# Abstract

## Project Title:

Spending Patterns Analysis Using Transactional Data and External Benchmarks

## Project Objective:

The main objective of this project is to explore, analyze, and visualize consumer spending behavior using a detailed transaction dataset. Additionally, we compare the results to external benchmarks from global household expenditure data.

## Data Source:

- The primary dataset `spending\_patterns\_detailed.csv` was downloaded from Kaggle and contains:

- Transaction ID, Customer ID  
 - Date of transaction  
 - Item, Category, Quantity  
 - Price per unit, Total spent  
 - Payment method, Location

- External dataset:

- Wikipedia: Household Final Consumption Expenditure per Capita  
 Retrieved from: https://en.wikipedia.org/wiki/List\_of\_countries\_by\_household\_final\_consumption\_expenditure\_per\_capita

## Project Steps:

1. Data Wrangling:

- Cleaned and converted the date column into datetime format.  
- Extracted Year, Month, and Weekday from each transaction.  
- Identified and encoded categorical and numerical variables.  
- Handled missing values and ensured data types are consistent.

2. Visualizations (Plotly):

- Interactive charts showing:  
 - Transactions by category  
 - Total spending by category, month, weekday  
 - Top 10 items by total spending  
- All charts were converted from Matplotlib/Seaborn to Plotly for interactivity.

3. Web Scraping:

- Used BeautifulSoup and pandas to scrape global expenditure data from Wikipedia.  
- Cleaned and converted monetary values to numeric format for comparison.

4. External Data Merging:

- Added a constant country column: 'United States'  
- Merged local spending data with global per-capita expenditure benchmarks.

5. Project Organization:

- Structured using Cookiecutter Data Science template.  
- Code organized into notebooks/, data into data/, outputs into output/, and charts into visualizations/.

## Tools & Libraries Used:

- Python: pandas, numpy, plotly, matplotlib, seaborn, BeautifulSoup  
- Jupyter Notebook for exploration and development  
- Cookiecutter for project structuring