

```
In [51]: import pandas as pd
import numpy as np
import matplotlib as plt
import matplotlib.pyplot as plt

df = pd.read_csv("/ESPN_take_home/app_info.csv")
df1= pd.read_csv("/ESPN_take_home/app_reviews.csv")

df.head()
df1.head()
#print("from df",df)
#print("from df1",df1)
```

Out[51]:

	App	Translated_Review	Sentiment	Sentiment_Polarity	Sentiment_Subjectivity
0	10 Best Foods for You	I like eat delicious food. That's I'm cooking ...	Positive	1.00	0.533333
1	10 Best Foods for You	This help eating healthy exercise regular basis	Positive	0.25	0.288462
2	10 Best Foods for You	NaN	NaN	NaN	NaN
3	10 Best Foods for You	Works great especially going grocery store	Positive	0.40	0.875000
4	10 Best Foods for You	Best idea us	Positive	1.00	0.300000

```
In [14]: df.head()
```

Out[14]:

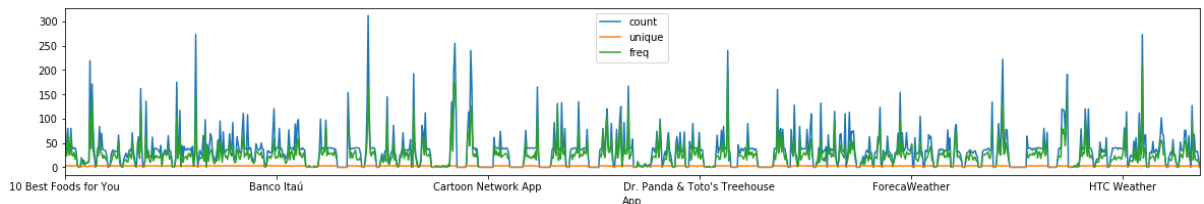
	App	Category	Rating	Reviews	Size	Installs	Type	Price	Content Rating	
0	Photo Editor & Candy Camera & Grid & ScrapBook	ART_AND_DESIGN	4.1	159	19M	10,000+	Free	0	Everyone	
1	Coloring book moana	ART_AND_DESIGN	3.9	967	14M	500,000+	Free	0	Everyone	De
2	U Launcher Lite – FREE Live Cool Themes, Hide ...	ART_AND_DESIGN	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	Des

```
In [68]: group_by_appl = df1.groupby(['App'])['Sentiment']
plot_df = group_by_appl.describe()
print(plot_df)
plot_df.plot()
```

	count	unique	top f
req			
App			
10 Best Foods for You	194	3	Positive
162			
104 找工作 - 找工作 找打工 找兼職 履歷健檢 履歷診療室			40
3 Positive 31			
11st	40	3	Positive
23			
1800 Contacts - Lens Store	80	3	Positive
64			
1LINE - One Line with One Touch	38	3	Positive
27			
...
...			
Hotspot Shield Free VPN Proxy & Wi-Fi Security	34	3	Positive
17			
Hotstar	32	3	Negative
14			
Hotwire Hotel & Car Rental App	33	3	Positive
16			
Housing-Real Estate & Property	21	3	Negative
10			
Houzz Interior Design Ideas	0	0	NaN
NaN			

[1074 rows x 4 columns]

Out[68]: <matplotlib.axes._subplots.AxesSubplot at 0x1a247dbd10>



```
In [33]: df[df['Rating'] == 1].sort_values('App')['Installs'].head(10)
```

```
Out[33]: 6319      1,000+
7144      500+
7427      100+
7806      100+
5151       50+
8820      500+
8875       50+
10324     1,000+
10400     100+
625       10+
Name: Installs, dtype: object
```

```
In [49]: df['Rating'] = df.groupby('App')['Installs'].transform('size')  
print(df.set_index(['App', 'Installs']))
```

Category \	App	Installs	
	Photo Editor & Candy Camera & Grid & ScrapBook	10,000+	AR
	T_AND_DESIGN		
	Coloring book moana	500,000+	AR
	T_AND_DESIGN		
	U Launcher Lite – FREE Live Cool Themes, Hide Apps	5,000,000+	AR
	T_AND_DESIGN		
	Sketch – Draw & Paint	50,000,000+	AR
	T_AND_DESIGN		
	Pixel Draw – Number Art Coloring Book	100,000+	AR
	T_AND_DESIGN		
	...		
	...		
	Sya9a Maroc – FR	5,000+	
	FAMILY		
	Fr. Mike Schmitz Audio Teachings	100+	
	FAMILY		
	Parkinson Exercices FR	1,000+	
	MEDICAL		
	The SCP Foundation DB fr nn5n	1,000+	BOOKS_A
	ND_REFERENCE		
	iHoroscope – 2018 Daily Horoscope & Astrology	10,000,000+	
	LIFESTYLE		

		Rating
\		
App	Installs	
Photo Editor & Candy Camera & Grid & ScrapBook	10,000+	1
Coloring book moana	500,000+	2
U Launcher Lite – FREE Live Cool Themes, Hide Apps	5,000,000+	1
Sketch – Draw & Paint	50,000,000+	1
Pixel Draw – Number Art Coloring Book	100,000+	1
...		...
Sya9a Maroc – FR	5,000+	1
Fr. Mike Schmitz Audio Teachings	100+	1
Parkinson Exercices FR	1,000+	1
The SCP Foundation DB fr nn5n	1,000+	1
iHoroscope – 2018 Daily Horoscope & Astrology	10,000,000+	1

		Reviews
\		
App	Installs	
Photo Editor & Candy Camera & Grid & ScrapBook	10,000+	159
Coloring book moana	500,000+	967
U Launcher Lite – FREE Live Cool Themes, Hide Apps	5,000,000+	87510
Sketch – Draw & Paint	50,000,000+	215644
Pixel Draw – Number Art Coloring Book	100,000+	967
...		...
Sya9a Maroc – FR	5,000+	38
Fr. Mike Schmitz Audio Teachings	100+	4
Parkinson Exercices FR	1,000+	3
The SCP Foundation DB fr nn5n	1,000+	114
iHoroscope – 2018 Daily Horoscope & Astrology	10,000,000+	398307

Size \			
App	Installs		
Photo Editor & Candy Camera & Grid & ScrapBook	10,000+		
19M			
Coloring book moana	500,000+		
14M			
U Launcher Lite – FREE Live Cool Themes, Hide Apps	5,000,000+		
8.7M			
Sketch – Draw & Paint	50,000,000+		
25M			
Pixel Draw – Number Art Coloring Book	100,000+		
2.8M			
...			
...			
Sya9a Maroc – FR	5,000+		
53M			
Fr. Mike Schmitz Audio Teachings	100+		
3.6M			
Parkinson Exercices FR	1,000+		
9.5M			
The SCP Foundation DB fr nn5n	1,000+	Varies	
with device			
iHoroscope – 2018 Daily Horoscope & Astrology	10,000,000+		
19M			
		Type	Pr
ice \			
App	Installs		
Photo Editor & Candy Camera & Grid & ScrapBook	10,000+	Free	
0			
Coloring book moana	500,000+	Free	
0			
U Launcher Lite – FREE Live Cool Themes, Hide Apps	5,000,000+	Free	
0			
Sketch – Draw & Paint	50,000,000+	Free	
0			
Pixel Draw – Number Art Coloring Book	100,000+	Free	
0			
...		...	
...			
Sya9a Maroc – FR	5,000+	Free	
0			
Fr. Mike Schmitz Audio Teachings	100+	Free	
0			
Parkinson Exercices FR	1,000+	Free	
0			
The SCP Foundation DB fr nn5n	1,000+	Free	
0			
iHoroscope – 2018 Daily Horoscope & Astrology	10,000,000+	Free	
0			
		Content	
Rating \			
App	Installs		
Photo Editor & Candy Camera & Grid & ScrapBook	10,000+		Ev
everyone			
Coloring book moana	500,000+		Ev

everyone		
U Launcher Lite – FREE Live Cool Themes, Hide Apps	5,000,000+	Ev
everyone		
Sketch – Draw & Paint	50,000,000+	
Teen		
Pixel Draw – Number Art Coloring Book	100,000+	Ev
everyone		
...		
...		
Sya9a Maroc – FR	5,000+	Ev
everyone		
Fr. Mike Schmitz Audio Teachings	100+	Ev
everyone		
Parkinson Exercices FR	1,000+	Ev
everyone		
The SCP Foundation DB fr nn5n	1,000+	Matu
re 17+		
iHoroscope – 2018 Daily Horoscope & Astrology	10,000,000+	Ev
everyone		

Genres \		
App	Installs	
Photo Editor & Candy Camera & Grid & ScrapBook	10,000+	
Art & Design		
Coloring book moana	500,000+	Art & D
esign;Pretend Play		
U Launcher Lite – FREE Live Cool Themes, Hide Apps	5,000,000+	
Art & Design		
Sketch – Draw & Paint	50,000,000+	
Art & Design		
Pixel Draw – Number Art Coloring Book	100,000+	Art &
Design;Creativity		
...		
...		
Sya9a Maroc – FR	5,000+	
Education		
Fr. Mike Schmitz Audio Teachings	100+	
Education		
Parkinson Exercices FR	1,000+	
Medical		
The SCP Foundation DB fr nn5n	1,000+	
Books & Reference		
iHoroscope – 2018 Daily Horoscope & Astrology	10,000,000+	
Lifestyle		

Las

t Updated \		
App	Installs	
Photo Editor & Candy Camera & Grid & ScrapBook	10,000+	Januar
y 7, 2018		
Coloring book moana	500,000+	January
15, 2018		
U Launcher Lite – FREE Live Cool Themes, Hide Apps	5,000,000+	Augus
t 1, 2018		
Sketch – Draw & Paint	50,000,000+	Jun
e 8, 2018		

Pixel Draw - Number Art Coloring Book 20, 2018	100,000+	June
...		
...		
Sya9a Maroc - FR 25, 2017	5,000+	July
Fr. Mike Schmitz Audio Teachings y 6, 2018	100+	Jul
Parkinson Exercices FR 20, 2017	1,000+	January
The SCP Foundation DB fr nn5n 19, 2015	1,000+	January
iHoroscope - 2018 Daily Horoscope & Astrology 25, 2018	10,000,000+	July

Current Ver \

App	Installs	
Photo Editor & Candy Camera & Grid & ScrapBook 1.0.0	10,000+	
Coloring book moana 2.0.0	500,000+	
U Launcher Lite - FREE Live Cool Themes, Hide Apps 1.2.4	5,000,000+	
Sketch - Draw & Paint with device	50,000,000+	Varies
Pixel Draw - Number Art Coloring Book 1.1	100,000+	
...		
...		
Sya9a Maroc - FR 1.48	5,000+	
Fr. Mike Schmitz Audio Teachings 1.0	100+	
Parkinson Exercices FR 1.0	1,000+	
The SCP Foundation DB fr nn5n with device	1,000+	Varies
iHoroscope - 2018 Daily Horoscope & Astrology with device	10,000,000+	Varies

Android Ver

App	Installs	
Photo Editor & Candy Camera & Grid & ScrapBook 4.0.3 and up	10,000+	
Coloring book moana 4.0.3 and up	500,000+	
U Launcher Lite - FREE Live Cool Themes, Hide Apps 4.0.3 and up	5,000,000+	
Sketch - Draw & Paint 4.2 and up	50,000,000+	
Pixel Draw - Number Art Coloring Book 4.4 and up	100,000+	
...		
...		
Sya9a Maroc - FR	5,000+	

4.1 and up		
Fr. Mike Schmitz Audio Teachings	100+	
4.1 and up		
Parkinson Exercices FR	1,000+	
2.2 and up		
The SCP Foundation DB fr nn5n	1,000+	Varies
with device		
iHoroscope - 2018 Daily Horoscope & Astrology	10,000,000+	Varies
with device		

[10841 rows x 11 columns]

```
In [54]: df1['Translated_Review'] = df1.groupby('App')['Sentiment'].transform('size')
print(df1.set_index(['App', 'Sentiment']))
```