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RESEARCH LABS

INNOVATION. AUTOMATION. ANALYTICS

PROJECT ON

Books to Scrape: Web Scraping and Exploratory Data Analysis Using Python

Presented By :- Pradnya Vikas Shinde

About me

- **Name :- Pradnya Vikas Shinde**
- **Education** :- Bharti Vidyapeeth deemed University, Pune.
- **Why I Want To Learn Data Analyst** :-
  I enjoy understanding patterns behind data and explaining them clearly, which is why Data Analytics perfectly matches my problem-solving and presentation skills

  Connect With Me :-

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  GitHub - https://github.com/pradnya2506

Business Objectives

- To **collect structured book data such as price, rating, and availability** from(Datset ss?) an online source using automated web scraping.
- To **analyze pricing and rating patterns** to understand customer preferences and market trends.
- To identify popular and **highly rated books** that can support better inventory and recommendation decisions.
- To transform **raw web data into actionable insights** through exploratory data analysis (EDA).
- To demonstrate an **end-to-end data analytics** workflow from data extraction to business-ready insights.

Web-Scrapping : Details

- Data was collected from the **Book To Scrap website.(**
- Books information was extracted using **web scraping.**
- The dataset represents real-time, publicly available online book listings collected from the *Books to Scrape* website.
- Scraped attributes include:
  - Title
  - Price
  - Ratings
  - Availability
  - Category
  - Stock
  - Url

Data Summary

Database Schema

- **Data Source:** *Books to Scrape* website (web scraped)
- **Data Format:** Structured tabular data (CSV/DataFrame)

Total Records	**400 Books**
Total Features	**8-9 (Columns)**
Categories Covered	**50+**
Rating Levels	**5 (One to Five Star)**
Price Range	**£10-£60**

Data Quality & Readiness

- Minor missing values due to web scraping
- Duplicate records identified and removed
- Data cleaned, standardized, and prepared for EDA

Data Cleaning

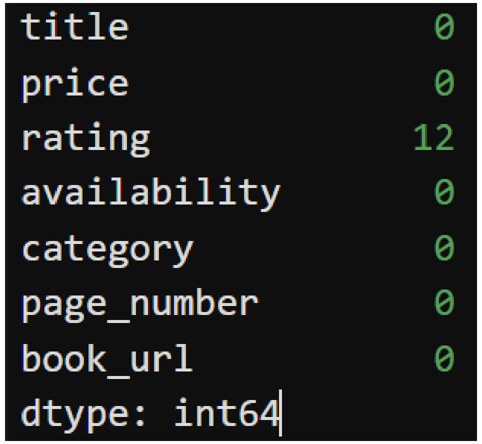
Missing Value Handling

- Identified missing values in **price, rating, and availability** columns
- Handled missing records using **removal and logical imputation techniques**
- Missing values occurred due to **incomplete HTML tags during web scraping**

Data Type Standardisation

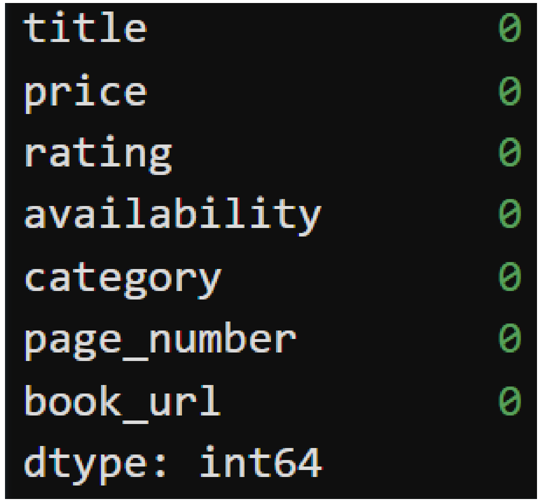
- Converted **price** from text to numeric format
- Transformed **rating** from text labels (e.g., “Three”) to numeric values
- Removed **currency symbols (£)** and unnecessary characters

Missing Values

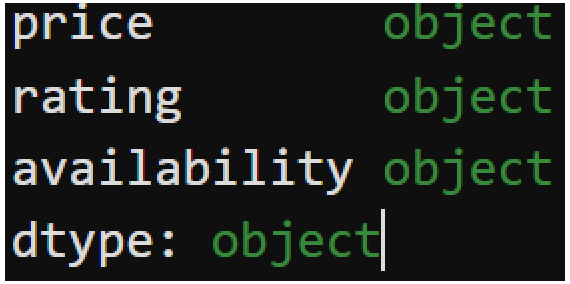


```
title           0
price           0
rating         12
availability    0
category        0
page_number     0
book_url        0
dtype: int64
```

After handling missing values

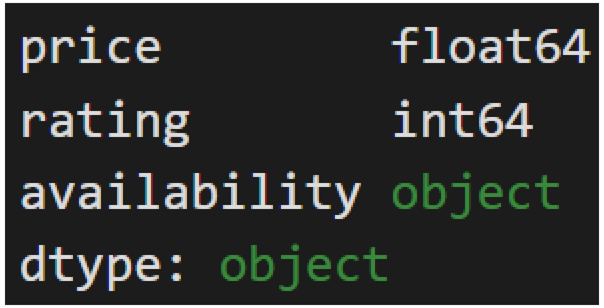


```
title           0
price           0
rating          0
availability    0
category        0
page_number     0
book_url        0
dtype: int64
```



```
price           object
rating          object
availability    object
dtype: object
```

Before Converting data types



```
price           float64
rating            int64
availability     object
dtype: object
```

After Converting data types

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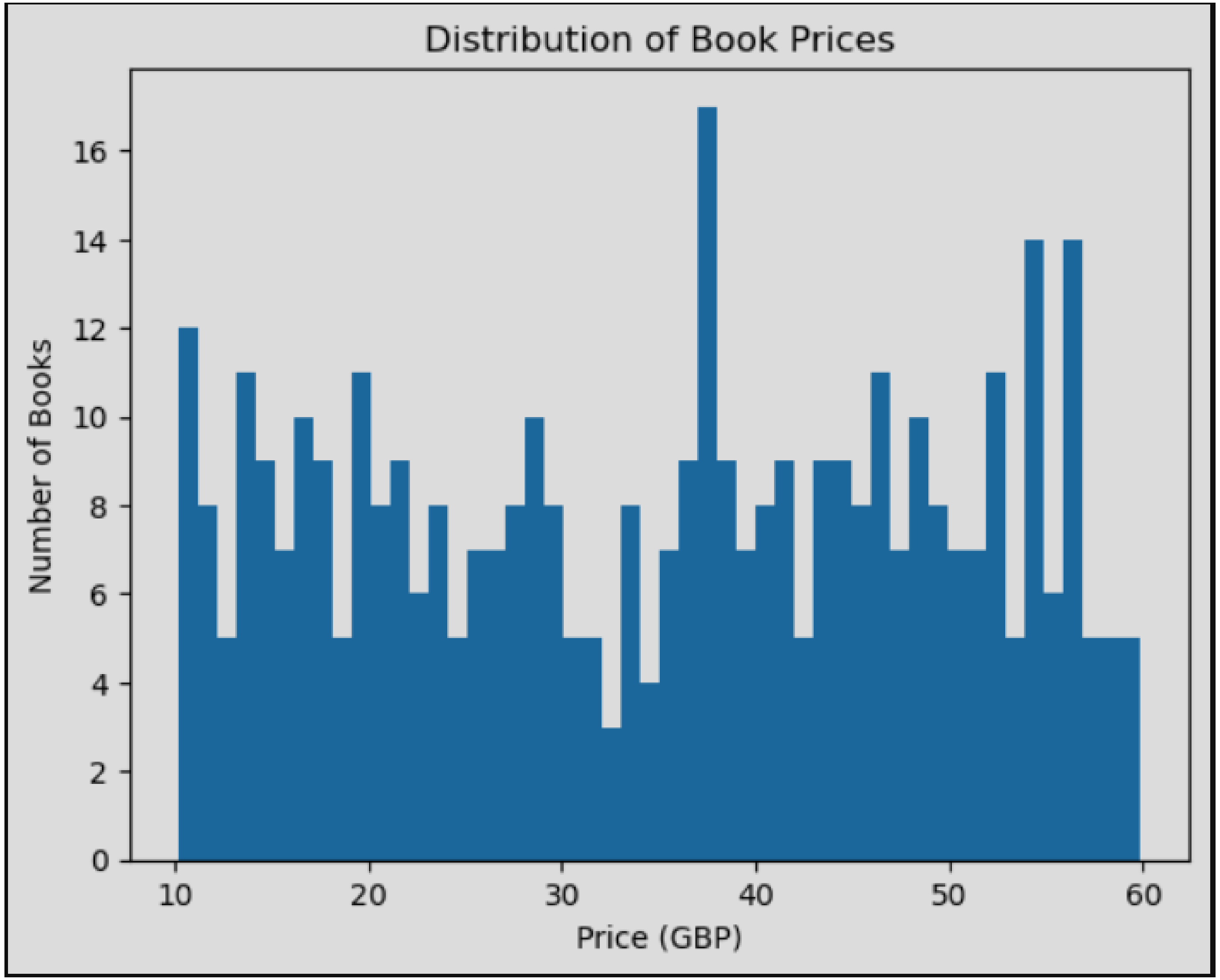
Distribution of Book Prices



Insights :-

- The highest concentration of books lies in the **£20–£40 price range**
- This shows that **most books are moderately priced**
- Very few books fall in the extremely low or high price ranges
- This graph shows the distribution of book prices.
  Most books fall in the mid-price range, which indicates a focus on affordable pricing

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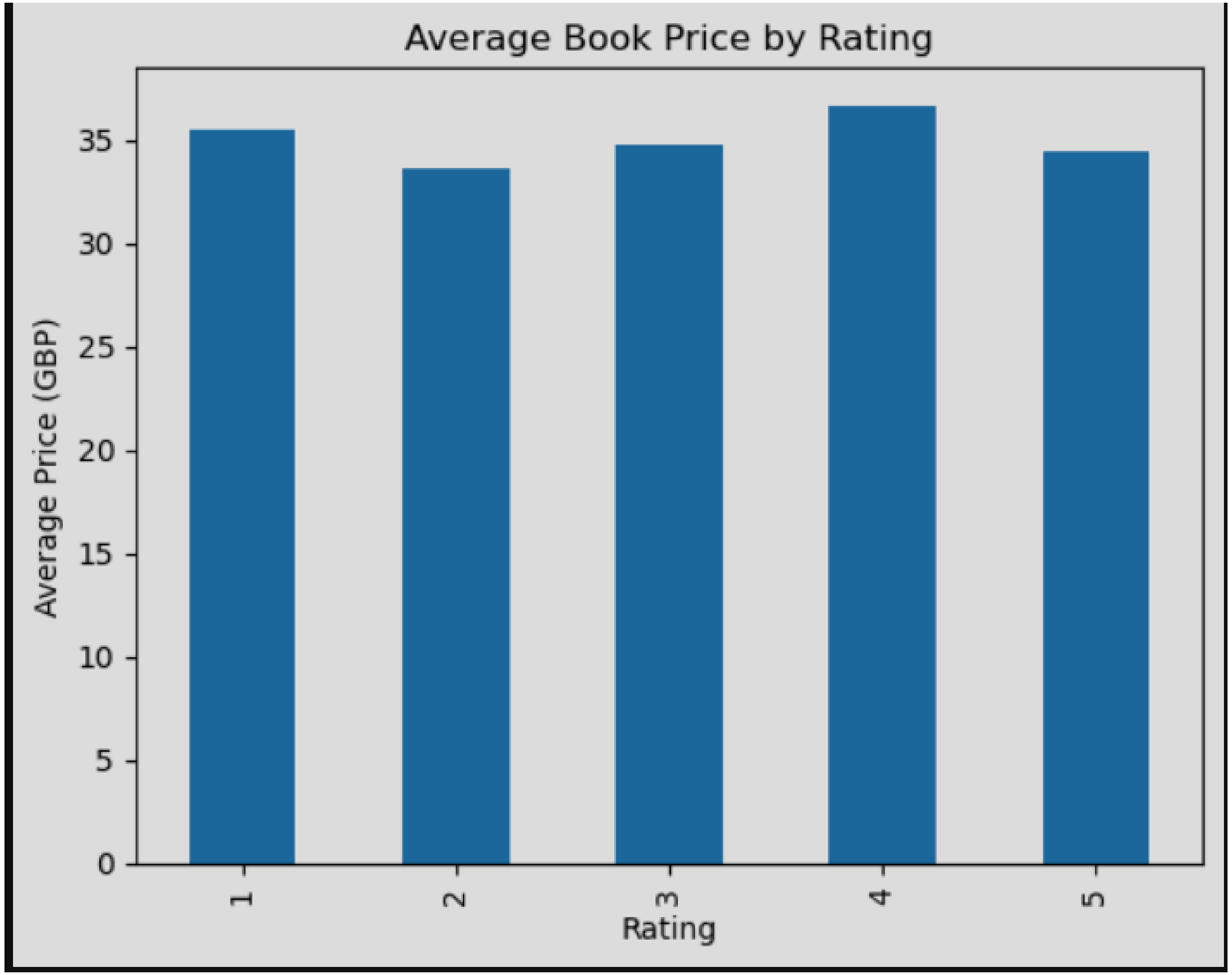
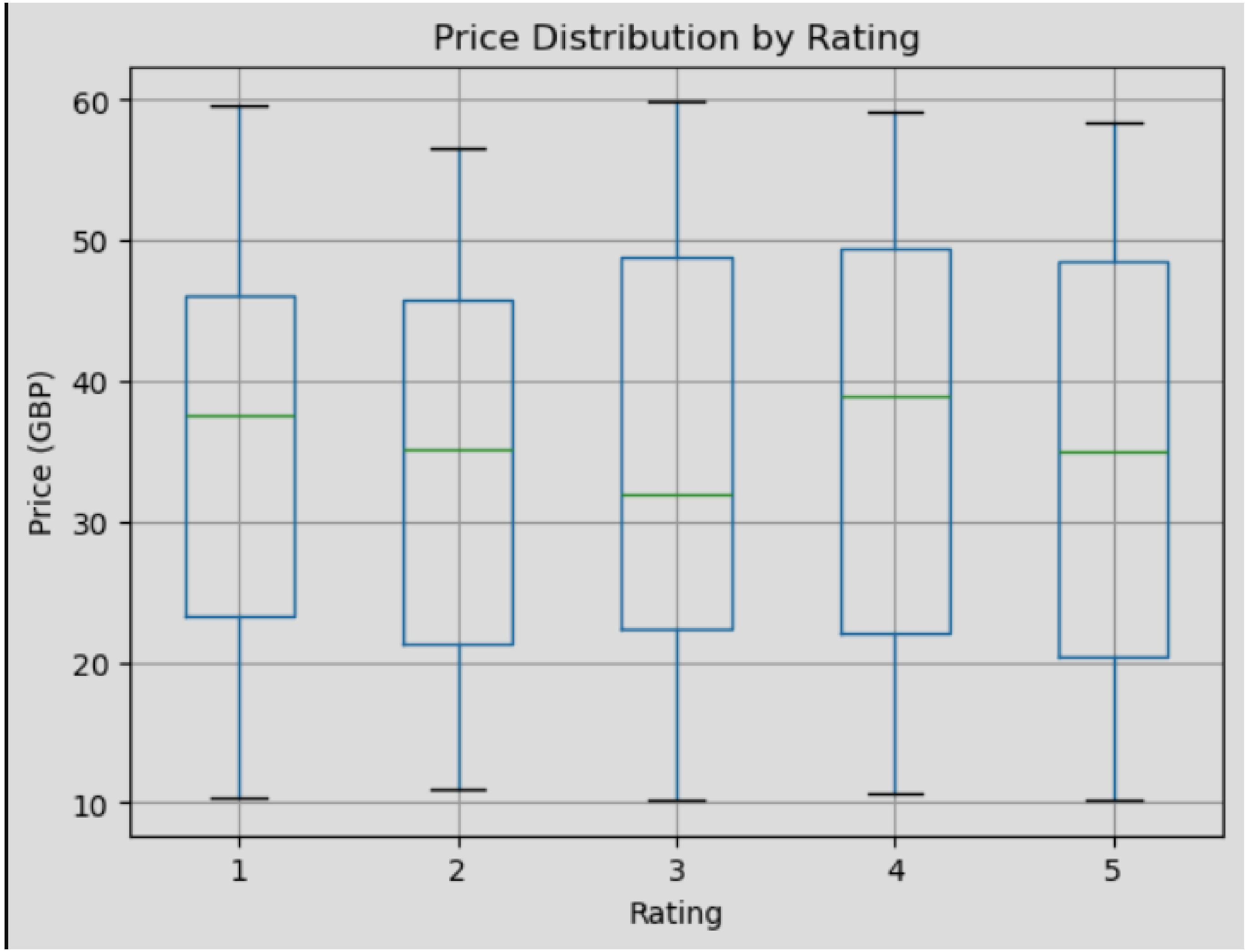
Average Book Price by Rating



Insights :-

- Higher-rated books (4★) tend to have slightly higher average prices.
- Price differences across ratings are small, showing pricing is fairly consistent.

Price Distribution by Rating



Insights :-

- **Higher-rated books (4★) show a higher median price** compared to lower ratings.

- **Price ranges overlap across all ratings**, indicating rating is not the only factor influencing price.

- This analysis compares prices across ratings.
  Higher-rated books tend to have slightly higher prices, but overall, price differences are small.
  This suggests that ratings alone do not strongly influence book prices

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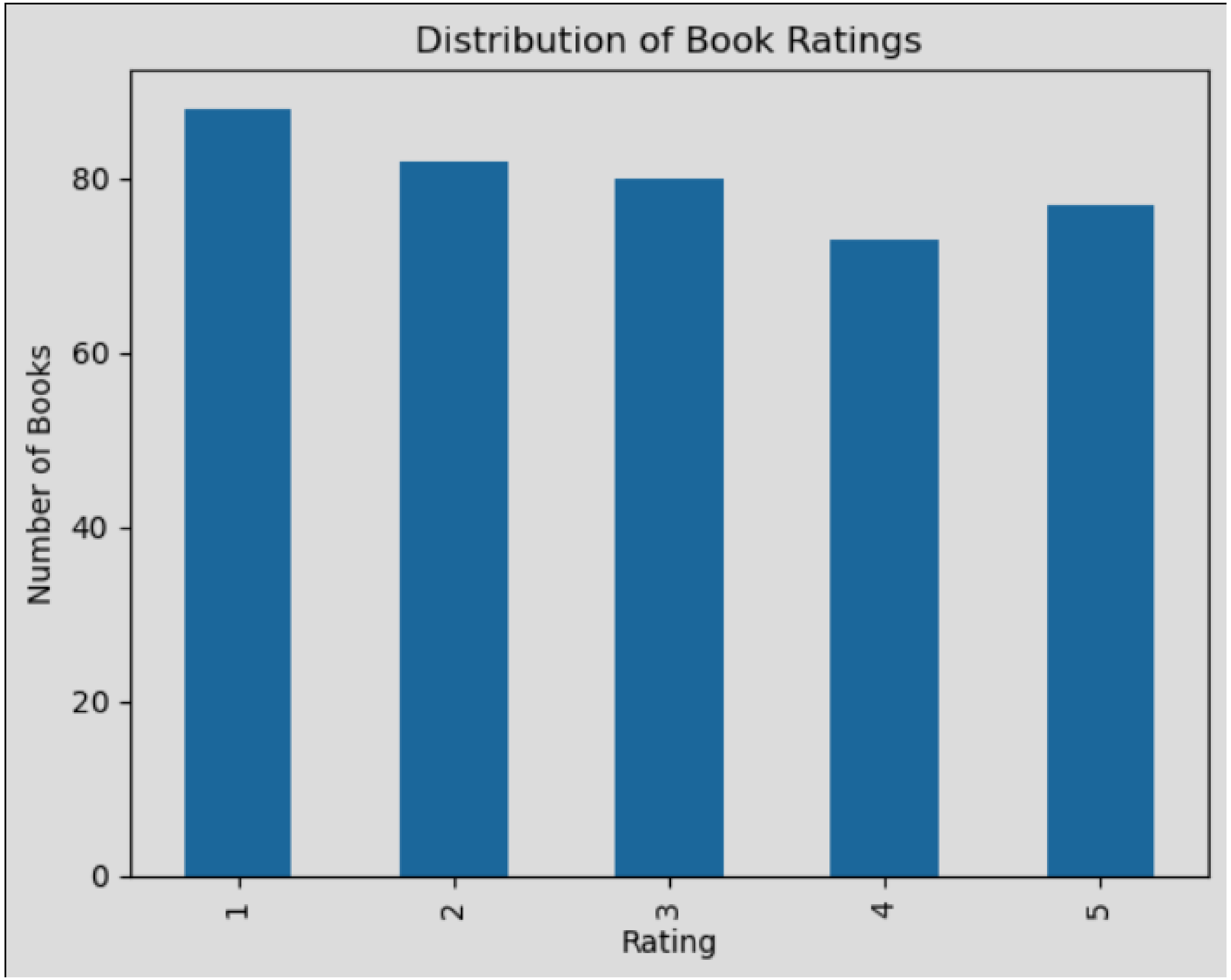
Distribution of Book Ratings



Insights :-

- **Lower ratings (1★–2★) appear more frequently** than higher ratings.
- **Ratings are fairly evenly spread overall**, indicating diverse reader opinions across books.
- Here we can see how ratings are distributed.
  Ratings are fairly spread, showing diverse reader opinions

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Challenges

- **Dynamic and inconsistent HTML structure(attached ss for before data)** across pages made element selection difficult
- **Missing or incomplete data** due to unavailable tags during scraping
- **Text-based values** (prices, ratings) required additional cleaning and conversion.
- **Pagination handling** was needed to extract data from multiple pages
- **Ensuring data quality** while removing duplicates and invalid records

Conclusions and Recommendations

Conclusions :-

- Web scraping successfully extracted **structured book data** from the *Books to Scrape* website.
- The dataset revealed **balanced pricing** with most books in the mid-price range.
- **Ratings and prices show a weak relationship**, indicating price is not solely driven by ratings.

The cleaned dataset was **analysis-ready** and suitable for meaningful EDA.

Recommendations :-

- Focus on **mid-priced books**, as they represent the majority of listings.
- Use **ratings along with other factors** (category, popularity) for better recommendations.
- Automate periodic scraping to **track price and rating trends over time**.
- Extend analysis by including **category-wise and sentiment analysis**.

THANK YOU