Web Scrapping Data Mining Project

March 22, 2024

1 Web Scraping Reddit Using Praw Package and Reddit apps API

[22]:
```
import praw
import csv
from datetime import datetime

# Initialize PRAW with your Reddit app credentials
reddit = praw.Reddit(
    client_id="arr32sSYSTUkkgugEdShVQ",
    client_secret="moz5DTxGYrDBX1O496uJmZKH2bB80w",
    user_agent="Wise Shopper",
)

def convert_timestamp(timestamp):
    return datetime.utcfromtimestamp(timestamp)

# Define a function to write data to a CSV file
def write_to_csv(csv_file_path, data, fieldnames):
    with open(csv_file_path, 'w', newline='', encoding='utf-8') as csv_file:
        writer = csv.DictWriter(csv_file, fieldnames=fieldnames)
        writer.writeheader()
        writer.writerows(data)

# Specify the URLs of the posts you want to scrape
post_urls = [
    'https://www.reddit.com/r/LinusTechTips/comments/17synze/
 ↪is_ryzen_7_7800x3d_really_that_good/',
    'https://www.reddit.com/r/Amd/comments/18f5j13/ryzen_7_7800x3d_is_the_goat/
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    'https://www.reddit.com/r/buildapc/comments/12clszu/
 ↪amd_ryzen_7_7800x3d_review_megathread/',
    'https://www.reddit.com/r/Amd/comments/18ogzwt/
 ↪amd_ryzen_7_7800x3d_vs_intel_core_i914900k/',
    'https://www.reddit.com/r/Amd/comments/13kdel9/
 ↪ryzen_7_7800x3d_is_it_worth_the_risk/',
    'https://www.reddit.com/r/buildapcsales/comments/17qfp96/
 ↪cpu_amd_ryzen_7_7800x3d_299_microcenter_instore/',
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   'https://www.reddit.com/r/buildapc/comments/17z7m6j/
↪get_ryzen_7_7800x3d_or_wait_for_next_gen/',
   'https://www.reddit.com/r/buildapc/comments/1ae09h8/
↪regarding_the_ryzen_7800x3d_performances_overall/',
   'https://www.reddit.com/r/hardware/comments/12hth3b/
↪amd_ryzen_7_7800x3d_meta_review/',
   'https://www.reddit.com/r/buildmeapc/comments/18oczer/
↪is_amd_ryzen_7_7800x3d_cpu_bad/',
   'https://www.reddit.com/r/buildapcsales/comments/108alzt/
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   'https://www.reddit.com/r/intel/comments/17kxa0n/
↪is_intel_i513400f_worth_it_over_i713700f_for_212/',
   'https://www.reddit.com/r/buildmeapc/comments/152zq1a/
↪opinions_on_this_intel_core_i5_13400fasus_geforce/',
   'https://www.reddit.com/r/buildapcsales/comments/12vf1z0/
↪cpu_intel_core_i513400f_17999_ebay_antonline/',
   'https://www.reddit.com/r/hardware/comments/10fb1vr/
↪intel_core_i513400f_cpu_review_mainstream_magic/',
   'https://www.reddit.com/r/buildapc/comments/158p2k9/
↪intel_core_i5_13400f_or_i5_12600k/',
   'https://www.reddit.com/r/intel/comments/16cd6mw/i513400f_with_ddr5_5200mhz/
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   'https://www.reddit.com/r/buildapc/comments/16h1wpo/
↪is_the_i5_13400f_too_weak_for_a_rtx_4070/',
   'https://www.reddit.com/r/hardware/comments/11kimn9/
↪tpu_intel_core_i513400f_review_force_of_efficiency/',
   'https://www.reddit.com/r/intel/comments/11k99ga/ddr5_6000mts_with_i513400f/
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↪cpu_intel_core_i5_13600k_300_amazon/',
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   'https://www.reddit.com/r/intel/comments/wabz37/
↪intel_core_i713700k_and_core_i513600k_tested/',
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↪buy_intel_i9_13900k_or_wait_for_amd_ryzen_9/',
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↪intels_13th_gen_core_i913900k_will_pack_24_cores/',
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↪95c_is_now_normal_amd_ryzen_9_7950x_cpu_review/',
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↪honest_advice_ryzen_7950x_if_i_knew_how_good_it/',
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↪its_official_amd_ryzen_7_5800x3d_does_not_support/',
   'https://www.reddit.com/r/Amd/comments/1adws8c/
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↪the_latest_amd_ryzen_7_8700g_and_ryzen_5_8600g/',
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↪amd_ryzen_7_8700g_linux_performance_review/',
   'https://www.reddit.com/r/Amd/comments/1aeiipp/
↪amd_ryzen_7_8700g_and_ryzen_5_8600g_review/',
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    'https://www.reddit.com/r/pcmasterrace/comments/18f20vi/
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    'https://www.reddit.com/r/Amd/comments/xjanl4/
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    'https://www.reddit.com/r/buildapc/comments/10e4fnl/
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    'https://www.reddit.com/r/pcmasterrace/comments/q3uaza/
↪ryzen_5_5600x_rtx_3080_op/',
    'https://www.reddit.com/r/buildapc/comments/185obem/
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    'https://www.reddit.com/r/buildapcsales/comments/oku1lf/
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    'https://www.reddit.com/r/Amd/comments/zuvct5/
↪amd_ryzen_5_5600x_is_four_times_as_popular_as/',
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    'https://www.reddit.com/r/buildapc/comments/15r5mq1/
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    'https://www.reddit.com/r/buildapcsales/comments/seru6s/
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    'https://www.reddit.com/r/buildapcsales/comments/lfzc3h/
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    'https://www.reddit.com/r/nvidia/comments/y18mw3/
↪hwub_geforce_rtx_4090_review_nvidias_stupid_fast/',
    'https://www.reddit.com/r/hardware/comments/xwxxlx/
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    'https://www.reddit.com/r/nvidia/comments/zheepi/
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    'https://www.reddit.com/r/hardware/comments/12jlrnp/
 ↪nvidia_geforce_rtx_4070_review_a_solid_but/',
    'https://www.reddit.com/r/hardware/comments/108ay99/
 ↪nvidia_geforce_rtx_4070_ti_meta_review/',
    'https://www.reddit.com/r/nvidia/comments/12idk6a/
 ↪nvidia_geforce_rtx_4070_matches_geforce_rtx_3080/',
    'https://www.reddit.com/r/hardware/comments/16ijkal/
 ↪nvidia_geforce_rtx_4070_could_see_price_cuts_to/',
    'https://www.reddit.com/r/nvidia/comments/12pc774/
 ↪damn_i_bought_a_rtx_4070_msi_ventus_x3/',
    'https://www.reddit.com/r/GamingLeaksAndRumours/comments/11s1bid/
 ↪nvidia_geforce_rtx_4070_rumored_to_launch_at_749/',
    'https://www.reddit.com/r/PcBuild/comments/18xvgpj/
 ↪rog_strix_geforce_rtx_4070_review/'
    # Add more post URLs as needed
]

products = [
    ("AMD Ryzen 7 7800X3D", "Processor"),
    ("Intel Core i5 13400F", "Processor"),
    ("Intel Core i5 13600K", "Processor"),
    ("Intel Core i9 13900K", "Processor"),
    ("AMD Ryzen 9 7950X", "Processor"),
```

```
    ("AMD Ryzen 7 5800X3D", "Processor"),
    ("AMD Ryzen 7 8700G", "Processor"),
    ("AMD Ryzen 5 7600x", "Processor"),
    ("AMD Ryzen 5 5600x", "Processor"),
    ("Nvidia GeForce RTX 4090", "Graphics Processing Unit"),
    ("AMD Radeon RX 7900 XTX", "Graphics Processing Unit"),
    ("Nvidia GeForce RTX 4070 Super", "Graphics Processing Unit"),
    ("AMD Radeon RX 7800 XT", "Graphics Processing Unit"),
    ("AMD Radeon RX 6700 XT", "Graphics Processing Unit"),
    ("Nvidia RTX 4060 Ti", "Graphics Processing Unit"),
    ("Nvidia GeForce RTX 4070", "Graphics Processing Unit")
]

# Create a new list to store the multiplied elements
multiplied_products = []

# Iterate through each product and multiply it by 10
for product, category in products:
    for _ in range(10):
        multiplied_products.append((product, category))

# Product information (optional, fill in with your specific product details)
# product_name = "AMD Ryzen 7 7800X3D"
# product_category = "Processor"

# Timestamp
timestamp = datetime.now().strftime("%Y-%m-%d %H:%M:%S")

# Prepare lists to store post and comment data
post_data = []
comment_data = []

for post_url in post_urls:
    # Retrieve the submission object using the post URL
    submission = reddit.submission(url=post_url)

    product_name, product_category = multiplied_products.pop(0) if␣
 ↪multiplied_products else ("N/A", "N/A")

    # Add post information to the post_data list
    post_data.append({
        'Submission ID': submission.id,
        'Post Title': submission.title,
        'Post URL': submission.url,
        'Author': submission.author.name if submission.author else "[deleted]",
        'Score': submission.score,
        'Number of Comments': submission.num_comments,
```

```
        'Upvote Ratio': submission.upvote_ratio,
        'Submission Text': submission.selftext,
        'Product Name': product_name,
        'Product Category': product_category,
        'Posting Time': convert_timestamp(submission.created_utc)
    })

    # Add comment information to the comment_data list
    for comment in submission.comments:
        if isinstance(comment, praw.models.Comment):  # Filter out MoreComments␣
 ↪objects
            comment_data.append({
                'Comment ID': comment.id,
                'Parent ID': comment.parent_id,
                'Comment Body': comment.body,
                'Author': comment.author.name if comment.author else␣
 ↪"[deleted]",
                'Score': comment.score,
                'Product Name': product_name,
                'Product Category': product_category,
                'Posting Time': convert_timestamp(submission.created_utc)
            })

# Write post data to a CSV file
post_csv_file_path = "post_data.csv"
write_to_csv(post_csv_file_path, post_data, fieldnames=['Submission ID', 'Post␣
 ↪Title', 'Post URL', 'Author', 'Score', 'Number of Comments', 'Upvote Ratio',␣
 ↪'Submission Text', 'Product Name', 'Product Category', 'Posting Time'])
print("Post data saved to", post_csv_file_path)

# Write comment data to a CSV file
comment_csv_file_path = "comment_data.csv"
write_to_csv(comment_csv_file_path, comment_data, fieldnames=['Comment ID',␣
 ↪'Parent ID', 'Comment Body', 'Author', 'Score', 'Product Name', 'Product␣
 ↪Category', 'Posting Time'])
print("Comment data saved to", comment_csv_file_path)
```

```
Post data saved to post_data.csv
Comment data saved to comment_data.csv
```

1.1 Importing Libraries

[23]:
```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
```

1.2 Reading CSVs

[24]:
```
file_path_post_data ='/Users/mayureshdongare/Desktop/CU Docs/Data Mining CSCI␣
 ↪5502/Data Mining Project/post_data.csv'
file_path_comment_data ='/Users/mayureshdongare/Desktop/CU Docs/Data Mining␣
 ↪CSCI 5502/Data Mining Project/comment_data.csv'

post_data = pd.read_csv(file_path_post_data)
comment_data = pd.read_csv(file_path_comment_data)
```

[25]:
```
post_data.head()
```

[25]:

	Submission ID	Post Title	Post URL	Author	Score	Number of Comments	Upvote Ratio	Submission Text	Product Name	Product Category	Posting Time
0	17synze	Is Ryzen 7 7800x3D really that good?	https://www.reddit.com/r/LinusTechTips/comment…	ro3rr	39	85	0.76	I have seen that a higher cache, such as x3d, …	AMD Ryzen 7 7800X3D	Processor	2023-11-11 17:01:47
1	18f5j13	Ryzen 7 7800X3D is the GOAT	https://www.reddit.com/r/Amd/comments/18f5j13/…	Mopar_63	530	267	0.91	I do not know what voodoo AMD did with this ch…	AMD Ryzen 7 7800X3D	Processor	2023-12-10 15:05:59
2	12clszu	AMD Ryzen 7 7800X3D review megathread	https://www.reddit.com/r/buildapc/comments/12c…	inversion_modz	471	325	0.97	Hello everybody! \n\n \n\nThe AMD Ry…	AMD Ryzen 7 7800X3D	Processor	2023-04-05 14:16:04
3	18ogzwt	AMD Ryzen 7 7800X3D vs. Intel Core i9-14900K	https://www.techspot.com/review/2783-ryzen-780…	Stiven_Crysis	383	339	0.95	NaN	AMD Ryzen 7 7800X3D	Processor	2023-12-22 15:06:53
4	13kdel9	Ryzen 7 7800X3D is it worth the risk???	https://www.reddit.com/r/Amd/comments/13kdel9/…	Alarmed-Bad7994	17	66	0.69	Hello!!! I am in the processing of building a …	AMD Ryzen 7 7800X3D	Processor	2023-05-17 20:39:53

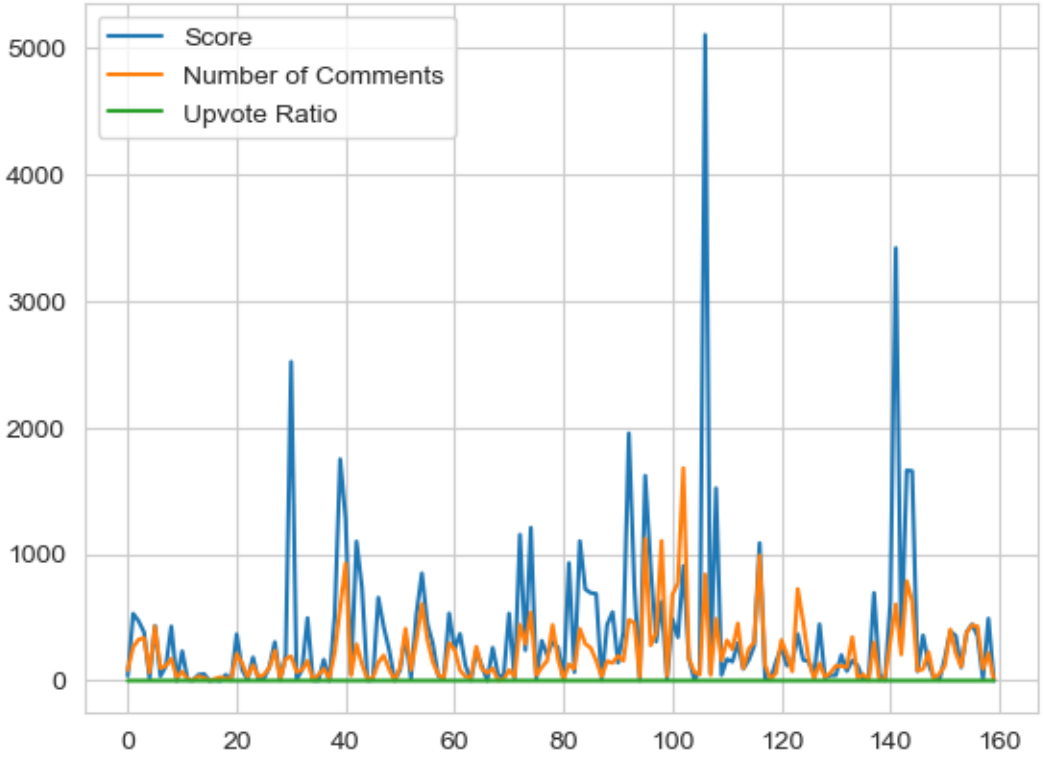
[26]:
```
post_data.describe()
```

[26]:

	Score	Number of Comments	Upvote Ratio
count	160.000000	160.000000	160.000000
mean	376.231250	216.600000	0.863375
std	623.316674	254.123038	0.118809
min	0.000000	3.000000	0.330000
25%	28.500000	46.500000	0.810000
50%	169.000000	127.000000	0.910000
75%	445.250000	300.000000	0.940000
max	5103.000000	1680.000000	1.000000

[27]:
```
post_data.plot()
```

[27]: <Axes: >



[28]:
```
post_data.columns
```

[28]:
```
Index(['Submission ID', 'Post Title', 'Post URL', 'Author', 'Score',
       'Number of Comments', 'Upvote Ratio', 'Submission Text', 'Product Name',
       'Product Category', 'Posting Time'],
      dtype='object')
```

[29]:
```
comment_data.head()
```

[29]:
```
  Comment ID   Parent ID                                       Comment Body  \
0    k8t258c  t3_17synze  > I have also read a blog from UserBenchmark\n…
1    k8t248o  t3_17synze  Do not use userbenchmark it's trash and he hat…
2    k8t45x2  t3_17synze  userbenchmark is not to be trusted for their o…
3    k8t98ke  t3_17synze  The person running userbenchmark seems to have…
4    k8t7gd8  t3_17synze  Userbenchmark used to have fairly balanced rev…

                 Author  Score         Product Name Product Category  \
0              bloodem    153  AMD Ryzen 7 7800X3D        Processor
1  aggressiveturdbuckle    248  AMD Ryzen 7 7800X3D        Processor
2              Izan_TM    125  AMD Ryzen 7 7800X3D        Processor
3           KrisKorona     46  AMD Ryzen 7 7800X3D        Processor
4           ManyPandas     24  AMD Ryzen 7 7800X3D        Processor

          Posting Time
0  2023-11-11 17:01:47
1  2023-11-11 17:01:47
2  2023-11-11 17:01:47
3  2023-11-11 17:01:47
4  2023-11-11 17:01:47
```

[30]:
```
post_data.columns
```

[30]:
```
Index(['Submission ID', 'Post Title', 'Post URL', 'Author', 'Score',
       'Number of Comments', 'Upvote Ratio', 'Submission Text', 'Product Name',
       'Product Category', 'Posting Time'],
      dtype='object')
```

[31]:
```
comment_data.columns
```

[31]:
```
Index(['Comment ID', 'Parent ID', 'Comment Body', 'Author', 'Score',
       'Product Name', 'Product Category', 'Posting Time'],
      dtype='object')
```

[32]:
```
comment_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5564 entries, 0 to 5563
Data columns (total 8 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   Comment ID        5564 non-null   object
 1   Parent ID         5564 non-null   object
 2   Comment Body      5564 non-null   object
 3   Author            5564 non-null   object
 4   Score             5564 non-null   int64
```

```
 5   Product Name      5564 non-null   object
 6   Product Category  5564 non-null   object
 7   Posting Time      5564 non-null   object
dtypes: int64(1), object(7)
memory usage: 347.9+ KB
```

[33]:
```
comment_data.describe()
```

[33]:
```
              Score
count  5564.000000
mean     20.741373
std     152.116225
min     -44.000000
25%       1.000000
50%       2.000000
75%       7.000000
max    9071.000000
```

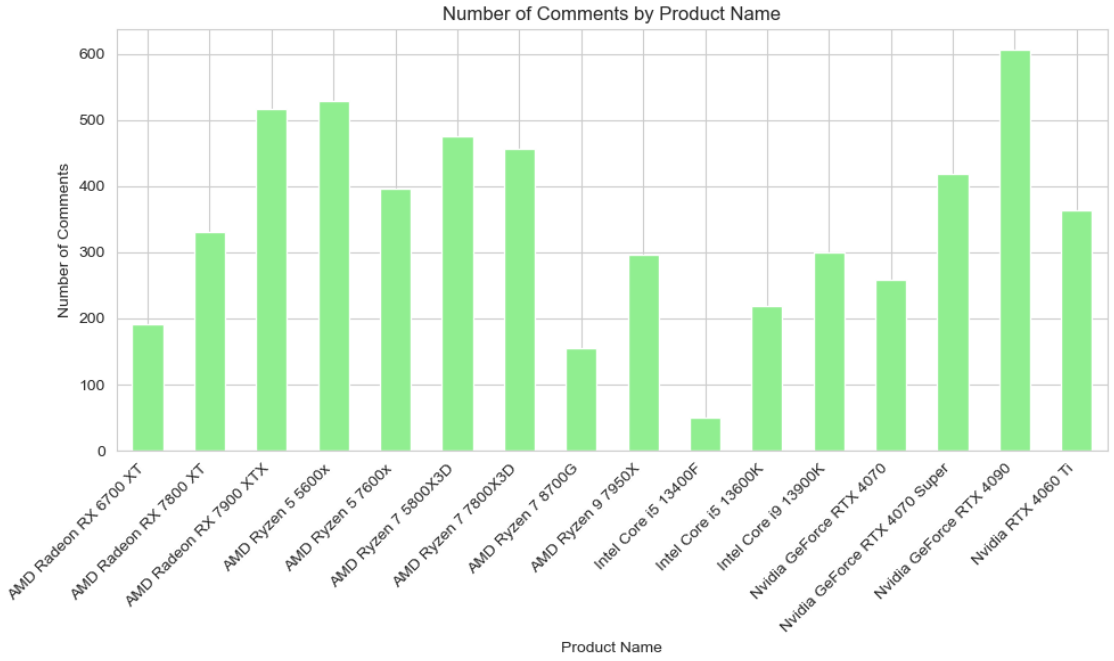
[34]:
```
post_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 160 entries, 0 to 159
Data columns (total 11 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   Submission ID       160 non-null    object
 1   Post Title          160 non-null    object
 2   Post URL            160 non-null    object
 3   Author              160 non-null    object
 4   Score               160 non-null    int64
 5   Number of Comments  160 non-null    int64
 6   Upvote Ratio        160 non-null    float64
 7   Submission Text     66 non-null     object
 8   Product Name        160 non-null    object
 9   Product Category    160 non-null    object
 10  Posting Time        160 non-null    object
dtypes: float64(1), int64(2), object(8)
memory usage: 13.9+ KB
```

1.3 Bar Chart of Comments by Product Name

[58]:
```
comments_by_category = comment_data.groupby('Product Name').size()
# Plot the bar chart
plt.figure(figsize=(10, 6))
comments_by_category.plot(kind='bar', color='lightgreen')
plt.title('Number of Comments by Product Name')
plt.xlabel('Product Name')
plt.ylabel('Number of Comments')
```

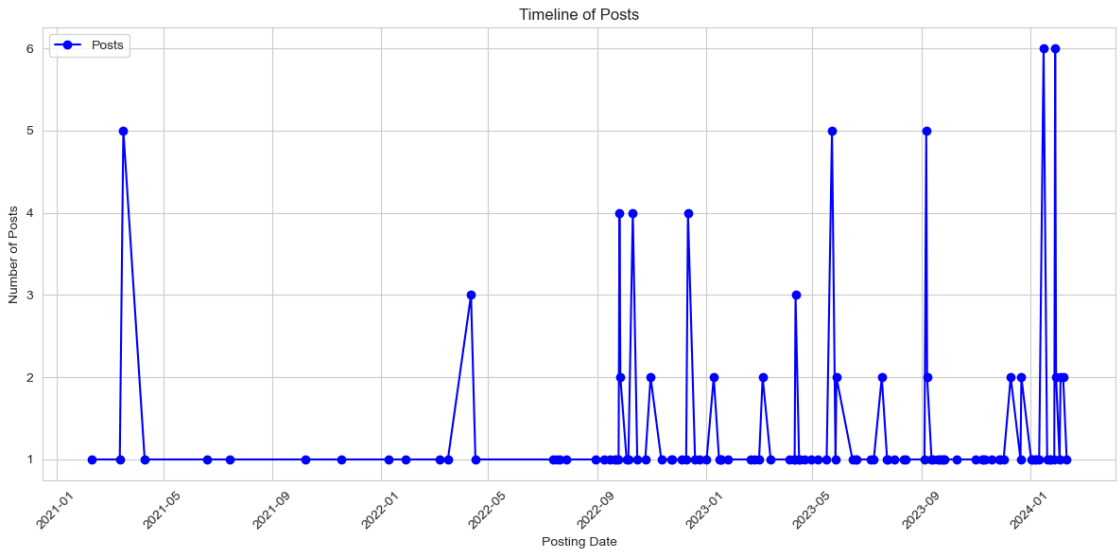
```
plt.xticks(rotation=45, ha='right')
plt.tight_layout()
plt.show()
```

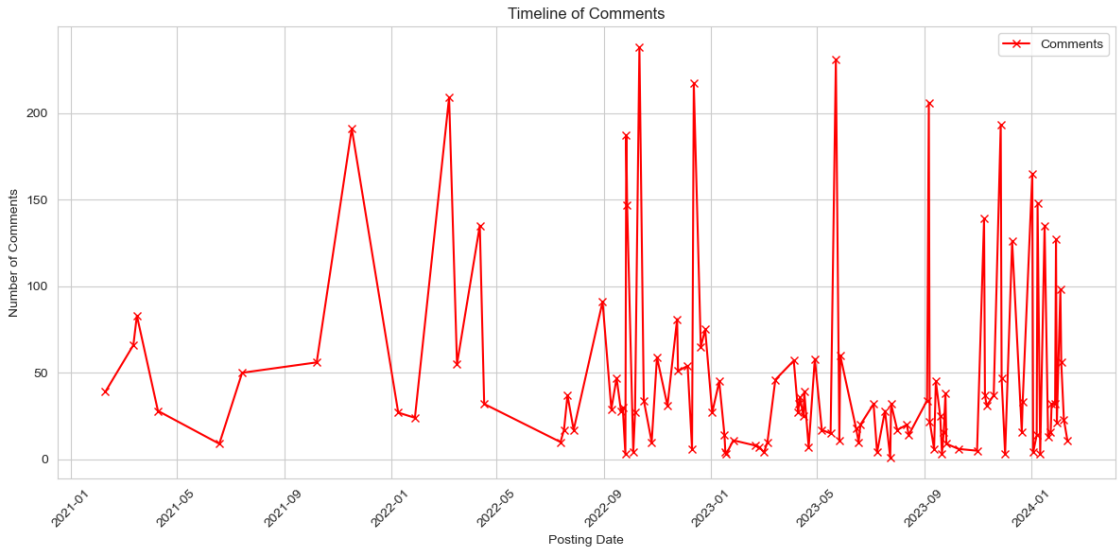


1.4 Timeline Plot of Post and Comments

[74]:
```
# Converting 'Posting Time' column to datetime
post_data['Posting Time'] = pd.to_datetime(post_data['Posting Time'])
comment_data['Posting Time'] = pd.to_datetime(comment_data['Posting Time'])

# Extracting date and count of posts
post_dates = post_data['Posting Time'].dt.date
post_counts = post_dates.value_counts().sort_index()

# Extracting date and count of comments
comment_dates = comment_data['Posting Time'].dt.date
comment_counts = comment_dates.value_counts().sort_index()

# Plotting timeline of posts
plt.figure(figsize=(12, 6))
plt.plot(post_counts.index, post_counts.values, color='blue', marker='o',␣
 ↪linestyle='-', label='Posts')
plt.title('Timeline of Posts')
plt.xlabel('Posting Date')
plt.ylabel('Number of Posts')
```

```
plt.xticks(rotation=45)
plt.grid(True)
plt.legend()
plt.tight_layout()
plt.show()

# Plotting timeline of comments
plt.figure(figsize=(12, 6))
plt.plot(comment_counts.index, comment_counts.values, color='red', marker='x',␣
 ↪linestyle='-', label='Comments')
plt.title('Timeline of Comments')
plt.xlabel('Posting Date')
plt.ylabel('Number of Comments')
plt.xticks(rotation=45)
plt.grid(True)
plt.legend()
plt.tight_layout()
plt.show()
```

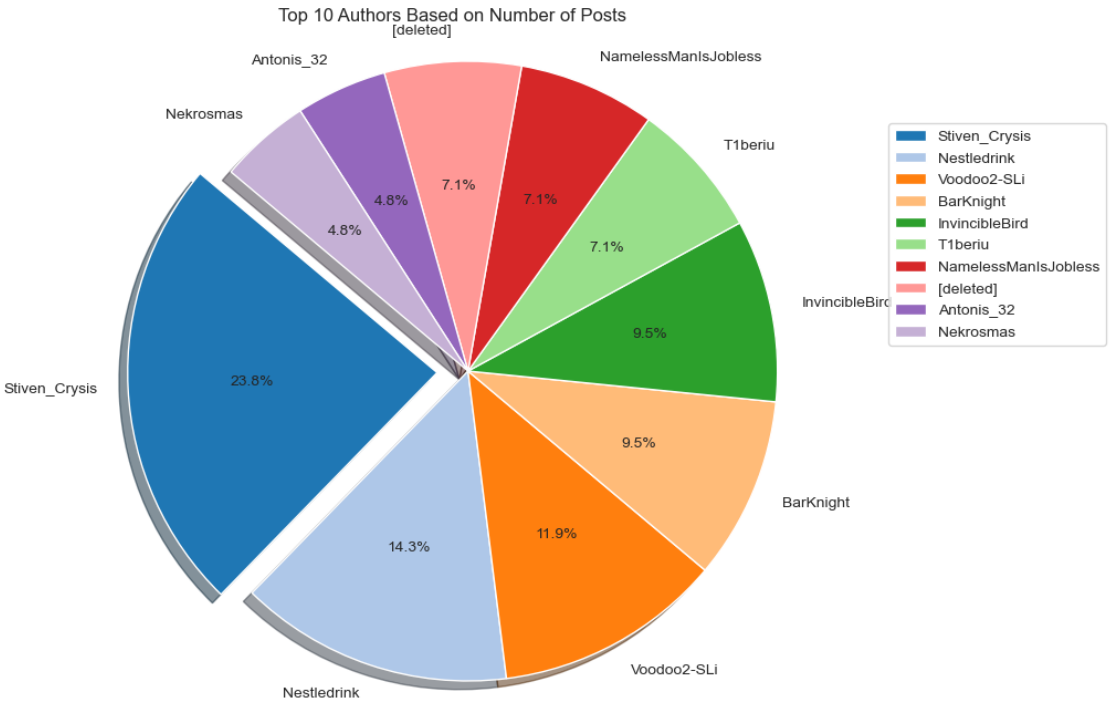




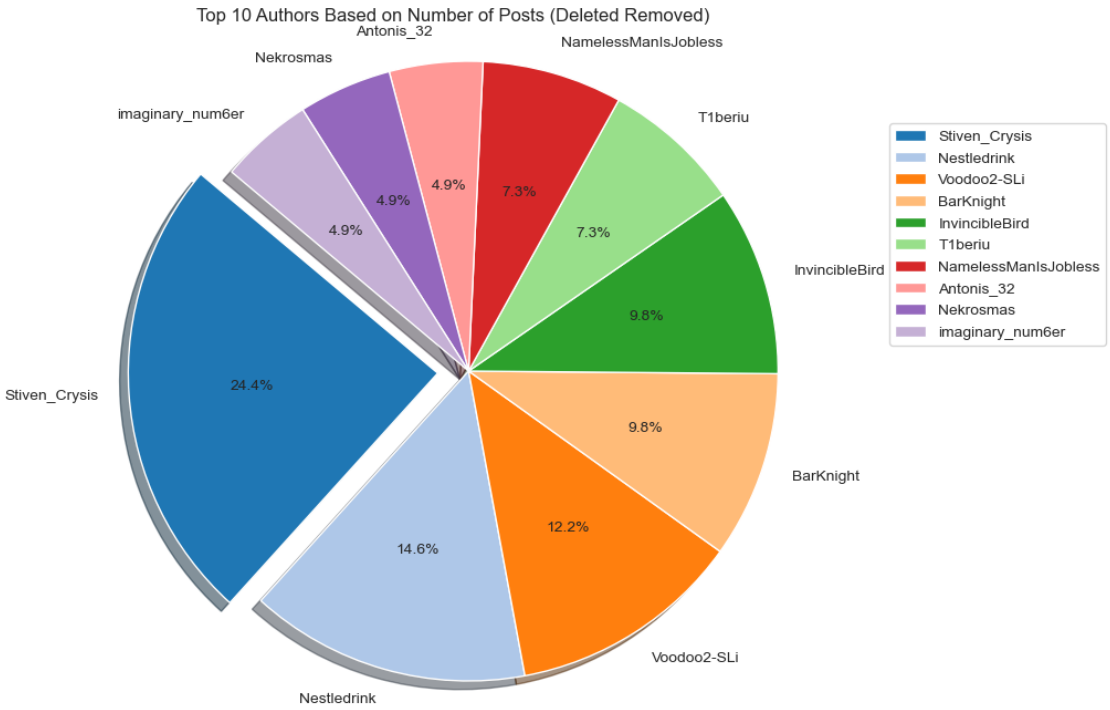
1.5 Top Authors in post and comments Analysis

[68]:
```
post_counts = post_data['Author'].value_counts().drop('[deleted]').head(10)
comment_counts = comment_data['Author'].value_counts().drop('[deleted]').
 ↪head(10)
```

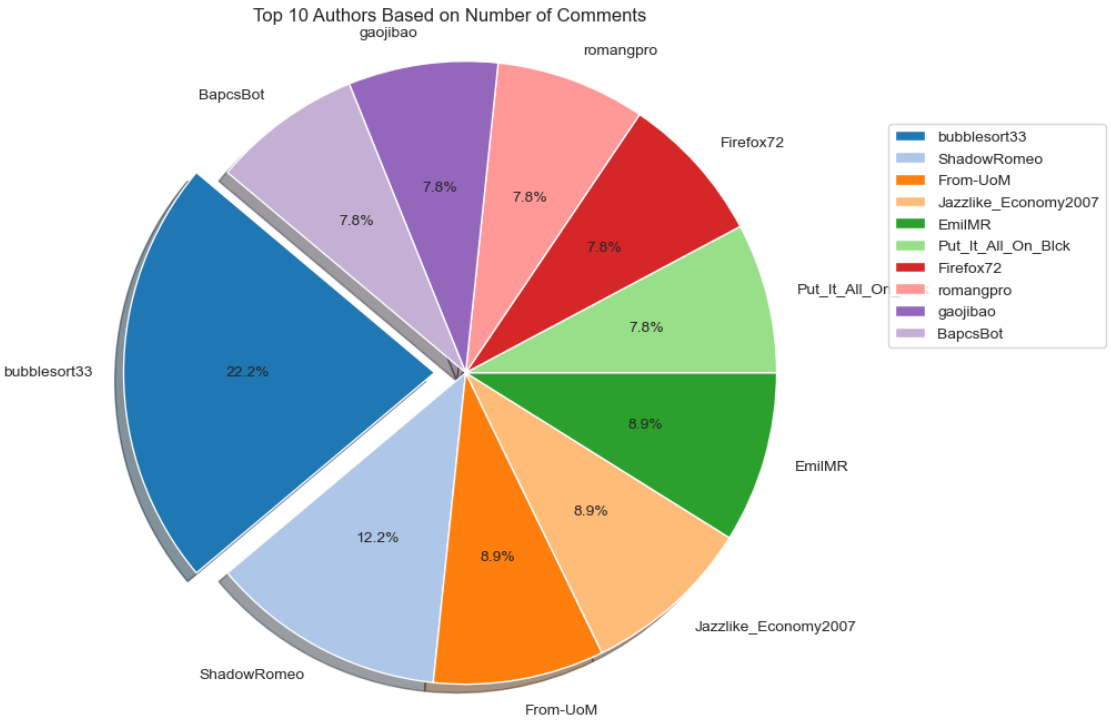
[63]:
```
colors = plt.cm.tab20.colors[:len(post_counts)]

# Plotting top 10 authors based on posts using a pie chart
plt.figure(figsize=(10, 8))
plt.pie(post_counts, labels=post_counts.index, autopct='%1.1f%%',␣
 ↪startangle=140,
        colors=colors, explode=[0.1] + [0] * (len(post_counts) - 1),␣
 ↪shadow=True)
plt.title('Top 10 Authors Based on Number of Posts')
plt.axis('equal')
plt.legend(bbox_to_anchor=(1, 0.7), loc="center left")
plt.show()
```



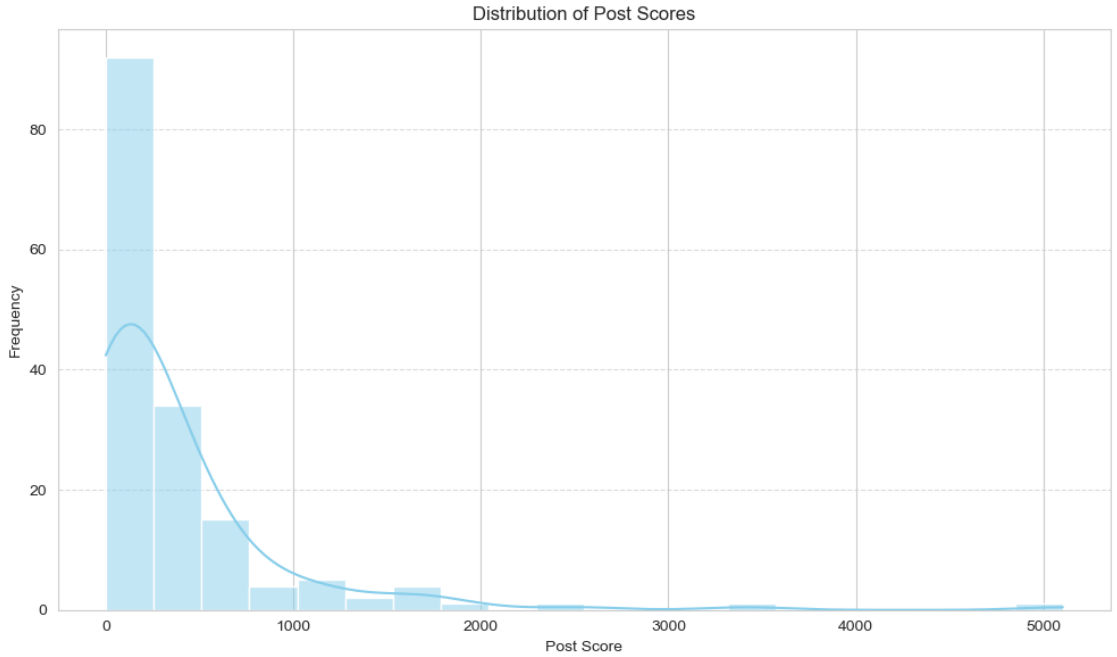
[70]:
```
colors = plt.cm.tab20.colors[:len(post_counts)]

# Plotting top 10 authors based on posts using a pie chart
plt.figure(figsize=(10, 8))
plt.pie(post_counts, labels=post_counts.index, autopct='%1.1f%%',␣
 ↪startangle=140,
        colors=colors, explode=[0.1] + [0] * (len(post_counts) - 1),␣
 ↪shadow=True)
plt.title('Top 10 Authors Based on Number of Posts (Deleted Removed)')
plt.axis('equal')
plt.legend(bbox_to_anchor=(1, 0.7), loc="center left")
plt.show()
```



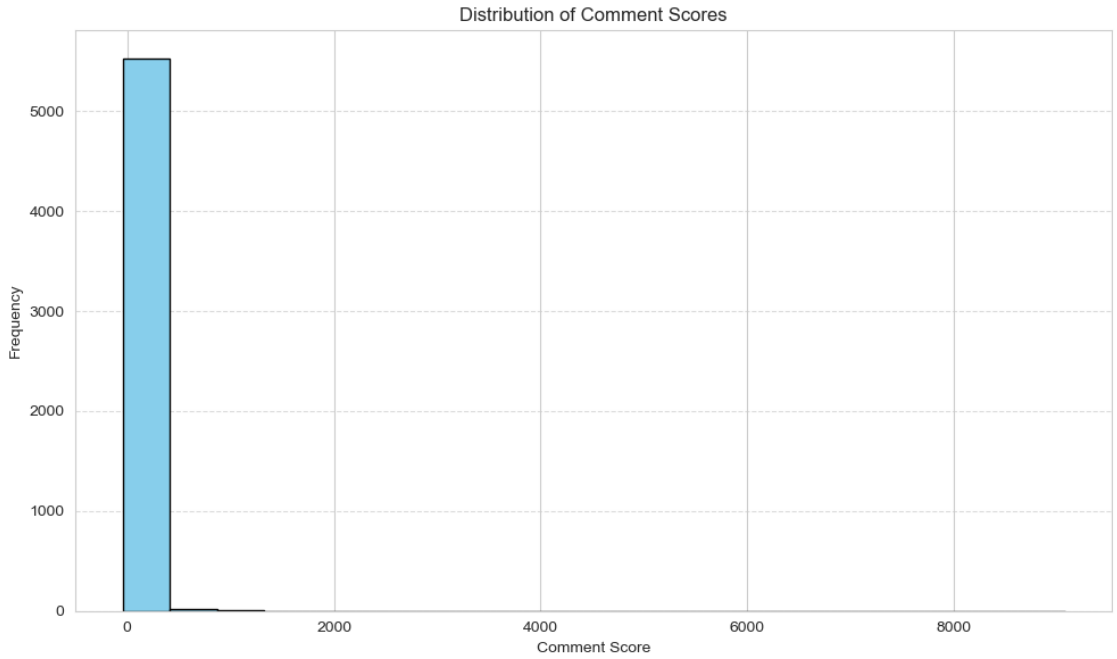
[66]:
```
colors = plt.cm.tab20.colors[:len(comment_counts)]

# Plotting top 10 authors based on comments using a pie chart
plt.figure(figsize=(10, 8))
plt.pie(comment_counts, labels=comment_counts.index, autopct='%1.1f%%',␣
 ↪startangle=140,
        colors=colors, explode=[0.1] + [0] * (len(comment_counts) - 1),␣
 ↪shadow=True)
plt.title('Top 10 Authors Based on Number of Comments')
plt.axis('equal')

# Add legend
plt.legend(bbox_to_anchor=(1, 0.7), loc="center left")

plt.show()
```



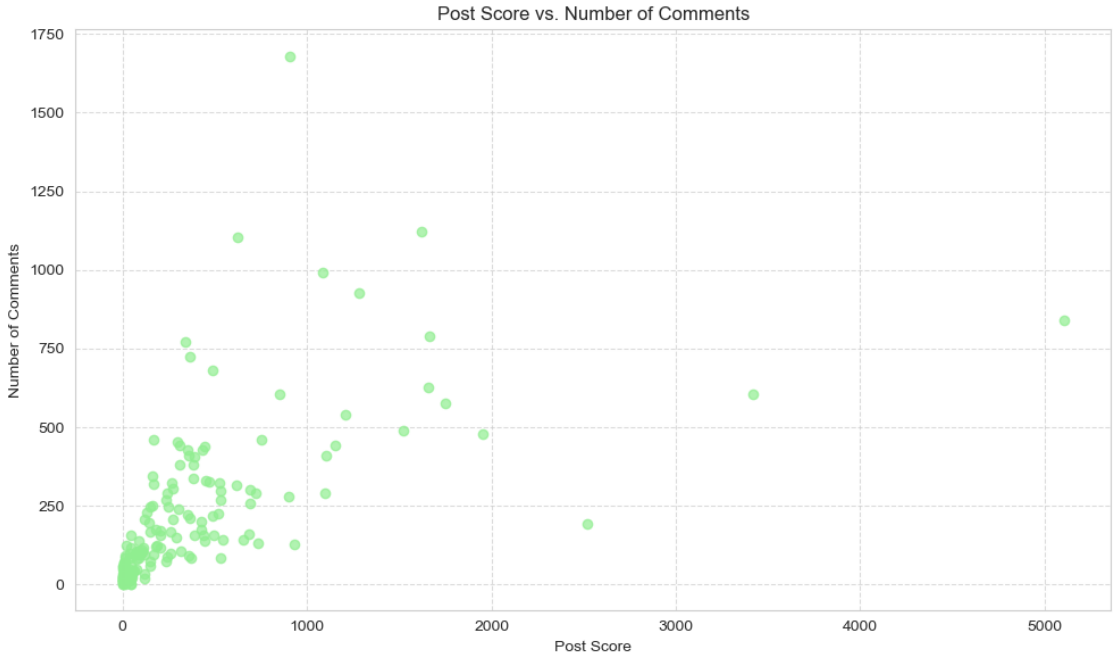
[36]:
```
sns.set_style("whitegrid")

# Plot the histogram
plt.figure(figsize=(10, 6))
sns.histplot(post_data['Score'], bins=20, color='skyblue', kde=True)
plt.title('Distribution of Post Scores')
plt.xlabel('Post Score')
plt.ylabel('Frequency')
plt.grid(axis='y', linestyle='--', alpha=0.7)
plt.tight_layout()
plt.show()
```



[37]:
```
# Plot the histogram
plt.figure(figsize=(10, 6))
plt.hist(comment_data['Score'], bins=20, color='skyblue', edgecolor='black')
plt.title('Distribution of Comment Scores')
plt.xlabel('Comment Score')
plt.ylabel('Frequency')
plt.grid(axis='y', linestyle='--', alpha=0.7)
plt.tight_layout()
plt.show()
```

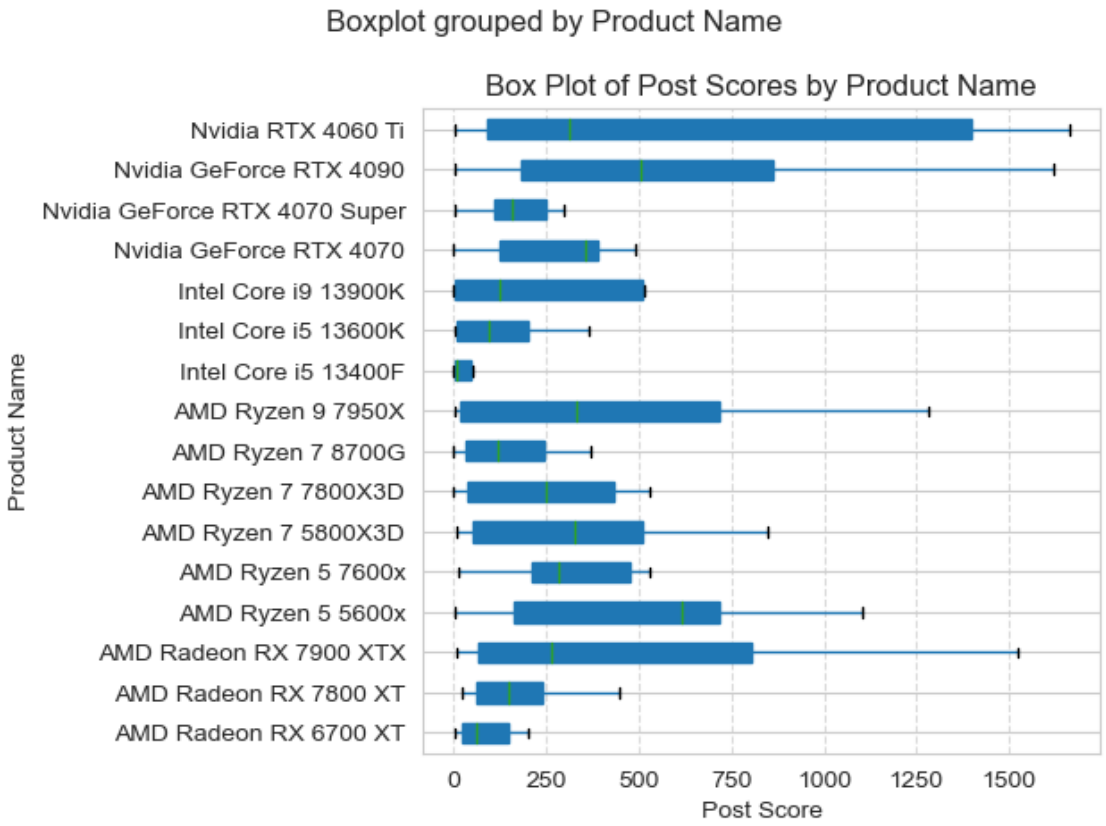


[38]:
```
plt.figure(figsize=(10, 6))
plt.scatter(post_data['Score'], post_data['Number of Comments'],␣
 ↪color='lightgreen', alpha=0.7)
plt.title('Post Score vs. Number of Comments')
plt.xlabel('Post Score')
plt.ylabel('Number of Comments')
plt.grid(True, linestyle='--', alpha=0.7)
plt.tight_layout()
plt.show()
```



[39]:
```
plt.figure(figsize=(10, 6))
post_data.boxplot(column='Score', by='Product Name', vert=False,␣
 ↪patch_artist=True, showfliers=False)
plt.title('Box Plot of Post Scores by Product Name')
plt.xlabel('Post Score')
plt.ylabel('Product Name')
plt.grid(axis='x', linestyle='--', alpha=0.7)
plt.tight_layout()
plt.show()
```

```
<Figure size 1000x600 with 0 Axes>
```



[19]:
```
pip install wordcloud
```

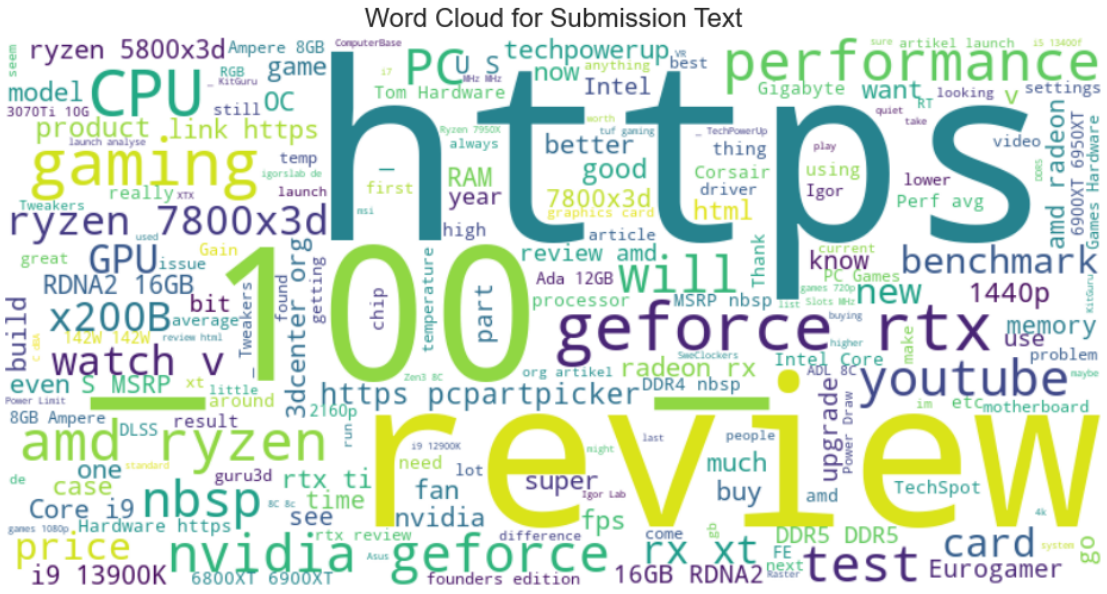
```
Requirement already satisfied: wordcloud in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (1.9.3)
Requirement already satisfied: numpy>=1.6.1 in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from wordcloud)
(1.24.3)
Requirement already satisfied: pillow in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from wordcloud)
(9.4.0)
Requirement already satisfied: matplotlib in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from wordcloud)
(3.7.1)
Requirement already satisfied: contourpy>=1.0.1 in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from
matplotlib->wordcloud) (1.0.5)
Requirement already satisfied: cycler>=0.10 in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from
matplotlib->wordcloud) (0.11.0)
Requirement already satisfied: fonttools>=4.22.0 in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from
```

```
matplotlib->wordcloud) (4.25.0)
Requirement already satisfied: kiwisolver>=1.0.1 in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from
matplotlib->wordcloud) (1.4.4)
Requirement already satisfied: packaging>=20.0 in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from
matplotlib->wordcloud) (23.0)
Requirement already satisfied: pyparsing>=2.3.1 in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from
matplotlib->wordcloud) (3.0.9)
Requirement already satisfied: python-dateutil>=2.7 in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from
matplotlib->wordcloud) (2.8.2)
Requirement already satisfied: six>=1.5 in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from python-
dateutil>=2.7->matplotlib->wordcloud) (1.16.0)
Note: you may need to restart the kernel to use updated packages.
```

1.6 Word Clound for Posts and Comments on Reddit Posts

[48]:
```
from wordcloud import WordCloud, STOPWORDS
```

[52]:
```
stopwords = set(STOPWORDS)

# Generate word cloud with customized parameters
wordcloud = WordCloud(width=800, height=400, background_color='white',
                      max_words=200, stopwords=stopwords,
                      colormap='viridis', contour_color='steelblue',
                      contour_width=1).generate(submission_text)

# Display the word cloud
plt.figure(figsize=(12, 6))
plt.imshow(wordcloud, interpolation='bilinear')
plt.title('Word Cloud for Submission Text', fontsize=16)
plt.axis('off')
plt.show()
```



[45]:
```
pip install textblob
```

```
Collecting textblob
  Downloading textblob-0.18.0.post0-py3-none-any.whl (626 kB)
                             626.3/626.3

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Collecting nltk>=3.8 (from textblob)
  Downloading nltk-3.8.1-py3-none-any.whl (1.5 MB)
                             1.5/1.5 MB
34.0 MB/s eta 0:00:0000:01
Requirement already satisfied: click in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from
nltk>=3.8->textblob) (8.0.4)
Requirement already satisfied: joblib in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from
nltk>=3.8->textblob) (1.2.0)
Requirement already satisfied: regex>=2021.8.3 in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from
nltk>=3.8->textblob) (2022.7.9)
Requirement already satisfied: tqdm in
/Users/mayureshdongare/anaconda3/lib/python3.11/site-packages (from
nltk>=3.8->textblob) (4.65.0)
Installing collected packages: nltk, textblob
  Attempting uninstall: nltk
    Found existing installation: nltk 3.7
    Uninstalling nltk-3.7:
      Successfully uninstalled nltk-3.7
```

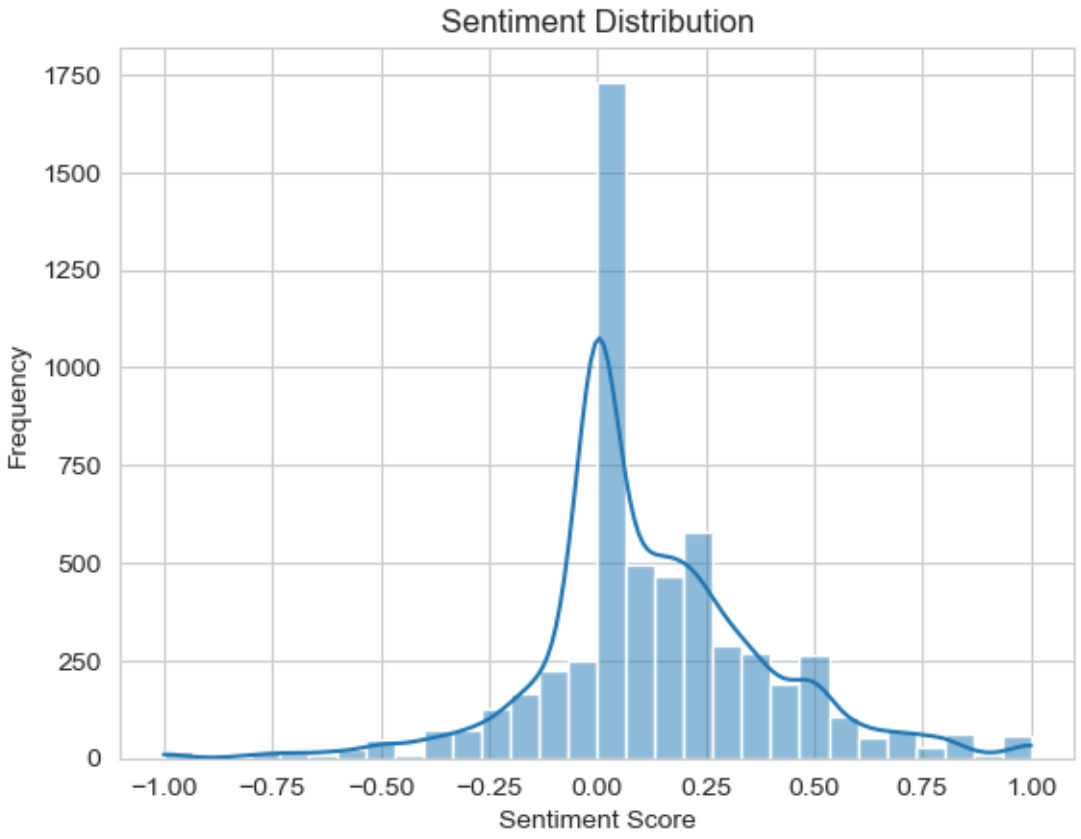
```
Successfully installed nltk-3.8.1 textblob-0.18.0.post0
Note: you may need to restart the kernel to use updated packages.
```

[53]:
```
from textblob import TextBlob

# Perform sentiment analysis on 'Submission Text' and 'Comment Body' columns
post_data['Text Sentiment'] = post_data['Submission Text'].apply(lambda x:␣
 ↪TextBlob(str(x)).sentiment.polarity)
comment_data['Text Sentiment'] = comment_data['Comment Body'].apply(lambda x:␣
 ↪TextBlob(str(x)).sentiment.polarity)

# Concatenate post and comment data
all_data = pd.concat([post_data, comment_data])

# Visualize the sentiment distribution using a histogram
sns.histplot(all_data['Text Sentiment'], bins=30, kde=True)
plt.title('Sentiment Distribution')
plt.xlabel('Sentiment Score')
plt.ylabel('Frequency')
plt.show()
```

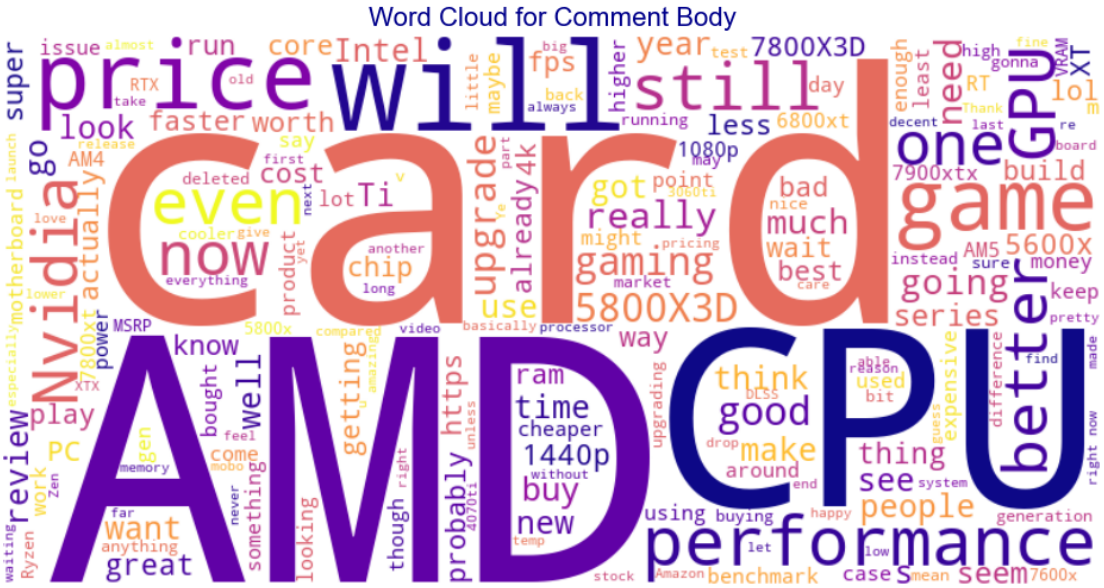


[55]:
```
# Concatenating the comment bodies and remove any NaN values
comment_text = comment_data['Comment Body'].dropna().str.cat(sep=' ')

# Removing common stopwords
stopwords = set(STOPWORDS)

# Generate word cloud with customized parameters
wordcloud = WordCloud(width=800, height=400, background_color='white',
                      max_words=200, stopwords=stopwords,
                      colormap='plasma', contour_color='darkred',
                      contour_width=2).generate(comment_text)

# Display the word cloud
plt.figure(figsize=(12, 6))
plt.imshow(wordcloud, interpolation='bilinear')
plt.title('Word Cloud for Comment Body', fontsize=16, color='darkblue')
plt.axis('off')
plt.show()
```



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