```python
In [1]: import numpy as np
        import pandas as pd
        import matplotlib.pyplot as plt
        import seaborn as sns
        import plotly.express as px
        from sklearn.model_selection import train_test_split
        from sklearn.ensemble import RandomForestRegressor
        from sklearn.metrics import mean_squared_error, r2_score
        import nltk
        import webbrowser
        import os
```

```python
In [2]: apps_df = pd.read_csv('Play Store Data.csv')
        reviews_df = pd.read_csv('User Reviews.csv')
        apps_df.head(), reviews_df.head()
```

```
Out[2]: (                                          App        Category  Rating  \
         0     Photo Editor & Candy Camera & Grid & ScrapBook  ART_AND_DESIGN     4.1
         1                                Coloring book moana  ART_AND_DESIGN     3.9
         2  U Launcher Lite – FREE Live Cool Themes, Hide ...  ART_AND_DESIGN     4.7
         3                            Sketch – Draw & Paint  ART_AND_DESIGN     4.5
         4            Pixel Draw – Number Art Coloring Book  ART_AND_DESIGN     4.3

            Reviews  Size     Installs  Type Price Content Rating  \
         0      159   19M      10,000+  Free     0       Everyone
         1      967   14M     500,000+  Free     0       Everyone
         2    87510  8.7M   5,000,000+  Free     0       Everyone
         3   215644   25M  50,000,000+  Free     0           Teen
         4      967  2.8M     100,000+  Free     0       Everyone

                            Genres     Last Updated         Current Ver  \
         0               Art & Design   January 7, 2018             1.0.0
         1  Art & Design;Pretend Play  January 15, 2018             2.0.0
         2               Art & Design    August 1, 2018             1.2.4
         3               Art & Design      June 8, 2018  Varies with device
         4    Art & Design;Creativity     June 20, 2018               1.1

             Android Ver
         0  4.0.3 and up
         1  4.0.3 and up
         2  4.0.3 and up
         3    4.2 and up
         4    4.4 and up  ,
                        App                          Translated_Review  \
         0  10 Best Foods for You  I like eat delicious food. That's I'm cooking ...
         1  10 Best Foods for You    This help eating healthy exercise regular basis
         2  10 Best Foods for You                                           NaN
         3  10 Best Foods for You        Works great especially going grocery store
         4  10 Best Foods for You                                   Best idea us

           Sentiment  Sentiment_Polarity  Sentiment_Subjectivity
         0  Positive                1.00                0.533333
         1  Positive                0.25                0.288462
         2       NaN                 NaN                     NaN
         3  Positive                0.40                0.875000
         4  Positive                1.00                0.300000  )
```

```python
In [3]: apps_df = apps_df.dropna(subset=['Rating'])
        for column in apps_df.columns:
            apps_df[column].fillna(apps_df[column].mode()[0], inplace=True)
        apps_df.drop_duplicates(inplace=True)
        apps_df = apps_df[apps_df['Rating'] <= 5]
        reviews_df.dropna(subset=['Translated_Review'], inplace=True)
```

```python
In [4]: apps_df['Reviews'] = pd.to_numeric(apps_df['Reviews'], errors='coerce')
        filtered_apps = apps_df[apps_df['Reviews']>1000]
```

```python
In [5]: top_categories = filtered_apps['Category'].value_counts().head(5).index
        filtered_apps = filtered_apps[filtered_apps['Category'].isin(top_categories)]
```

```python
In [6]: merged_df = pd.merge(filtered_apps, reviews_df, on='App', how='inner')
        merged_df = merged_df.dropna(subset=['Sentiment'])
        merged_df.head()
```

```
Out[6]:
           App        Category  Rating  Reviews  Size  Installs  Type  Price  Content Rating  Genres  Last Updated  Current Ver  Android Ver  Translated_Review                          Sentiment  Sentiment_Polarity  Sentiment_Subjectivity
 0  Candy Crush Saga  GAME     4.4   22426677  74M  500,000,000+  Free  0  Everyone  Casual  July 5, 2018  1.129.0.2  4.1 and up  If get free lives refill, continue accumulate ...  Positive  0.374411  0.556987
 1  Candy Crush Saga  GAME     4.4   22426677  74M  500,000,000+  Free  0  Everyone  Casual  July 5, 2018  1.129.0.2  4.1 and up  My original rating 01/2015 5 Stars still holdi...  Positive  0.250000  0.475000
 2  Candy Crush Saga  GAME     4.4   22426677  74M  500,000,000+  Free  0  Everyone  Casual  July 5, 2018  1.129.0.2  4.1 and up  This good time passing game. However, I like l...  Positive  0.200926  0.437963
 3  Candy Crush Saga  GAME     4.4   22426677  74M  500,000,000+  Free  0  Everyone  Casual  July 5, 2018  1.129.0.2  4.1 and up  Fun first, spending two weeks level makes want...  Positive  0.183333  0.296825
 4  Candy Crush Saga  GAME     4.4   22426677  74M  500,000,000+  Free  0  Everyone  Casual  July 5, 2018  1.129.0.2  4.1 and up  Please get rid amount pop ups love things holy...  Positive  0.319444  0.600000
```

```python
In [7]: def categorize_rating(rating):
            if rating >= 4:
                return '4-5 stars'
            elif rating >= 3:
                return '3-4 stars'
            else:
                return '1-2 stars'
```

```python
In [8]: merged_df['Rating Group']= merged_df['Rating'].apply(categorize_rating)
```

```python
In [9]: sentiment_counts = merged_df.groupby(['Rating Group','Sentiment']).size().unstack().fillna(0)
        sentiment_counts
```

```
Out[9]:
Sentiment     Negative  Neutral  Positive

Rating Group

3-4 stars         169      125       351

4-5 stars        9034     1949     17356
```

```python
In [10]: sentiment_plot_df = sentiment_counts.reset_index().melt(id_vars=["Rating Group"], var_name="Sentiment", value_name="Count")
```

```python
In [11]: fig = px.bar(
             sentiment_plot_df,
             x="Rating Group",
             y="Count",
             color="Sentiment",
             title="Sentiment Distribution by Rating Group",
             color_discrete_map={"Positive": "green", "Neutral": "gray", "Negative": "red"},
             text_auto=True,
             barmode="stack"
         )
```

```python
In [12]: chart_path = "sentiment_distribution.html"
         fig.write_html(chart_path)
```

```python
In [13]: display_html = '''
         <!DOCTYPE html>
         <html lang="en">
         <head>
             <meta charset="UTF-8">
             <meta name="viewport" content="width=device-width, initial-scale=1.0">
             <title>Sentiment Distribution Chart</title>
             <script>
                 function openChart() {
                     window.open("sentiment_distribution.html", "_blank");
                 }
             </script>
         </head>
         <body>
             <h2>Sentiment Distribution Chart</h2>
             <button onclick="openChart()">Open Chart</button>
         </body>
         </html>
         '''
```

```python
In [14]: with open("display_chart.html", "w") as file:
             file.write(display_html)

         print("Files generated successfully: display_chart.html & sentiment_distribution.html")
```

```
Files generated successfully: display_chart.html & sentiment_distribution.html
```

```python
In [ ]:
```