159 | 4.358899 | 10000 | 0 | 0.0 | 1 |
| **1** | Coloring book moana | 0 | 3.9 | 967 | 3.741657 | 500000 | 0 | 0.0 | 1 |
| **2** | U Launcher Lite – FREE Live Cool Themes, Hide ... | 0 | 4.7 | 87510 | 2.949576 | 5000000 | 0 | 0.0 | 1 |
| **3** | Sketch - Draw & Paint | 0 | 4.5 | 215644 | 5.000000 | 50000000 | 0 | 0.0 | 4 |
| **4** | Pixel Draw - Number Art Coloring Book | 0 | 4.3 | 967 | 1.673320 | 100000 | 0 | 0.0 | 1 |

In [ ]: