AMAZON BOOKS CURATION AND ANALYSIS

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INTRODUCTION

As the digital revolution continues to transform consumer habits, nowhere is this more evident than in the realm of book sales on Amazon, the preeminent leader in e-commerce. In a journey that spans a dynamic decade from 2009 to 2019, I embark on a captivating exploration of literary consumption. This project is not merely an analysis of sales; it's a chronicle of cultural shifts, a narrative of changing tastes, and a reflection of the digital zeitgeist. By juxtaposing the multitude of books presented for sale with the frequency of actual purchases, I aim to uncover the stories behind what readers choose to cherish, consume, and collect.

DATA CURATION

In [1]:

```
#impot libraries
import pandas as pd
from requests import get
from time import sleep
from random import randint
from selenium import webdriver
import numpy as np
from bs4 import BeautifulSoup
from pandas.plotting import scatter_matrix
import matplotlib.pyplot as plt
import seaborn as sns
```

In [4]:

```
# The amazon url

books_url = 'https://www.amazon.com/s?i=stripbooks&bbn=283155&rh=n%3A283155&s=review-count-rank&dc&Adv-Srch-Books-Submit.x=30&Adv-Srch-Books-Submit.y=21&qid=1602339864&unfiltered=1&ref=sr_ex_n_1'
```

In [ ]:

```
#Here, we want to get the link for all categories

driver = webdriver.Chrome("C:/Users/FLORENCE/Downloads/chromedriver_win32/chromedriver.exe")

# Navigate to the specified URL
driver.get(books_url)

# Introduce a random sleep to simulate human-like behavior and avoid being detected as a bot
sleep(randint(5, 15))

# Parse the HTML content of the page using BeautifulSoup
soup = BeautifulSoup(driver.page_source, 'html.parser')

# Extract all href attributes from anchor (a) tags and store them in category_urls
category_urls = [item.get("href") for item in soup.find_all("a")]

#Remove duplicates and nan values

urls = list(dict.fromkeys(category_urls))
```

```
urls = list(filter(None, urls))
```

In [ ]:

```
# Filter out URLs that start with '/s?i=stripbooks'
urls = [x for x in urls if x.startswith('/s?i=stripbooks')]

# Remove all links that end with 'browse-bin_1'
urls = [x for x in urls if not x.endswith('browse-bin_1')]

# Prefix each URL with the base string 'https://www.amazon.com/'
string = 'https://www.amazon.com/'
ulr_list = [string + s for s in urls]
```

In [ ]:

```
# Select the first 32 links from the final_list, as they are the ones to be recorded

ulr_list =ulr_list[:32]
```

In [ ]:

```
# Initialize an empty list to store the page URLs
page_list = []

# Loop through each URL in the final_urls list
for url in ulr_list:
    # Set up a new Chrome WebDriver for each URL
    driver = webdriver.Chrome("C:/Users/FLORENCE/Downloads/chromedriver_win32/chromedrive
r.exe")

    # Navigate to the current URL
    driver.get(url)

    # Introduce a random sleep to simulate human-like behavior and avoid being detected a
s a bot
    sleep(randint(5, 15))

    # Parse the HTML content of the page using BeautifulSoup
    soup = BeautifulSoup(driver.page_source, 'html.parser')

    # Extract all href attributes from anchor (a) tags and remove duplicates
    page_urls = list(dict.fromkeys([item.get("href") for item in soup.find_all("a")]))

    # Remove any empty strings from the list of URLs
    page_urls = list(filter(None, page_urls))

    # Filter URLs that start with '/s?i=stripbooks'
    url_final = [x for x in page_urls if x.startswith('/s?i=stripbooks')]

    # Remove URLs that end with 'hi_1'
    url_final = [x for x in url_final if not x.endswith('hi_1')]

    # Filter URLs that end with specified prefixes ('sr_pg_1', 'sr_pg_2', 'sr_pg_3')
    prefixes = ('sr_pg_1', 'sr_pg_2', 'sr_pg_3')
    url_final = [x for x in url_final if x.endswith(prefixes)]

    # Prefix each URL with 'https://www.amazon.com/' and store in final_list
    string = 'https://www.amazon.com/'
    final_url = [string + s for s in url_final]

    # Select the first 3 links from final_list, as they are the ones to be recorded
    final_pages = final_url[0:3]

    # Append the selected page URLs to the page_list
    page_list.append(final_url)
```

In [ ]:

```
# Let's convert  to  flat list.
flat_list = []
```

```
for sublist in page_list:
    for item in sublist:
        flat_list.append(item)
```

In [ ]:

```
# Empty lists to store the data we will extract from the links
titles = []      # To store book titles
authors = []     # To store authors' names
dates = []       # To store publication dates
stars = []       # To store star ratings
ratings = []     # To store customer ratings
prices = []      # To store book prices
categs = []      # To store book categories
```

In [ ]:

```
# Iterate through the links in flat_list and collect the wanted data.
for x in flat_list:
        driver = webdriver.Chrome("C:/Users/MAINGATE/Downloads/chromedriver_win32/chrome
driver.exe")
        driver.get(x)
        sleep(randint(2,10))
        from bs4 import BeautifulSoup
        soup = BeautifulSoup(driver.page_source, 'html.parser')
        containers = soup.find_all("div", class_ = "sg-col-20-of-24 s-result-item s-asin
sg-col-0-of-12 sg-col-28-of-32 sg-col-16-of-20 sg-col sg-col-32-of-36 sg-col-12-of-16 sg-
col-24-of-28")
        for container in containers:
            try:
                title1 = container.find("span", class_="a-size-medium a-color-base a-tex
t-normal").text
                titles.append(title1)

                if container.find("div", class_="a-row a-size-base a-color-secondary").f
ind("a", "a-size-base a-link-normal") is None:
                    authors.append(container.find("div", class_="a-row a-size-base a-col
or-secondary").find_all("span", class_="a-size-base")[2].text)
                elif container.find("div", class_="a-row a-size-base a-color-secondary")
.find("a", "a-size-base a-link-normal") is not None:
                    author1 = container.find("div", class_="a-row a-size-base a-color-se
condary").find("a", "a-size-base a-link-normal").text.strip()
                    authors.append(author1)
                else: authors.append("-")
            except IndexError:
                authors.append('No Author')


            if container.find("span", "a-size-base a-color-secondary a-text-normal") is
not None:
                date1 = container.find("span", "a-size-base a-color-secondary a-text-nor
mal").text
                dates.append(date1)
            else: dates.append("-")

            if container.find("i", "a-icon a-icon-star-small a-star-small-4-5 aok-align-
bottom") is not None:
                star1 = float(container.find("i", "a-icon a-icon-star-small a-star-small
-4-5 aok-align-bottom").text.replace(" out of 5 stars",""))
                stars.append(star1)
            else: stars.append("-")

            if container.find("div", class_="a-row a-size-small") is not None:
                rating1 = int(container.find("div", class_="a-row a-size-small").find("s
pan", class_="a-size-base").text.replace(",",""))
                ratings.append(rating1)
            else: ratings.append("-")


            cat = soup.find_all('span', class_="a-size-base a-color-base a-text-bold")[2
].text
```

```
            categs.append(cat)
```

In [ ]:

```
#Combine the lists into a dataframe

df = pd.DataFrame({"Name":titles, "Author":authors, "User Ratings":ratings,"Review":revi
ews ,'Price':price ,  "Year":year, "Genre":genre})
```

In [ ]:

```
df.to_csv('bestseller with categories.csv')
```

DATA CLEANING

In [3]:

```
df = pd.read_csv("bestsellers with categories.csv", encoding='latin1')
df.head()
```

Out[3]:

	Name	Author	User Rating	Reviews	Price	Year	Genre
0	**10-Day Green Smoothie Cleanse**	**JJ Smith**	**4.7**	**17350**	**8**	**2016**	**Non Fiction**
1	**11/22/63: A Novel**	**Stephen King**	**4.6**	**2052**	**22**	**2011**	**Fiction**
2	**12 Rules for Life: An Antidote to Chaos**	**Jordan B. Peterson**	**4.7**	**18979**	**15**	**2018**	**Non Fiction**
3	**1984 (Signet Classics)**	**George Orwell**	**4.7**	**21424**	**6**	**2017**	**Fiction**
4	**5,000 Awesome Facts (About Everything!) (Natio...**	**National Geographic Kids**	**4.8**	**7665**	**12**	**2019**	**Non Fiction**

In [4]:

```
# Checking for null values
df.isnull().sum()
```

Out[4]:

```
Name           0
Author         0
User Rating    0
Reviews        0
Price          0
Year           0
Genre          0
dtype: int64
```

In [7]:

```
# checking for duplicates

df.duplicated().sum()
```

Out[7]:

```
0
```

DATA ANALYSIS

In [8]:

```
### to get an overview of the dataframe
df.describe()
```

Out[8]:

	User Rating User Rating	Reviews Reviews	Price Price	Year Year
count	550.000000	550.000000	550.000000	550.000000
mean	4.618364	11953.281818	13.100000	2014.000000
std	0.226980	11731.132017	10.842262	3.165156
min	3.300000	37.000000	0.000000	2009.000000
25%	4.500000	4058.000000	7.000000	2011.000000
50%	4.700000	8580.000000	11.000000	2014.000000
75%	4.800000	17253.250000	16.000000	2017.000000
max	4.900000	87841.000000	105.000000	2019.000000

In [11]:

```
# Highest rated books
highest_rated = df[df['User Rating']==4.9]
highest_rated
```

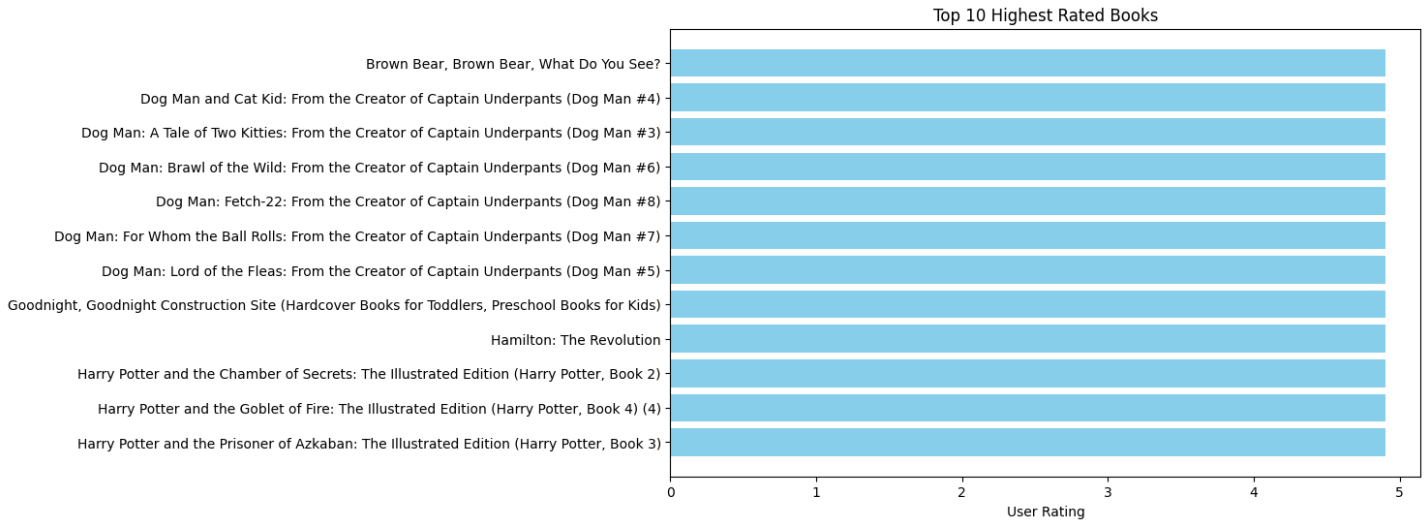
Out[11]:

	Name	Author	User Rating	Reviews	Price	Year	Genre
40	Brown Bear, Brown Bear, What Do You See?	Bill Martin Jr.	4.9	14344	5	2017	Fiction
41	Brown Bear, Brown Bear, What Do You See?	Bill Martin Jr.	4.9	14344	5	2019	Fiction
81	Dog Man and Cat Kid: From the Creator of Capta...	Dav Pilkey	4.9	5062	6	2018	Fiction
82	Dog Man: A Tale of Two Kitties: From the Creat...	Dav Pilkey	4.9	4786	8	2017	Fiction
83	Dog Man: Brawl of the Wild: From the Creator o...	Dav Pilkey	4.9	7235	4	2018	Fiction
84	Dog Man: Brawl of the Wild: From the Creator o...	Dav Pilkey	4.9	7235	4	2019	Fiction
85	Dog Man: Fetch-22: From the Creator of Captain...	Dav Pilkey	4.9	12619	8	2019	Fiction
86	Dog Man: For Whom the Ball Rolls: From the Cre...	Dav Pilkey	4.9	9089	8	2019	Fiction
87	Dog Man: Lord of the Fleas: From the Creator o...	Dav Pilkey	4.9	5470	6	2018	Fiction
146	Goodnight, Goodnight Construction Site (Hardco...	Sherri Duskey Rinker	4.9	7038	7	2012	Fiction
147	Goodnight, Goodnight Construction Site (Hardco...	Sherri Duskey Rinker	4.9	7038	7	2013	Fiction
151	Hamilton: The Revolution	Lin-Manuel Miranda	4.9	5867	54	2016	Non Fiction
153	Harry Potter and the Chamber of Secrets: The I...	J.K. Rowling	4.9	19622	30	2016	Fiction
155	Harry Potter and the Goblet of Fire: The Illus...	J. K. Rowling	4.9	7758	18	2019	Fiction
156	Harry Potter and the Prisoner of Azkaban: The ...	J.K. Rowling	4.9	3146	30	2017	Fiction
157	Harry Potter and the Sorcerer's Stone: The Ill...	J.K. Rowling	4.9	10052	22	2016	Fiction
174	Humans of New York : Stories	Brandon Stanton	4.9	2812	17	2015	Non Fiction
187	Jesus Calling: Enjoying Peace in His Presence ...	Sarah Young	4.9	19576	8	2011	Non Fiction
188	Jesus Calling: Enjoying Peace in His Presence ...	Sarah Young	4.9	19576	8	2012	Non Fiction
189	Jesus Calling: Enjoying Peace in His Presence ...	Sarah Young	4.9	19576	8	2013	Non Fiction
190	Jesus Calling: Enjoying Peace in His Presence ...	Sarah Young	4.9	19576	8	2014	Non Fiction
191	Jesus Calling: Enjoying Peace in His Presence ...	Sarah Young	4.9	19576	8	2015	Non Fiction
192	Jesus Calling: Enjoying Peace in His Presence ...	Sarah Young	4.9	19576	8	2016	Non Fiction
207	Last Week Tonight with John Oliver Presents A ...	Jill Twiss	4.9	11881	13	2018	Fiction
219	Little Blue Truck	Alice Schertle	4.9	1884	0	2014	Fiction
244	Obama: An Intimate Portrait	Pete Souza	4.9	3192	22	2017	Non Fiction
245	Oh, the Places You'll Go!	Dr. Seuss	4.9	21834	8	2012	Fiction
246	Oh, the Places You'll Go!	Dr. Seuss	4.9	21834	8	2013	Fiction

	Name	Author	User Rating	Reviews	Price	Year	Genre
247	Oh, the Places You'll Go!	Dr. Seuss	4.9	21834	8	2014	Fiction
248	Oh, the Places You'll Go!	Dr. Seuss	4.9	21834	8	2015	Fiction
249	Oh, the Places You'll Go!	Dr. Seuss	4.9	21834	8	2016	Fiction
250	Oh, the Places You'll Go!	Dr. Seuss	4.9	21834	8	2017	Fiction
251	Oh, the Places You'll Go!	Dr. Seuss	4.9	21834	8	2018	Fiction
252	Oh, the Places You'll Go!	Dr. Seuss	4.9	21834	8	2019	Fiction
288	Rush Revere and the Brave Pilgrims: Time-Trave...	Rush Limbaugh	4.9	7150	12	2013	Fiction
289	Rush Revere and the First Patriots: Time-Trave...	Rush Limbaugh	4.9	3836	12	2014	Fiction
303	Strange Planet (Strange Planet Series)	Nathan W. Pyle	4.9	9382	6	2019	Fiction
420	The Legend of Zelda: Hyrule Historia	Patrick Thorpe	4.9	5396	20	2013	Fiction
431	The Magnolia Story	Chip Gaines	4.9	7861	5	2016	Non Fiction
476	The Very Hungry Caterpillar	Eric Carle	4.9	19546	5	2013	Fiction
477	The Very Hungry Caterpillar	Eric Carle	4.9	19546	5	2014	Fiction
478	The Very Hungry Caterpillar	Eric Carle	4.9	19546	5	2015	Fiction
479	The Very Hungry Caterpillar	Eric Carle	4.9	19546	5	2016	Fiction
480	The Very Hungry Caterpillar	Eric Carle	4.9	19546	5	2017	Fiction
481	The Very Hungry Caterpillar	Eric Carle	4.9	19546	5	2018	Fiction
482	The Very Hungry Caterpillar	Eric Carle	4.9	19546	5	2019	Fiction
486	The Wonderful Things You Will Be	Emily Winfield Martin	4.9	8842	10	2016	Fiction
487	The Wonderful Things You Will Be	Emily Winfield Martin	4.9	8842	10	2017	Fiction
488	The Wonderful Things You Will Be	Emily Winfield Martin	4.9	8842	10	2018	Fiction
489	The Wonderful Things You Will Be	Emily Winfield Martin	4.9	8842	10	2019	Fiction
521	Unfreedom of the Press	Mark R. Levin	4.9	5956	11	2019	Non Fiction
545	Wrecking Ball (Diary of a Wimpy Kid Book 14)	Jeff Kinney	4.9	9413	8	2019	Fiction

In [36]:

```
# Plotting
plt.figure(figsize=(10, 6))
plt.barh(highest_rated['Name'].head(15), highest_rated['User Rating'].head(15), color='sk
yblue')
plt.xlabel('User Rating')
plt.title('Top 10 Highest Rated Books')
plt.gca().invert_yaxis()  # Invert y-axis to have the highest rated book at the top
plt.show()
```



In [22]:

```
# Most reviewed book
```

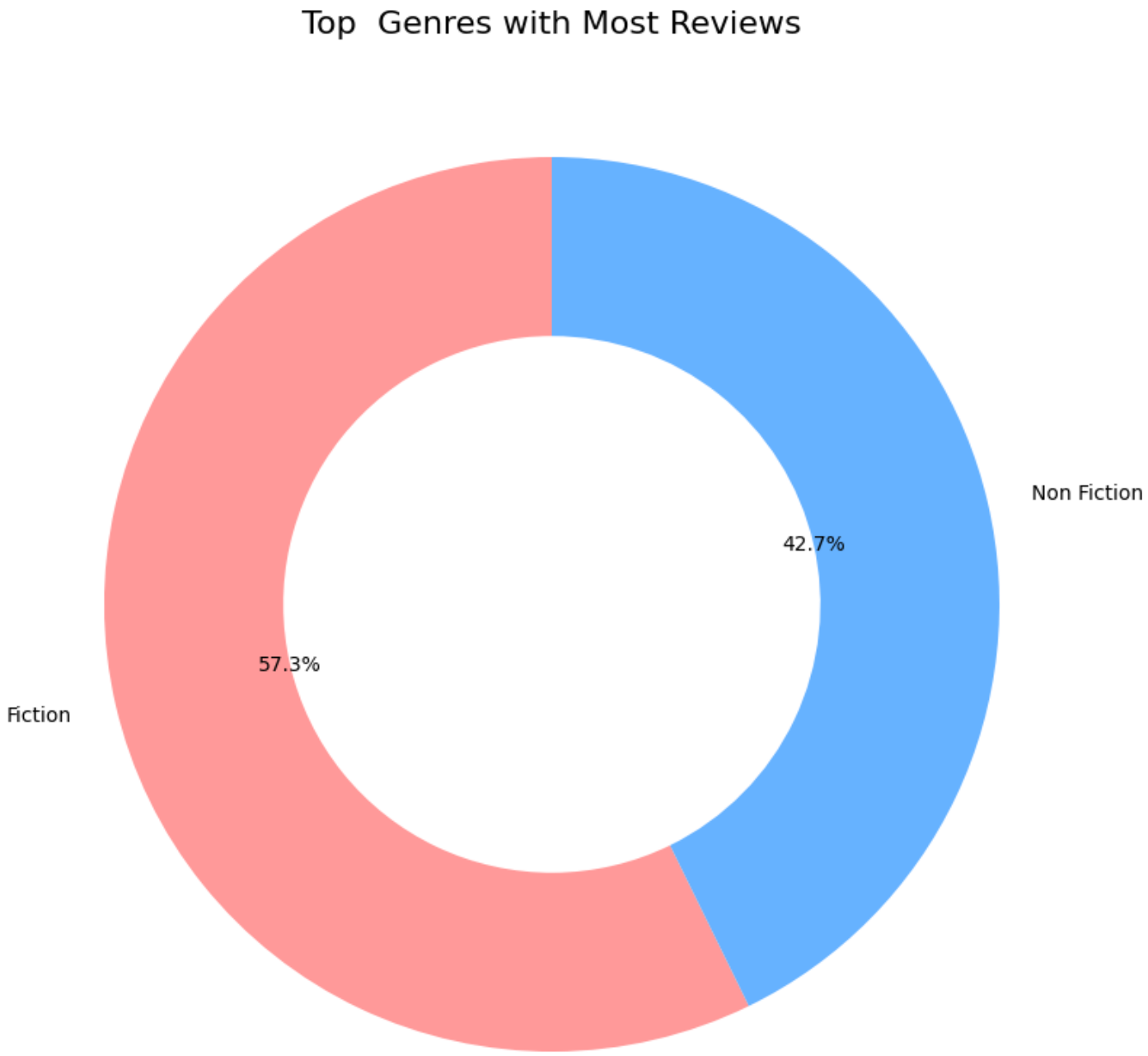
```
most_review = df.sort_values('Reviews', ascending = False).iloc[:20].Name.unique()
most_review
```

Out[22]:

```
array(['Where the Crawdads Sing', 'The Girl on the Train', 'Becoming',
       'Gone Girl', 'The Fault in Our Stars', 'The Nightingale: A Novel',
       'Fifty Shades of Grey: Book One of the Fifty Shades Trilogy (Fifty Shades of Grey
Series)',
       'The Martian', 'All the Light We Cannot See', 'The Alchemist'],
      dtype=object)
```

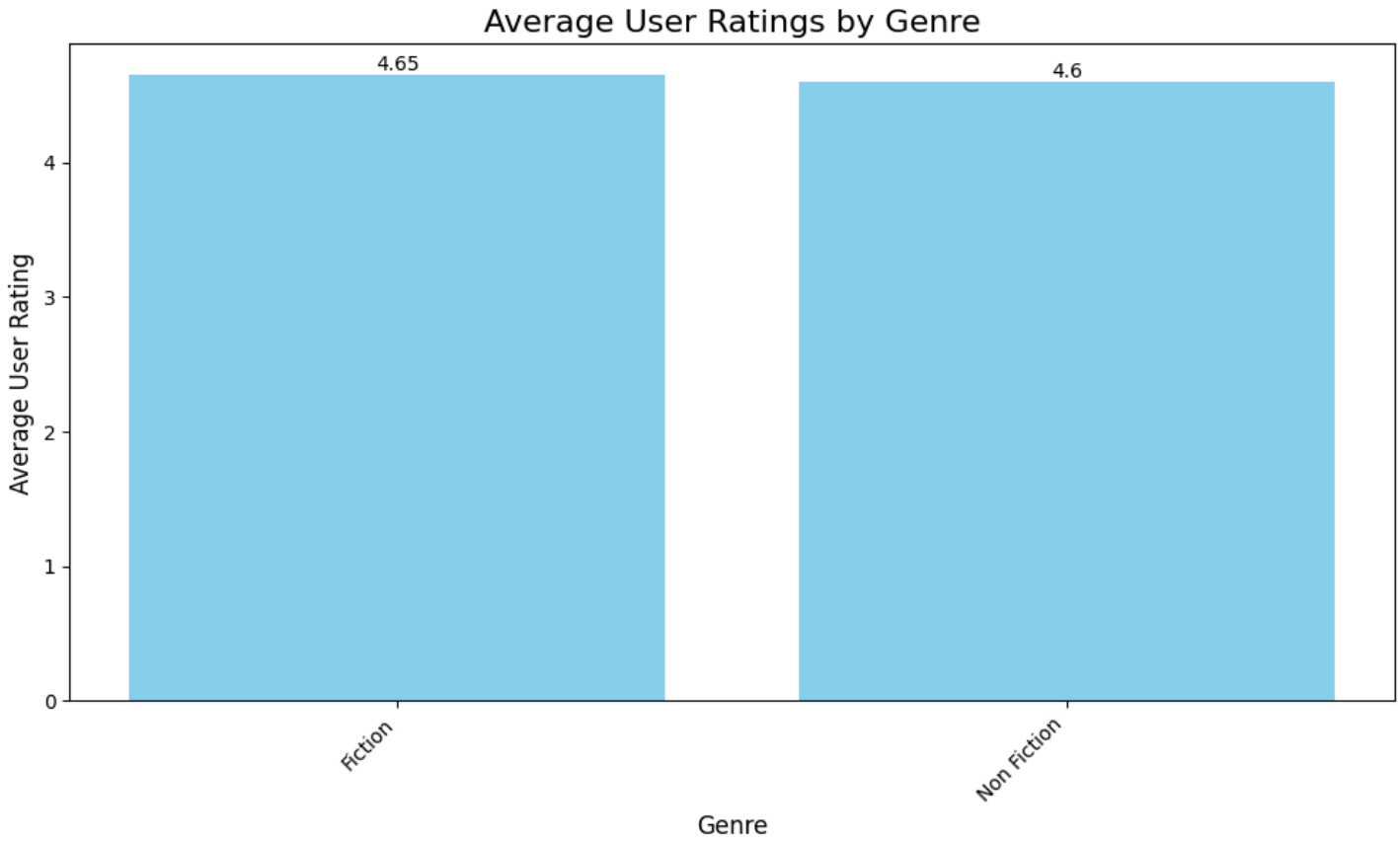
In [31]:

```
#categories with most reviews
most_review = df.groupby('Genre')['Reviews'].sum().to_frame().reset_index().sort_values(
'Reviews', ascending = False).iloc[:50]


# Custom color palette for a more attractive visualization
colors = ['#FF9999', '#66B2FF', '#99FF99', '#FFCC99', '#c2c2f0', '#ffb3e6', '#c2f0c2', '
#ff6666', '#c2f0f0', '#ffdb4d']

# Plotting as a donut chart
plt.figure(figsize=(10, 10))
plt.pie(most_review['Reviews'], labels=most_review['Genre'], autopct='%1.1f%%', startang
le=90, colors=colors, wedgeprops=dict(width=0.4))
plt.title('Top  Genres with Most Reviews', fontsize=16)
plt.show()
```



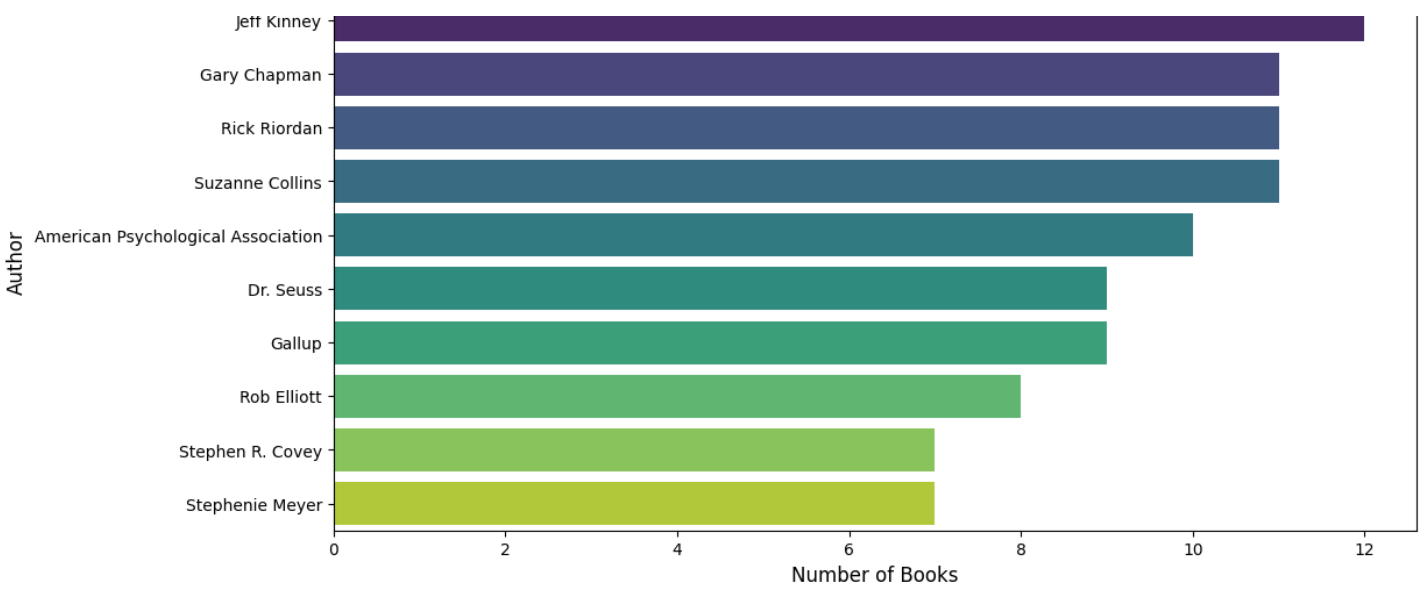
In [33]:

```
# Group by 'Genre' and calculate the mean of 'User Rating' for each category
average_ratings_by_genre = df.groupby('Genre')['User Rating'].mean().to_frame().reset_in
dex().sort_values('User Rating', ascending=False).reset_index(drop=True)

# Plotting as a bar plot with data labels
plt.figure(figsize=(12, 6))
bars = plt.bar(average_ratings_by_genre['Genre'], average_ratings_by_genre['User Rating']
, color='skyblue')
plt.xlabel('Genre', fontsize=12)
plt.ylabel('Average User Rating', fontsize=12)
plt.title('Average User Ratings by Genre', fontsize=16)
plt.xticks(rotation=45, ha='right')  # Rotate x-axis labels for better readability

# Add data labels to the bars
for bar in bars:
    yval = bar.get_height()
    plt.text(bar.get_x() + bar.get_width()/2, yval, round(yval, 2), ha='center', va='bot
tom', fontsize=10)

plt.show()
```



In [34]:

```
# Top 10 authors by book count
top_authors = df['Author'].value_counts().head(10)

# Plotting as a horizontal bar plot
plt.figure(figsize=(12, 6))
sns.barplot(x=top_authors.values, y=top_authors.index, palette='viridis')
plt.xlabel('Number of Books', fontsize=12)
plt.ylabel('Author', fontsize=12)
plt.title('Top 10 Authors by Book Count', fontsize=16)
plt.show()
```



Conclusion

- ***Trends in Popular Literature***: **A detailed examination of sales data reveals a sustained preference for illustrated and children's literature, as exemplified by the "Dog Man" and "Harry Potter" series. This trend is reflective of the power of strong visual storytelling in capturing the imagination of young readers.**
- ***Engagement and Brand Loyalty***: **The high user ratings and engagement for these series indicate not just a passing interest but a deep-seated brand loyalty and satisfaction among consumers, which speaks volumes about the quality and impact of these works.**
- ***The Fiction Phenomenon***: **The preponderance of fiction in user reviews and ratings underscores the genre's ability to connect with readers on a personal level, often serving as a form of escapism or a means to experience new adventures.**
- ***Educational and Self-Help Literature***: **Notable interest in non-fiction, particularly from educational publishers like the American Psychological Association, reveals a dedicated market segment for academic and self-help literature, hinting at the diverse needs of Amazon's consumer base.**

RECOMENDATIONS

- ***Stock Optimization***: **Enhance inventory with bestsellers, focusing on children's and illustrated books, which show a proven track record of high sales and engagement.**
- ***Marketing Focus***: **Intensify marketing efforts for fiction genres, capitalizing on their established review counts and user ratings to increase visibility and sales.**
- ***Diversify Offerings***: **Broaden the non-fiction selection, catering to a more diverse audience and addressing the substantial interest in this area.**
- ***Author Collaborations***: **Forge partnerships with beloved authors to offer exclusive releases or special editions, thereby driving sales and creating buzz.**
- ***Promotional Strategies***: **Craft promotions specifically around well-performing children's series, aiming to optimize sales during key buying seasons such as holidays and back-to-school periods.**
- ***Review-Driven Marketing***: **Leverage the active engagement found in fiction reviews to build community-centric marketing campaigns, encouraging further reviews and word-of-mouth recommendations.**
- ***Expand Educational Content***: **Explore opportunities to work with academic publishers to increase the range of educational materials, meeting the demand for quality self-help and academic literature.**
- ***Author Events***: **Plan and execute both virtual and in-person events with top authors to enhance reader engagement, loyalty, and to drive book sales through these interactive experiences.**