In [1]:

```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
```

First let's see how the data in general is laid out and what the data looks like

In [2]:

```
df = pd.read_csv("main_apple.csv")
df.head()
```

Out[2]:

	name	size	price	rating_count_tot	rating	content_rating	category
0	PAC-MAN Premium	100788224	3.99	21292	4.0	4+	Games
1	Evernote - stay organized	158578688	0.00	161065	4.0	4+	Productivity
2	WeatherBug - Local Weather, Radar, Maps, Alerts	100524032	0.00	188583	3.5	4+	Weather
3	eBay: Best App to Buy, Sell, Save! Online Shop...	128512000	0.00	262241	4.0	12+	Shopping
4	Bible	92774400	0.00	985920	4.5	4+	Reference

In [3]:

```
df.describe()
```

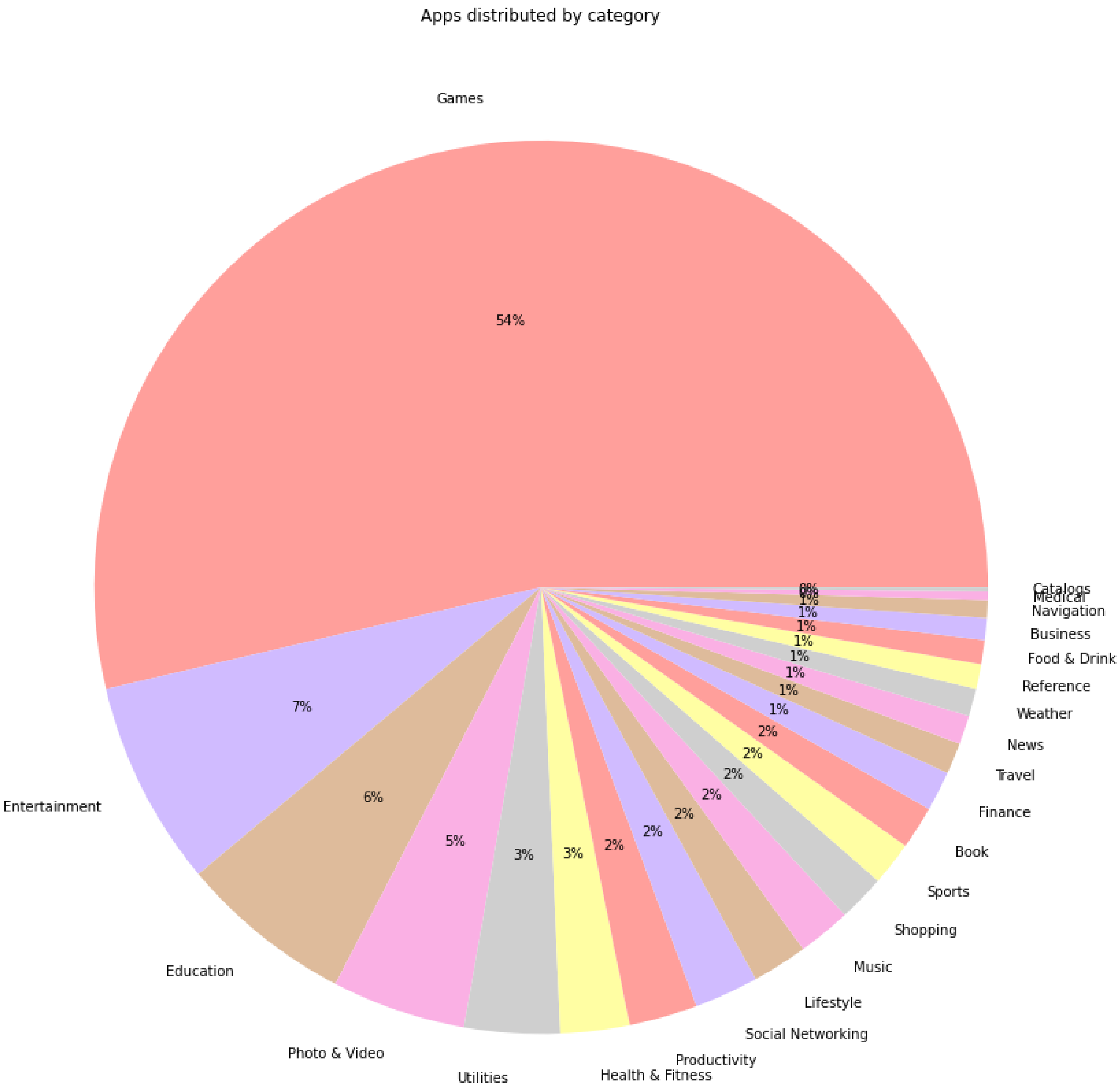
Out[3]:

	size	price	rating_count_tot	rating
count	7.197000e+03	7197.000000	7.197000e+03	7197.000000
mean	1.991345e+08	1.726218	1.289291e+04	3.526956
std	3.592069e+08	5.833006	7.573941e+04	1.517948
min	5.898240e+05	0.000000	0.000000e+00	0.000000
25%	4.692275e+07	0.000000	2.800000e+01	3.500000
50%	9.715302e+07	0.000000	3.000000e+02	4.000000
75%	1.819249e+08	1.990000	2.793000e+03	4.500000
max	4.025970e+09	299.990000	2.974676e+06	5.000000

Now, let's see how the apps are distributed with category and price

```
In [4]: free_categ = df[df['price'] == 0]['category']
        paid_categ = df[df['price']>0]['category']
        categ = df['category']

        paid_categ = paid_categ.value_counts().to_dict()
        free_categ = free_categ.value_counts().to_dict()
        categ = categ.value_counts().to_dict()
```

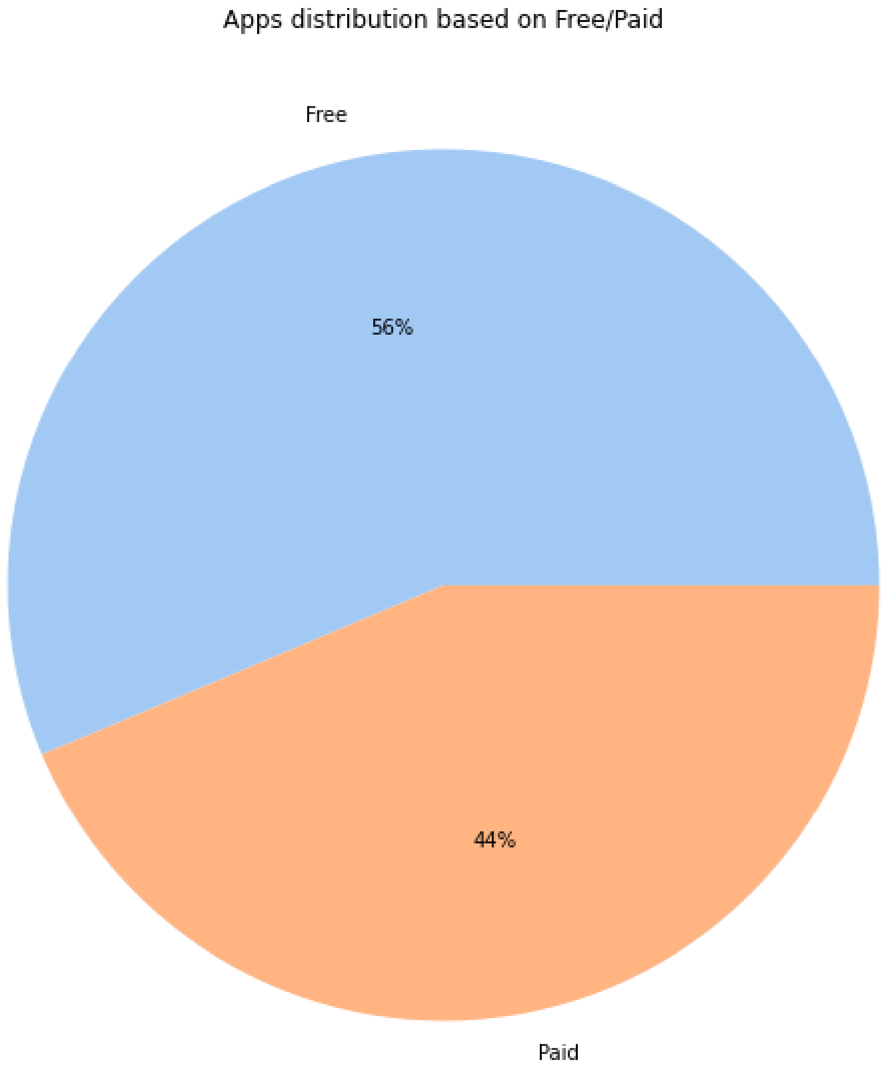
```
In [5]: colors = sns.color_palette('pastel')[3:9]
        plt.rcParams["figure.figsize"] = (15,15)
        plt.pie(list(categ.values()), labels = list(categ.keys()), colors = colo
        rs, autopct='%.0f%%')
        plt.title("Apps distributed by category")
        plt.show()
```



Now, let's see how the apps are distributed with price

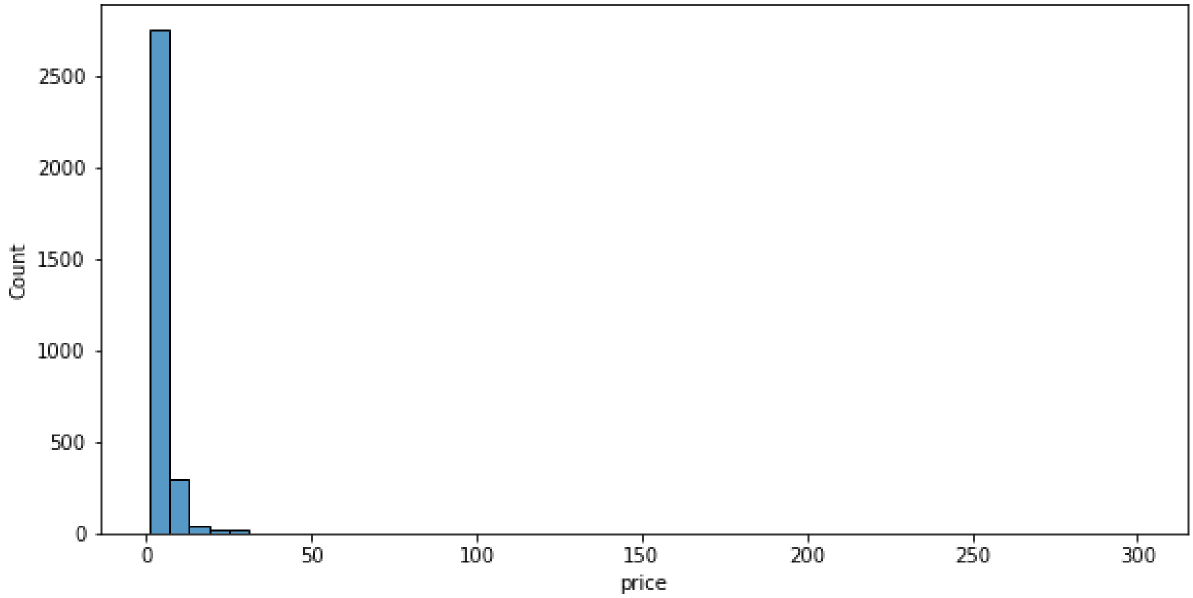
In [6]:

```
price_of_apps = [df[df['price'] == 0].shape[0]]
price_of_apps.append(df.shape[0] - price_of_apps[0])

labels = ['Free', 'Paid']

colors = sns.color_palette('pastel')[0:5]
plt.rcParams["figure.figsize"] = (10,10)
plt.pie(price_of_apps, labels = labels, colors = colors, autopct='%.0f%%')
plt.title("Apps distribution based on Free/Paid")
plt.show()
```



Okay we can see that about 44% of the applications on the app store are paid and the rest are free

```
In [7]: price_categ = df[df['price'] > 0][['price','category']]
        plt.rcParams["figure.figsize"] = (10,5)
        sns.histplot(price_categ['price'], bins =50)
        plt.show()
```

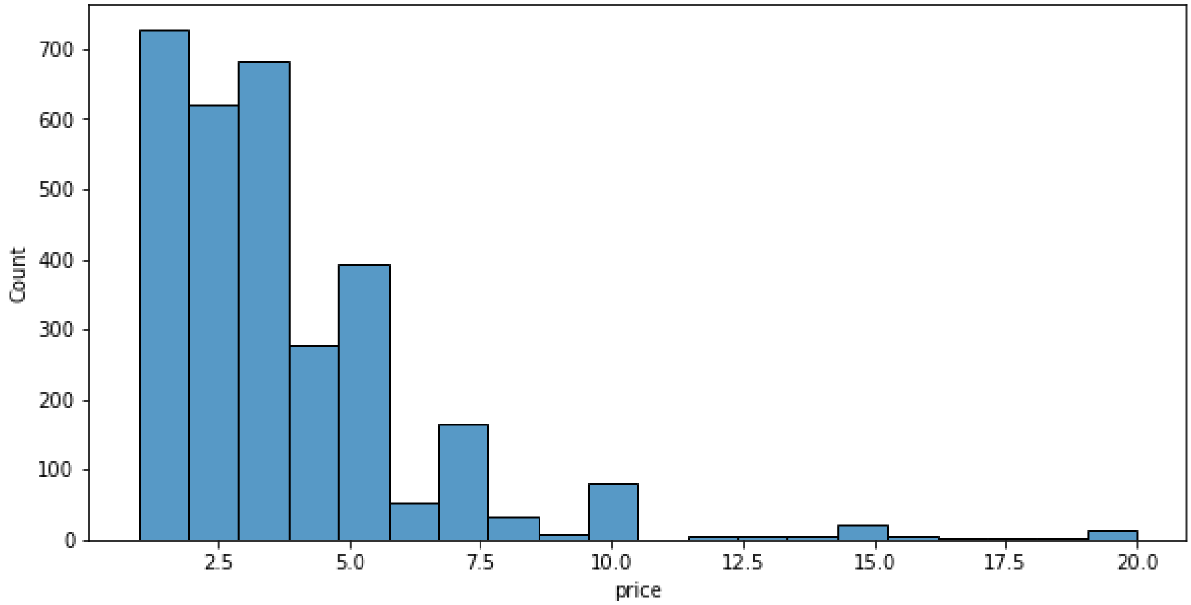


Except some outliers, most of the data is concentrated from 0 to 20

Let's explore 0-20 range to get a better idea

```
In [8]: price_below_20 = df[(df['price'] > 0) & (df['price'] <20)]['price']
        sns.histplot(price_below_20, bins =20)
```

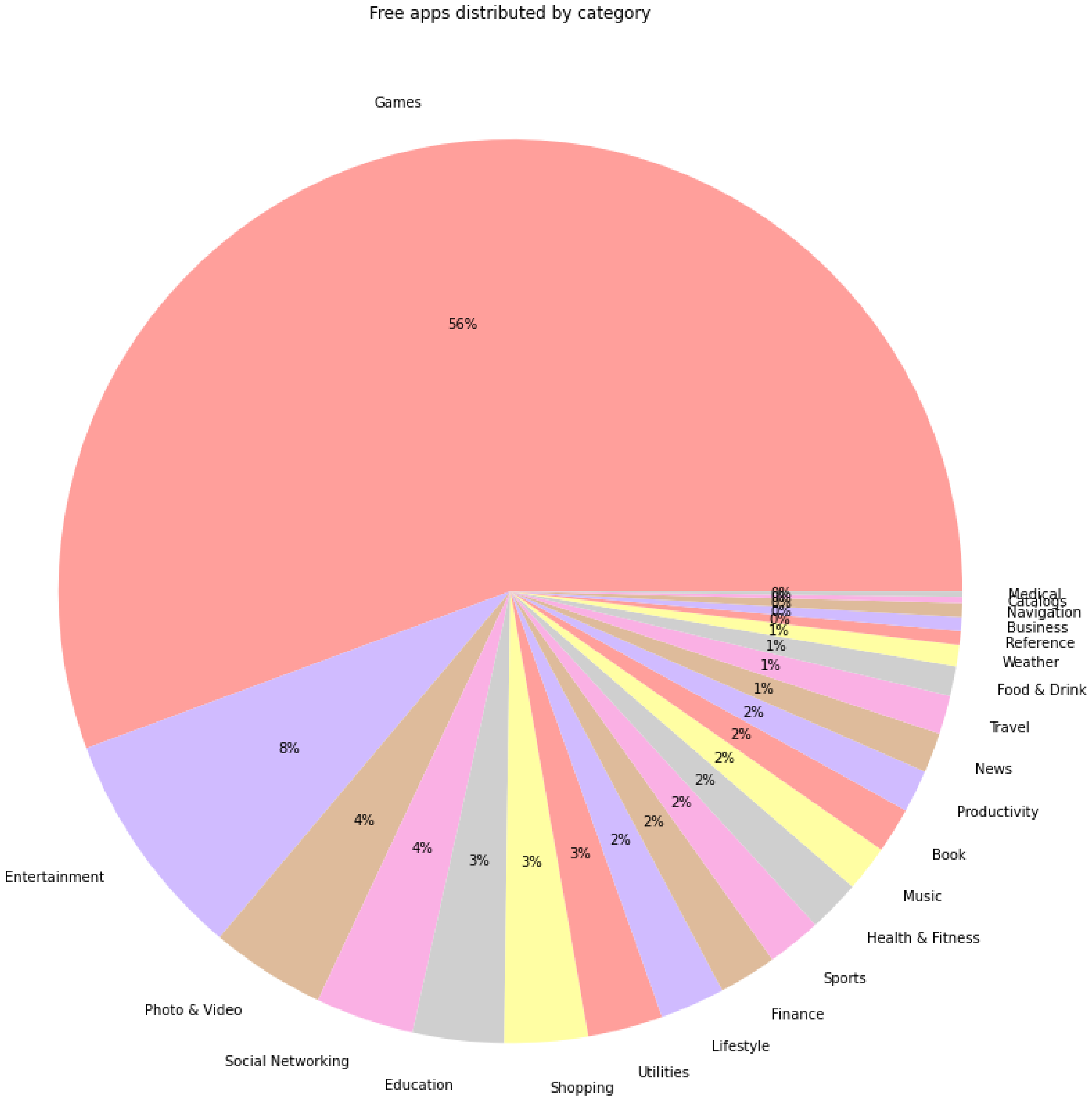
```
Out[8]: <matplotlib.axes._subplots.AxesSubplot at 0x7fa575824130>
```



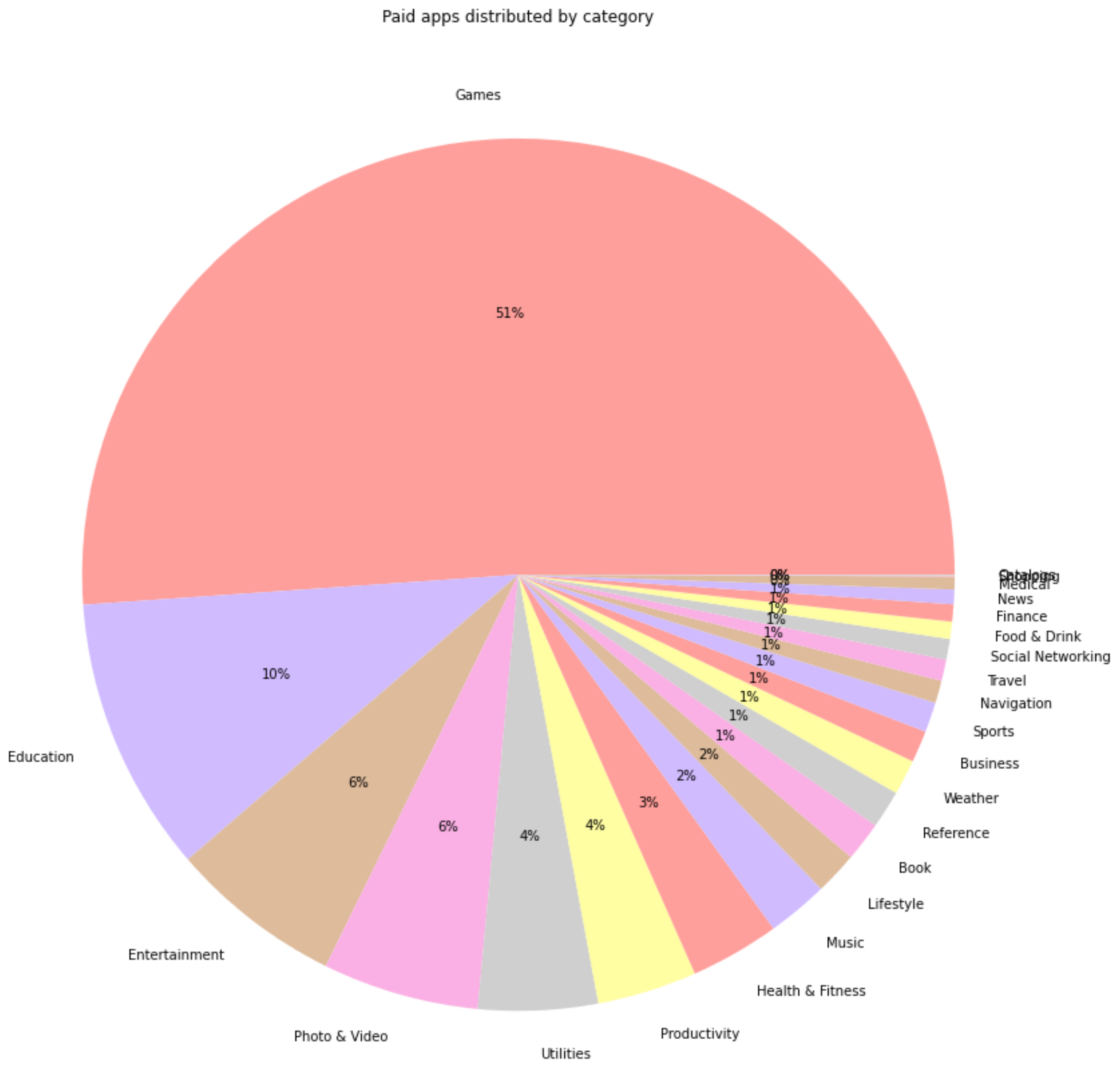
We can see most of apps are concentrated between 0 and 10

Now, let's see how the apps are distributed with price and category

In [9]:
```
colors = sns.color_palette('pastel')[3:9]
plt.rcParams["figure.figsize"] = (15,15)
plt.pie(list(free_categ.values()), labels = list(free_categ.keys()), col
ors = colors, autopct='%.0f%%')
plt.title("Free apps distributed by category")
plt.show()
```



```
In [10]: colors = sns.color_palette('pastel')[3:9]
         plt.rcParams["figure.figsize"] = (15,15)
         plt.pie(list(paid_categ.values()), labels = list(paid_categ.keys()), col
         ors = colors, autopct='%.0f%%')
         plt.title("Paid apps distributed by category")
         plt.show()
```



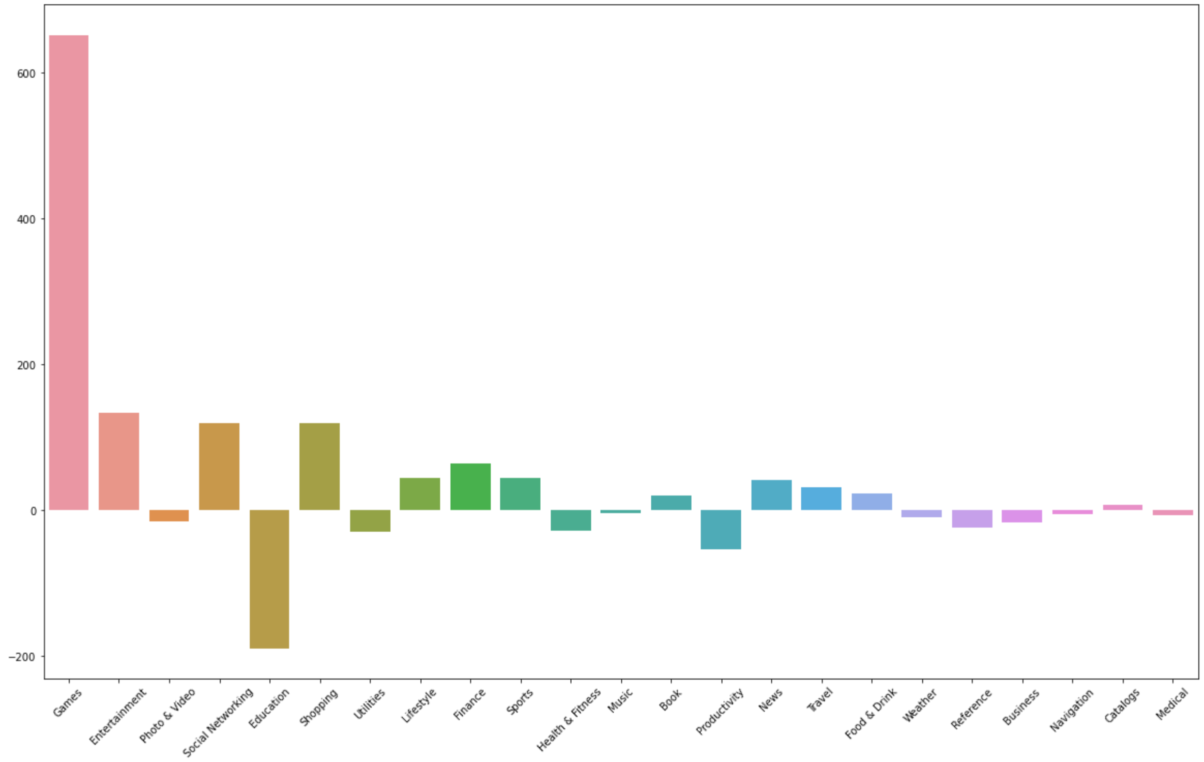
Now, let's see what type of categories are more paid than free or more free than paid

In [11]:

```
difference = {}
for x in free_categ:
    difference[x] = int(free_categ[x] - paid_categ[x])

plt.rcParams["figure.figsize"] = (20, 12)
plt.xticks(rotation = 45)
sns.barplot(x=list(difference.keys()),y =list(difference.values()))
```

Out[11]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x7fa57600b040>
```

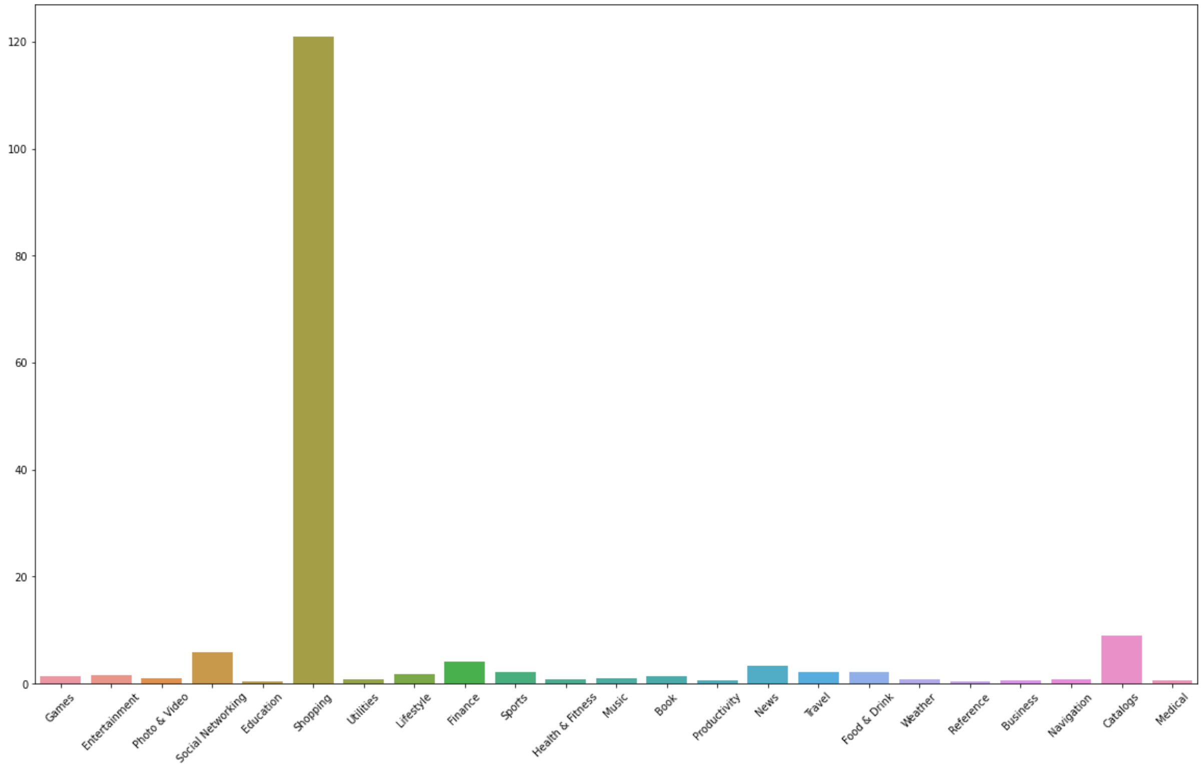


From the above plot we can see that Education, Health and Productivity apps are the ones with more paid apps than free apps. On the other hand we can also see that Games, Photo and Shopping apps are more freely avaiable

Let's also explore the ratio of free to paid apps so that we do not get ahead of ourselves. Difference itself will not be able to accurately paint a good picture.

```
In [12]: differenceTwo = {}
         for x in free_categ:
             differenceTwo[x] = float(free_categ[x] / paid_categ[x])

         plt.rcParams["figure.figsize"] = (20, 12)
         plt.xticks(rotation = 45)
         sns.barplot(x=list(differenceTwo.keys()),y =list(differenceTwo.values
         ()))
```

```
Out[12]: <matplotlib.axes._subplots.AxesSubplot at 0x7fa5765bac10>
```

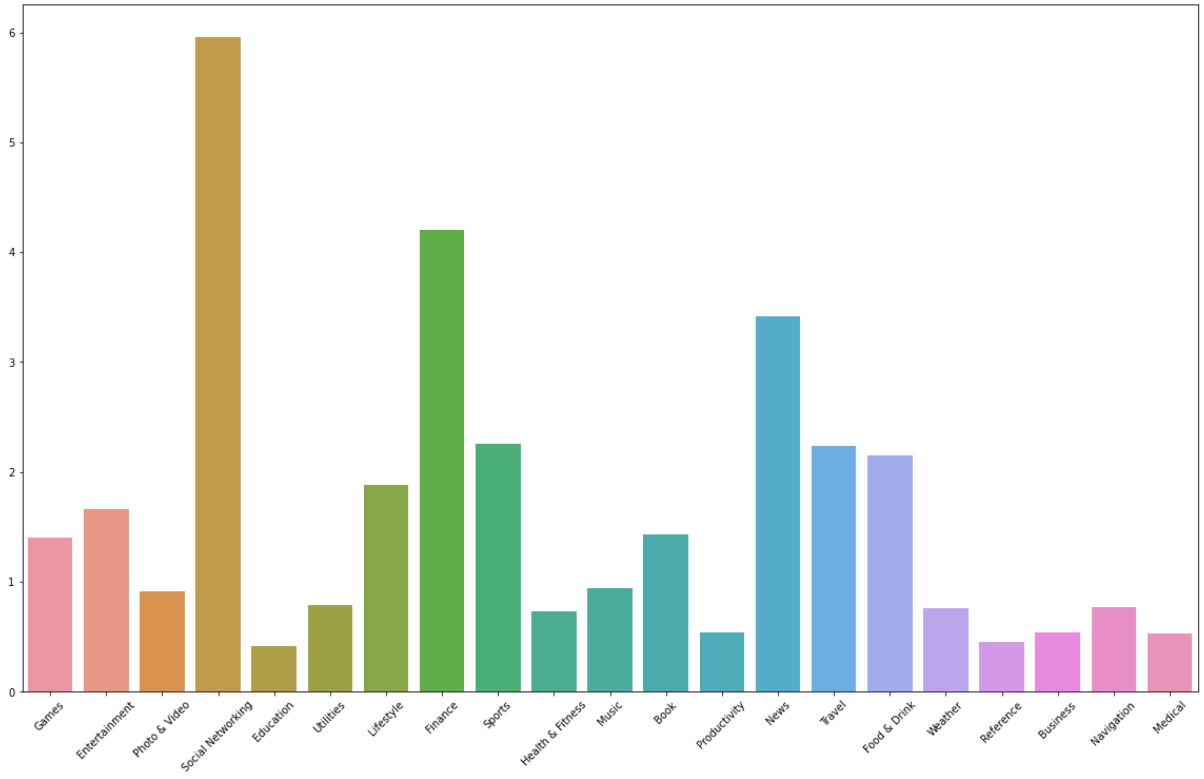


We can see that shopping and catalogs apps are more freely avaialable in the market place. Mostly because the users who spend time there will pay in the.

Let's plot the same graph without Shopping and Catalogs to see the ratio more in depth

```
In [13]: new_set = differenceTwo.copy()
         new_set.pop("Shopping")
         new_set.pop("Catalogs")

         plt.rcParams["figure.figsize"] = (20, 12)
         plt.xticks(rotation = 45)
         sns.barplot(x=list(new_set.keys()),y =list(new_set.values()))
```

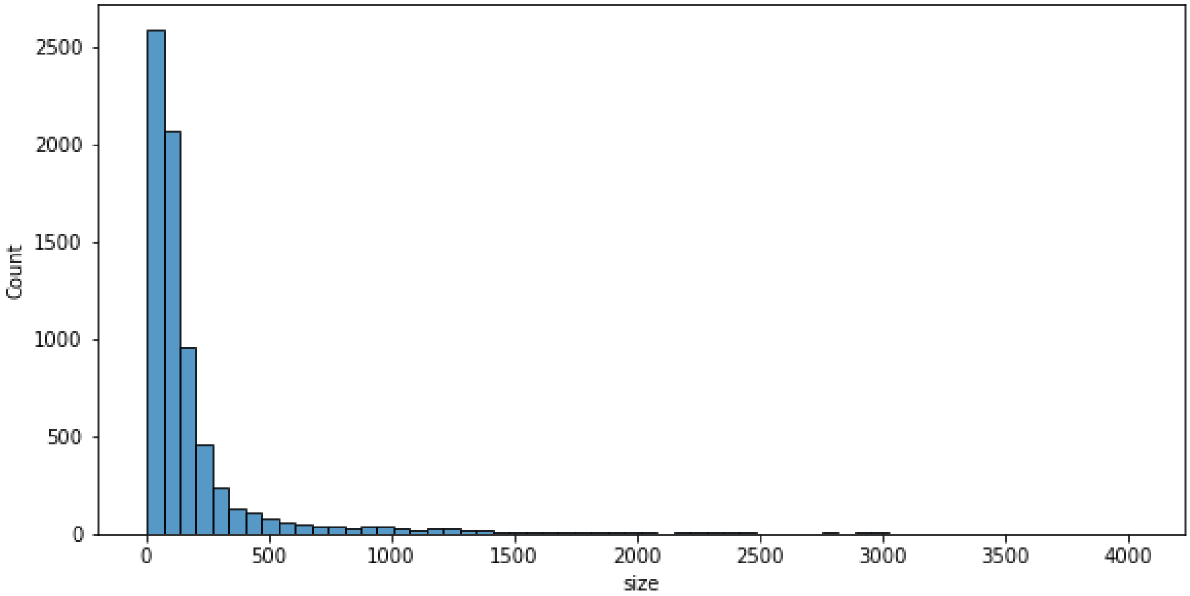
```
Out[13]: <matplotlib.axes._subplots.AxesSubplot at 0x7fa576044610>
```



Let's see how the memory size of the application is distributed

In [14]:

```
size_data = df['size'].apply(lambda x:float(x/1000000))
plt.rcParams["figure.figsize"] = (10,5)
sns.histplot(size_data, bins =60)
plt.show()
```



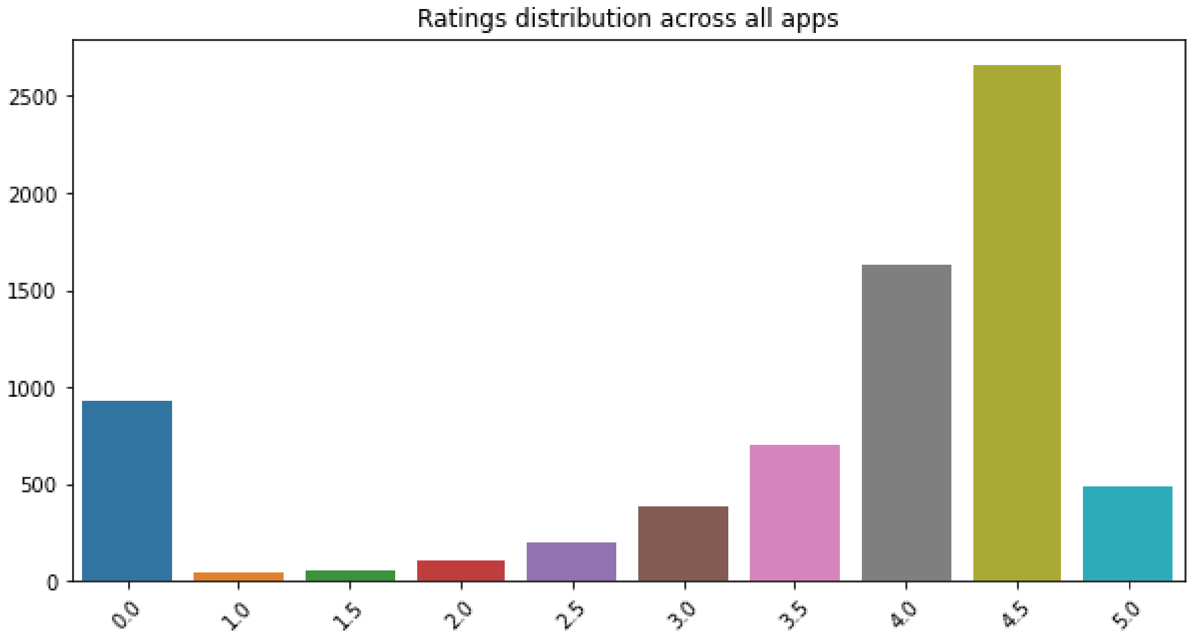
We can see that most of the application are concentrated below 500MB

Now let's see how the rating and the content rating are distributed

First let's look at them individually and later we can look at them jointly

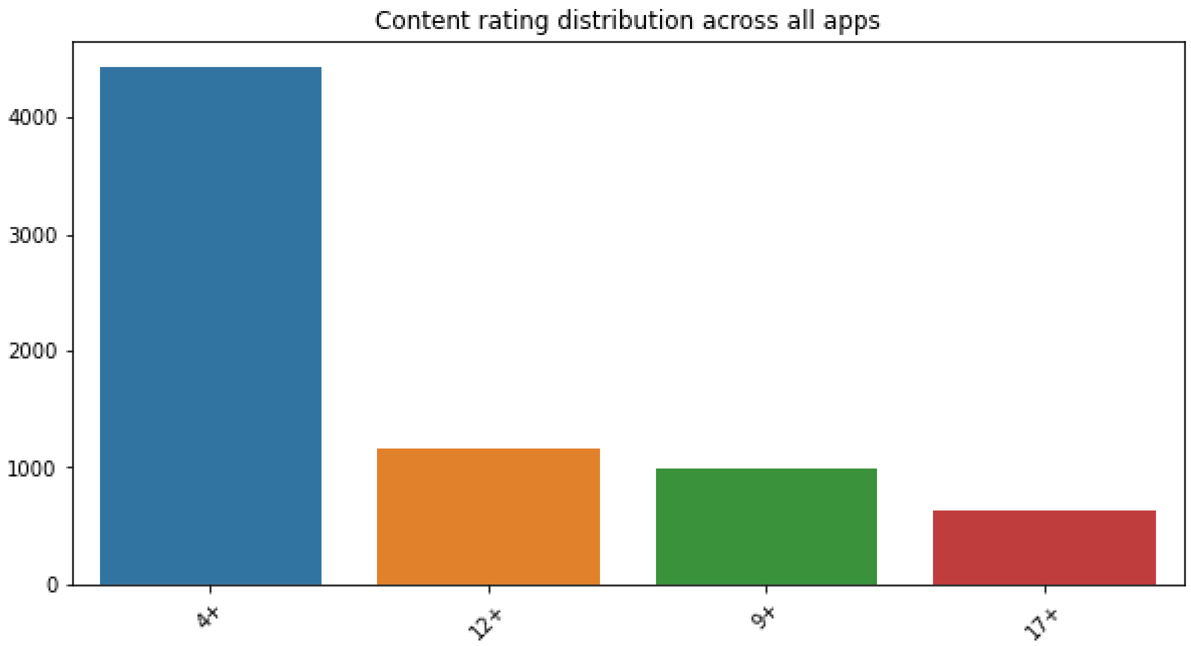
```
In [15]: rating = df[['rating','content_rating']]

         user_rating = rating['rating'].value_counts().to_dict()
         content_rating = rating['content_rating'].value_counts().to_dict()

         plt.rcParams["figure.figsize"] = (10, 5)
         plt.xticks(rotation = 45)
         plt.title("Ratings distribution across all apps")
         sns.barplot(x=list(user_rating.keys()),y =list(user_rating.values()))
```

```
Out[15]: <matplotlib.axes._subplots.AxesSubplot at 0x7fa575fd58e0>
```



```
In [16]: plt.rcParams["figure.figsize"] = (10, 5)
         plt.xticks(rotation = 45)
         plt.title("Content rating distribution across all apps")
         sns.barplot(x=list(content_rating.keys()),y =list(content_rating.values
         ()))
```

```
Out[16]: <matplotlib.axes._subplots.AxesSubplot at 0x7fa5734a6910>
```

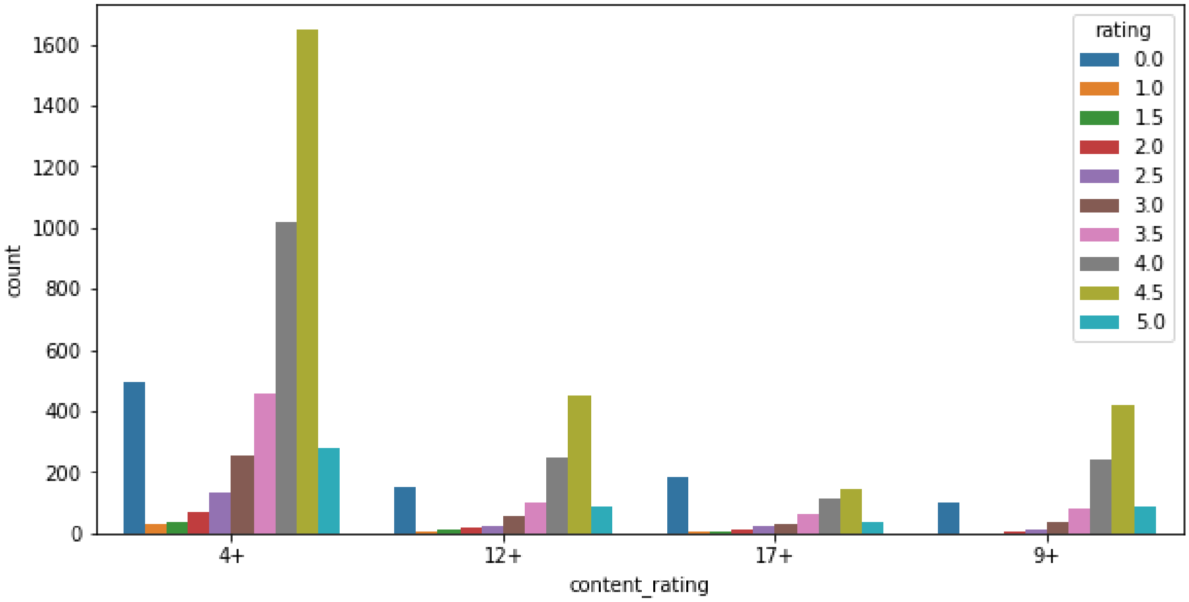


From th above two plots we can figure out that most of the applications are for everyone and the ratings grew monotonically till 4.5

Now let's try to infer or extrapolate anything by poltting their joint distribution

```
In [17]: sns.countplot(x = "content_rating", hue = "rating", data = rating)
```

```
Out[17]: <matplotlib.axes._subplots.AxesSubplot at 0x7fa571f14640>
```



We can see that amongst all age groups the ratings are almost evenly distributed, but the scale is different