

**MGT 301**  
**Research Tools and Techniques**



**Semester Project: Report on a Research Personal Finance**

**Name:**

*Addan Shahwaiz.*

*Mohib Imran.*

**Roll Number:**

*Sp23-BBD-006.*

*Sp23-BBD-035.*

**Submitted to:**

*Mam Sabra Nadeem.*

**Due date:**

*24<sup>th</sup> December, 2024.*

## Research on Personal Finance

1. Abstract	3
2. Introduction	3
○ 3.1 Background Information	3
○ 3.2 Research Objectives	3
○ 3.3 Research Questions	3
○ 3.4 Future Course of Action	4
○ 3.5 Variables Used in Research	4
○ The relationships between variables	4
○ Relation of these variables with management theories	5
3. Literature Review	
○ 4.1 Financial Behavior of University Students	5
○ 4.2 Impact of Demographics on Financial Behavior	5
○ 4.3 Budgeting	5
○ 4.4 Saving Challenges	5
○ 4.5 Financial Confidence	5
○ Theoretical Framework	6
○ Hypothesis Formulation	6
4. Methodology	
○ 5.1 Research Design	7
○ 5.2 Research Type	7
○ 5.3 Data Collection	7
○ 5.4 Sampling Process	7
○ 5.5 Data Collection Types	7
○ 5.6 Data Analysis Techniques	7
○	

## 5. Results

○ 6.1 Demographics	8
▪ 6.1.1 Age Group	8
▪ 6.1.2 Gender	8
▪ 6.1.3 Living Status	8
▪ 6.1.4 Pocket Money Range	8
○ 6.2 Descriptive Statistics	
▪ 6.2.1 Mean	9
▪ 6.2.2 Median	9
▪ 6.2.3 Mode	10
○ 6.3 Multi-Validate Analysis	
▪ 6.3.1 Correlation Analysis	10
▪ 6.3.2 Boxplot Analysis	11
○ 6.4 Correlation Matrix	12
○ 6.5 Justification of Findings	
▪ 6.5.1 Strong Positive Correlation	12
▪ 6.5.2 Strong Negative Correlation	13
6. Errors in the Model	
○ 7.1 Mean Absolute Error	13
○ 7.2 Mean Squared Error	13
○ 7.3 R-squared Score	13
7. NLP For Suggestions Column	14
8. References	17

## Research on Personal Finance

### Abstract:

This report focuses on analyzing the **financial behavior** of young adults through a **survey** conducted with **121 respondents**. The key aspects explored in the survey include **pocket money management, spending habits, financial sufficiency, and confidence in managing finances**. By analyzing variables such as **spendings on public transport, gasoline costs, mobile service bills, budgeting practices, and savings habits**, the report aims to assess the ability of individuals to manage their finances effectively. The primary goal of the study is to **predict how these factors influence confidence in managing finances** using **statistical and machine learning models**.

The report utilizes a **linear regression model** to analyze the relationship between **independent variables** (such as spending habits and financial behaviors) and the **dependent variable (confidence in managing finances)**. The model's performance is evaluated using key metrics like **Mean Absolute Error (0.464), Mean Squared Error (0.347)**, and a **R<sup>2</sup> score of 0.71**, indicating a **strong predictive power**.

---

### Introduction:

The dataset examines the financial habits of **university students**, focusing on their ability to manage pocket money and make informed financial decisions. It includes 121 responses, with data on “age, semester, gender, living status, pocket money range, and various spending categories like public transport, gasoline, rent, and mobile bills. It also covers aspects such as budgeting, spending tracking, and confidence in managing finances, offering insights into the financial behavior and challenges faced by young adults”.

#### ➤ Research Objectives:

The research objectives of this study are:

- To analyze the **financial behavior** of university students, focusing on their pocket money management, budgeting habits, and expenditure patterns.
- To assess the **relationship** between **personal demographics** (age, semester, gender, living status) and financial management skills.
- To determine the factors contributing to financial confidence and the challenges students face in saving money.
- To evaluate the **effectiveness** of **budgeting** and spending tracking on students' financial stability.
- To identify the major **financial challenges** faced by students and the strategies they use to manage shortfalls.

#### ➤ Research Questions:

- How much do you spend on Public Transport and Gasoline?
- Do you budget your Pocket Money?
- Do you track your spending?
- How often do you run out of money before the end of the month?
- If you run out of money, how do you manage the shortfall?

- What is the biggest challenge you face while saving?
- Do you save a portion of your Pocket Money?
- What percentage of your Pocket Money do you save?
- Are you confident in managing your finances?

➤ **Future Course of Action:**

The future course of action for this research involves several key steps to enhance the analysis and improve the results. First, expanding data collection by **gathering more responses** would strengthen the dataset and make the conclusions more representative. Additionally, refining the data processing methods will help address any inconsistencies or missing values, ensuring accuracy.

**Advanced statistical analysis** should be conducted, focusing on correlation analysis between demographics and financial behavior. Segmentation of students based on their financial practices could also provide deeper insights into different groups' challenges and habits.

Refining the **predictive model** with different techniques like **Random Forest** or **Decision Trees** could improve its accuracy. Incorporating new features, such as external financial pressures or part-time income, will also enhance the model's performance.

Finally, **expanding the survey** with more questions on financial literacy and extracurricular income sources would allow for a broader understanding of student finances. Longitudinal studies and follow-up surveys can track changes in financial behavior over time, offering insight into the effectiveness of any interventions.

➤ **Variables used in Research →**

- **Dependent Variable:** Spending Pocket Money.
- **Independent Variable:** Pocket money.
- **Moderator:** Living Status.
- **Mediator:** Budgeting Pocket Money.

➤ **The relationships between these variables are as follows:**

1. **Pocket Money (Independent Variable) → Spending Pocket Money:**

Pocket money directly affects spending behavior, with higher or lower amounts influencing how students allocate resources.

2. **Living Status impacts → Pocket Money → Spending Pocket Money:**

Living status moderates this relationship, as students living independently may spend more on essentials compared to those living with family.

### 3. **Pocket Money → Budgeting Pocket Money (Mediator) → Spending Pocket Money:**

Budgeting mediates the relationship, with effective budgeting leading to more controlled spending, regardless of the amount of pocket money received.

### 4. **Living Status → Budgeting Pocket Money → Spending Pocket Money:**

Living status indirectly affects spending by shaping budgeting practices, which in turn influence spending habits.

### ➤ **Relation of these variables with management theories:**

Yes, there is a relationship between these variables can be linked to management theory, particularly those addressing behavior, decision-making, and resource allocation:

- **Maslow's Hierarchy of Needs:**

Living status and pocket money can relate to the fulfillment of basic needs. Students with independent living status may prioritize essential spending (food, shelter), aligning with the theory's focus on satisfying lower-tier needs before higher-level aspirations.

- **Herzberg's Two-Factor Theory:**

Financial challenges (hygiene factors) such as insufficient pocket money or high expenses can lead to dissatisfaction, while successful budgeting and spending control (motivators) enhance financial stability and confidence.

For meeting all these requirements, we will go through **Quantitative Research Analysis.**

---

## **Literature Review:**

- **Financial Behavior of University Students**

Financial literacy helps students manage limited resources, reducing stress and improving academic performance (Lusardi & Mitchell, 2014; Shim et al., 2009).

- **Impact of Demographics**

Age, gender, and living status shape financial habits, with independent students facing higher financial pressures (Xiao et al., 2007; Hira & Mugenda, 2000).

- **Budgeting**

Financial Education impulsive spending and ensures stability, though poor habits arise without financial education (Zimmerman & Katon, 2005).

- **Saving Challenges**

Limited money and emergencies force students to borrow, straining stability (Loibl et al., 2011).

- **Financial Confidence**

Active budgeting boosts confidence and control (Perry & Morris, 2005).

➤ **Theoretical Framework:**

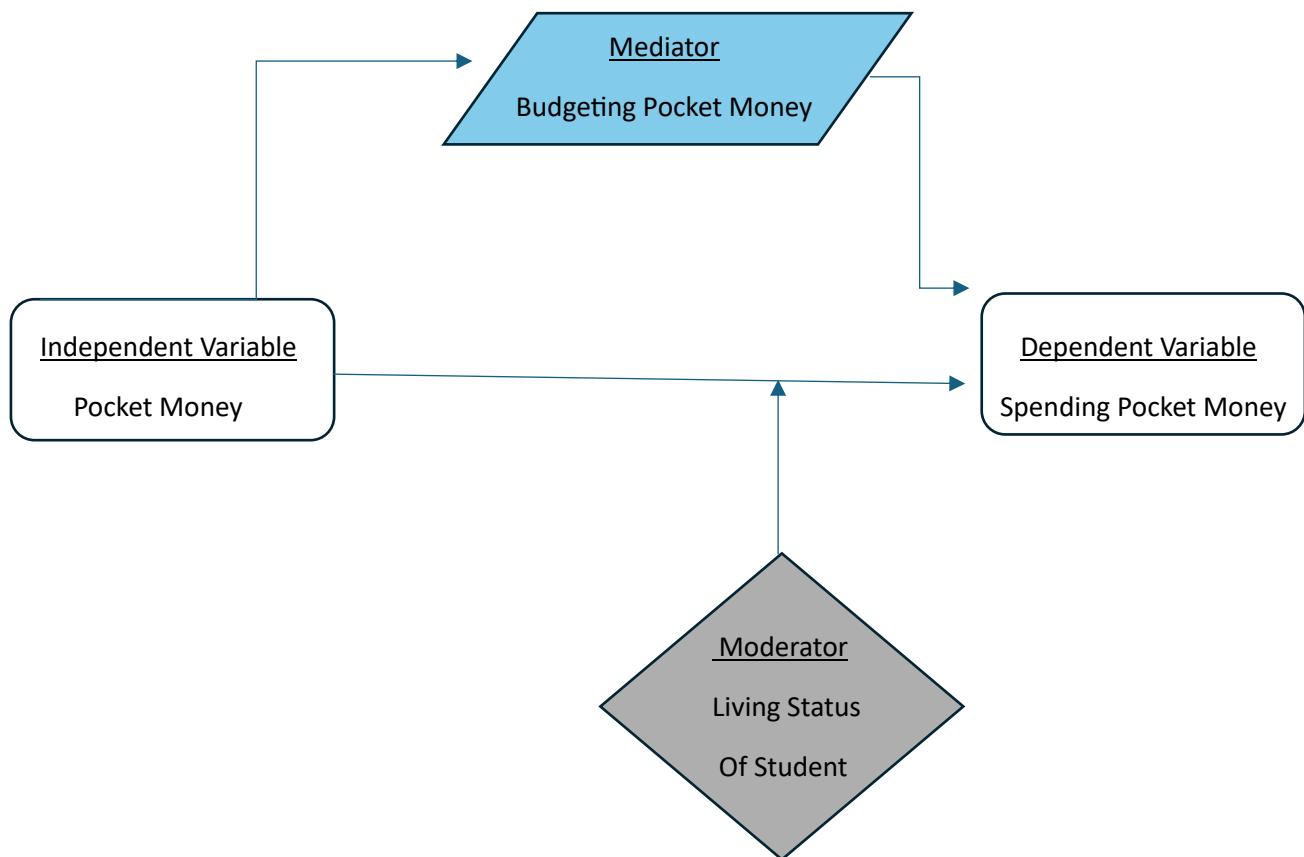


Figure 1.1

➤ **Hypothesis using theoretical framework:**

- **H1:**

*The more pocket money students receive, the more they spend.*

- **H2:**  
*Students who live independently spend more of their pocket money compared to those living with family or in hostels.*
- **H3:**  
*Students who budget their pocket money spend it more carefully, regardless of how much money they have.*
- **H4:**  
*The way students live (independently or with family) affects how budgeting influences their spending of pocket money.*

## **Methodology:**

### ➤ **Research Design**

The research design will follow a **quantitative approach**, utilizing statistical tools to analyze the relationship between financial behaviors and demographic factors among university students. A survey will be conducted to gather numerical data related to pocket money management, budgeting habits, and expenditure patterns.

### ➤ **Research Type**

This study will employ a **descriptive research** type to explore the financial behavior of **university students**. Additionally, it will incorporate correlational analysis to examine the relationships between various independent and dependent variables such as age, gender, and living status.

### ➤ **Data Collection**

Data will be collected through a **structured questionnaire**. The survey will focus on university students' financial management behaviors, spending habits, and budgeting practices.

### ➤ **Sampling Process**

The sampling technique used will be **stratified random sampling**. This approach ensures that all subgroups of the population (e.g., students from different faculties, age groups, or living arrangements) are properly represented in the sample. The sample size will be 121 university students.

### ➤ **Data Collection Types**

The data will be collected **cross-sectionally**, meaning all the data will be gathered at a single point in time to provide a snapshot of financial behaviors at that moment.

### ➤ **Data Analysis Techniques**



Data will be analyzed using statistical software such as SPSS or Excel. Techniques will include:

- **Descriptive statistics** for summarizing data (mean, median, mode).
- **Correlation analysis** to identify relationships between variables.
- **Regression analysis** to predict the impact of independent variables (e.g., pocket money, living status) on the dependent variable (spending pocket money).

## Results:

### Demographics:

#### ➤ Age Group:

- 20-22 → 64
- 17-19 → 47
- 23 or above → 9

Age  
120 responses

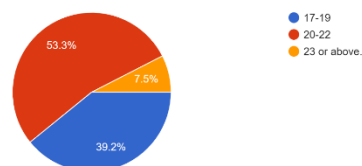


Figure 2.1

#### ➤ Gender:

- Male → 68
- Female → 50
- Prefer not to say → 2

Gender:  
120 responses

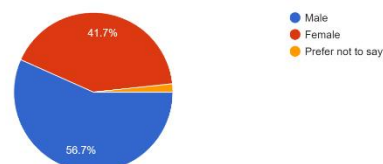


Figure 2.2

#### ➤ Living Status:

- Hosteller → 72
- Day Scholar → 48

What is your living status:  
120 responses

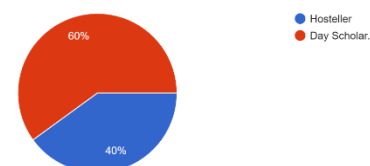


Figure 2.3

#### ➤ Pocket Money Range:

- below 10 → 55
- 11k - 20k → 38
- 21 or above → 27

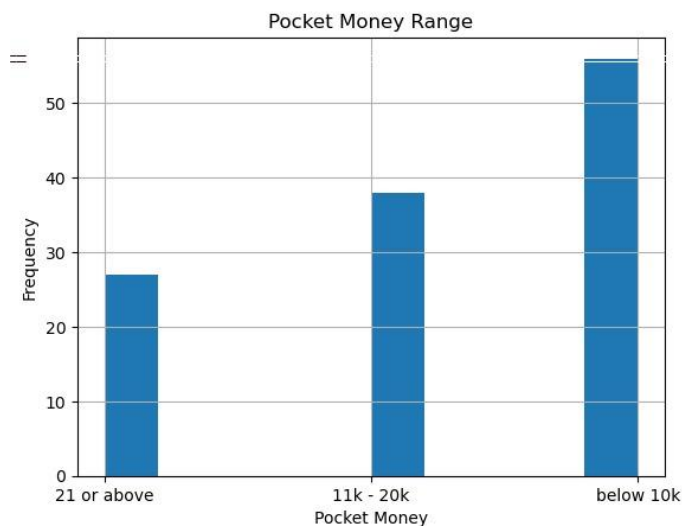


Figure 2.4

### • Descriptive:

#### ➤ Mean:

Mean:	
Age	19.958678
Semester	3.338843
Living Status	0.396694
Pocket Money Range	12636.363636
Is Your Pocket Money Sufficient	1.041322
Rent of Hostels	7214.876033
Mobile service Bills	2766.528926
Do you budget your pocket money	0.743802
Do you track your spending	0.702479
How often do you run out of money before the end of the month?	1.570248
Do you save a portion of your pocket money	0.785124
Are you Confident in managing finances	0.917355

Figure 3.1

#### ➤ Median:

Median:	
Age	21.0
Semester	3.0
Living Status	0.0
Pocket Money Range	15000.0
Is Your Pocket Money Sufficient	1.0
Rent of Hostels	0.0
Mobile service Bills	2500.0
Do you budget your pocket money	1.0
Do you track your spending	1.0
How often do you run out of money before the end of the month?	1.0
Do you save a portion of your pocket money	1.0
Are you Confident in managing finances	1.0

Figure 3.2

#### ➤ Mode:

Mode:	
Student Name	-
University Name	COMSATS University Islamabad
Roll Number	0
Age	21.0
Semester	2.0
Gender	1
Living Status	0.0
Pocket Money Range	7000.0
Is Your Pocket Money Sufficient	1.0
Spending On Public Transport	3000
Spending On Gasoline	0
Rent of Hostels	0.0
Mobile service Bills	2500.0
Do you budget your pocket money	1.0
Do you track your spending	1.0
How often do you run out of money before the end of the month?	1.0
If you run out of money, how do you manage the shortfall?	Cut down on expenses.
Biggest Challenge while Savings	unforeseen expenses
Do you save a portion of your pocket money	1.0
savings in Percentage	5
Are you Confident in managing finances	1.0
Suggestions	0

Figure 3.3

- **Multi validate Analysis:**

### Corelation:

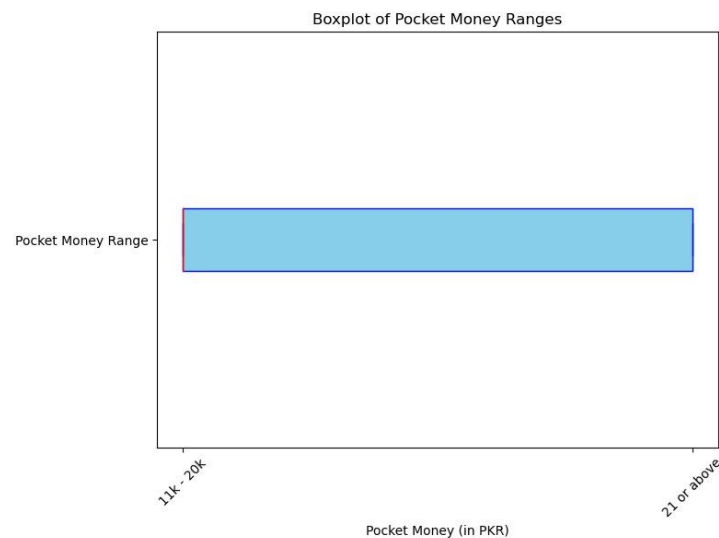


Figure 4.1

The boxplot shows the distribution of **pocket money ranges**. Many respondents fall within the **"11K-20K"** range. There are a few outliers in the **"21K or above"** range, indicating that some individuals receive significantly higher pocket money compared to the majority.

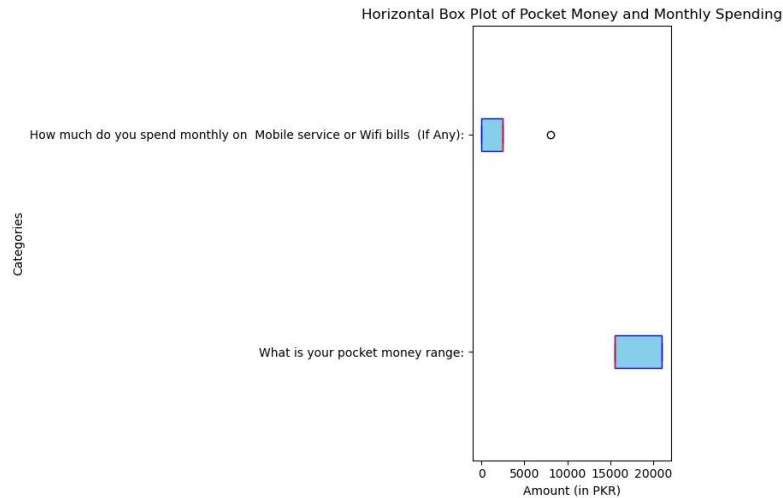


Figure 4.2

The boxplot compares monthly **mobile/WiFi spending** across **two pocket money ranges**. Individuals in the higher pocket money range tend to have a wider range of spending, suggesting they have more variability in these expenses. There is one outlier in the lower pocket money range, indicating an individual with unusually high mobile/WiFi spending.

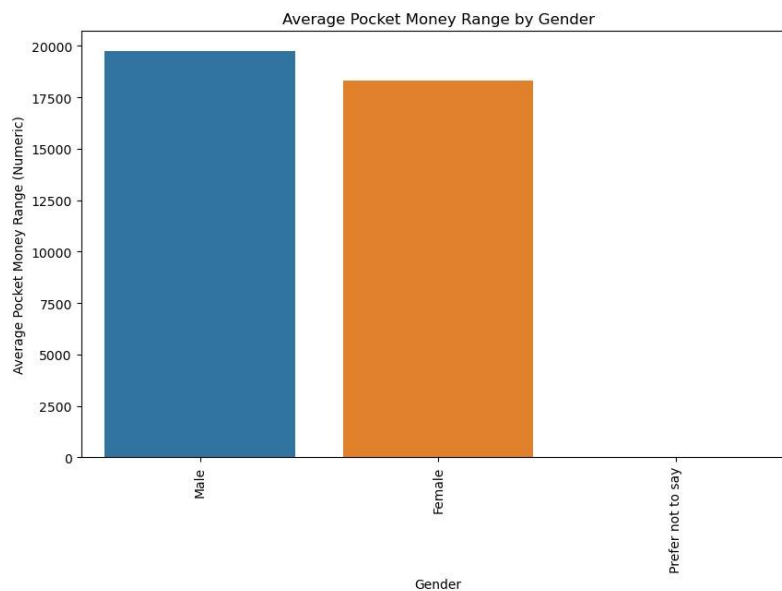


Figure 4.3

The bar chart shows the **average pocket money range** by gender. Males have a significantly higher average pocket money range compared to females. The "Prefer not to say" category has no data points.

### ➤ Correlation Matrix:

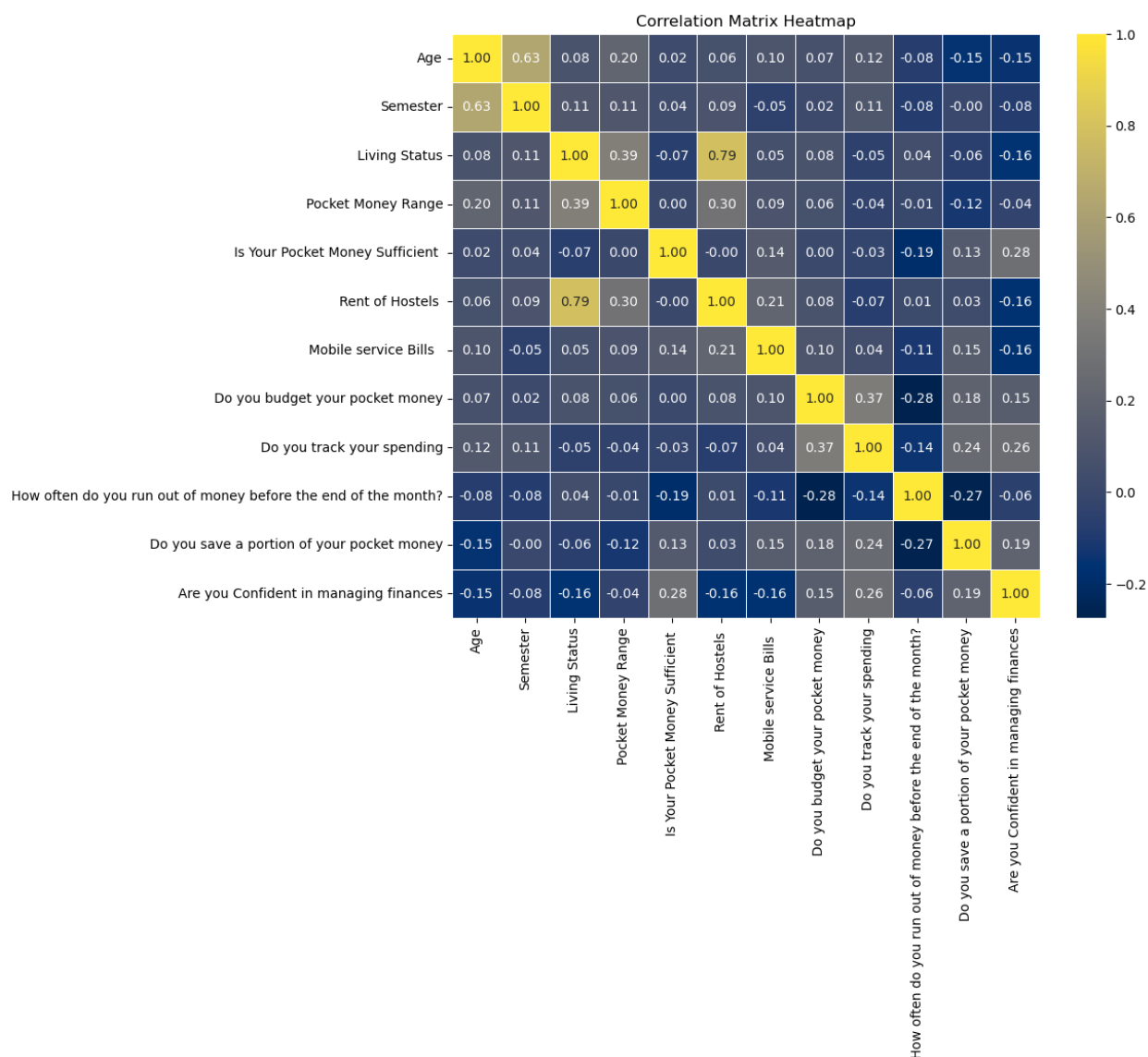


Figure 5.1

This heatmap visualizes the correlations between different variables related to student finances. Strong positive correlations are seen between living status and rent of hostels, and between budgeting and tracking spending. Strong negative correlations exist between saving money and running out of money frequently, and between saving money and confidence in managing finances.

### ➤ Justification:

#### Strong Positive Correlation:

- **Living Status and Rent of Hostels:** The correlation value is 0.79. This indicates a very strong positive relationship between the two variables, as expected.

- **Budgeting and Tracking Spending:** The correlation value is 0.28. This shows a moderate positive correlation, suggesting that budgeting practices are associated with a higher likelihood of tracking spending.

#### Strong Negative Correlation:

- **Saving Money and Running Out of Money Frequently:** The correlation value is -0.24. This indicates a moderate negative correlation, confirming the expectation that saving money is associated with a lower frequency of running out of money.
- **Saving Money and Confidence in Managing Finances:** The correlation value is -0.27. This shows a moderate negative correlation, supporting the notion that saving money is linked to higher confidence in managing finances.

#### ➤ Errors:

- **Mean Absolute Error (0.4643):** On average, the model's predictions deviate from the actual values by approximately 0.4643 units. This gives us an idea of the average magnitude of the errors.
  - **Mean Squared Error (0.3474):** This metric emphasizes larger errors more than MAE. A value of 0.3474 suggests that, on average, the squared difference between the predictions and actual values is 0.3474.
  - **R-squared Score (0.71):** This indicates that a substantial 71% of the variability in the dependent variable can be explained by the model's independent variables. This suggests a moderate fit between the model and the data, implying that the model is effective in capturing the underlying patterns.
-

## ➤ NLP For Suggestions Column:

### Step 1:

Importing data set and then typing a code for replacing all non-letter words with spaces:

```
import pandas as pd

# Read the CSV file
data = pd.read_csv(r"C:\Users\Hp\OneDrive\Desktop\Rtt Suggestion.csv", encoding='latin1') # Common fallback

# View the first 5 rows
data.head()
```

	Suggestions
0	V
1	Always save some money for any problem
2	NO??
3	You'll only learn actual financial management ...
4	At the start of each month, allocate a specifi...

```
import re

data1 = re.sub("[^a-zA-Z]", " ", data) # Replace all non-letters with spaces
str(data1)
```

### Step 2:

Importing NLTK Library and then typing a code for stop words and tokenization

Tokenization is the process of converting a sentence into single word.

Stopwords is used to replace the complex words to their base words.

```
import nltk
from nltk.tokenize import word_tokenize

nltk.download('punkt')
tokens = word_tokenize(data1) #The first step is for the analyst to break down sentences into individual words (or tokens!).
print(tokens)
```

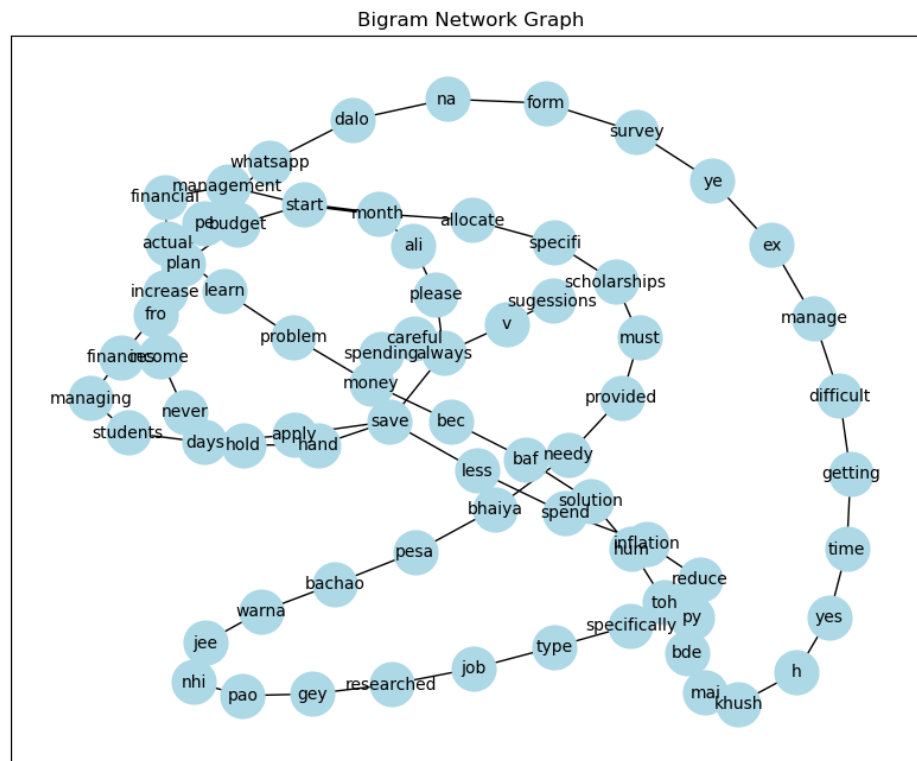
```
[27] ['Suggestions', 'V', 'Always', 'save', 'some', 'money', 'for', 'any', 'problem', 'NO', 'You', 'll', 'only', 'learn', 'actual', 'financial', 'management', 'At', 'the', 'start', 'of', 'ea
[nltk_data] Downloading package punkt to
[nltk_data]   C:\Users\Hp\AppData\Roaming\nltk_data...
[nltk_data]   Package punkt is already up-to-date!
```

```
import nltk
from nltk.corpus import stopwords

nltk.download('stopwords')
print(stopwords.words('english'))
```

```
[28] ['i', 'me', 'my', 'myself', 'we', 'our', 'ours', 'ourselves', 'you', "you're", "you've", "you'll", "you'd", 'your', 'yours', 'yourself', 'yourselves', 'he', 'him', 'his', 'himself', 's
[nltk_data] Downloading package stopwords to
[nltk_data]   C:\Users\Hp\AppData\Roaming\nltk_data...
[nltk_data]   Package stopwords is already up-to-date!]
```

## Creating a Bigram Network Graph







### References:

Lusardi, Annamaria, and Olivia S. Mitchell. 2014. "The Economic Importance of Financial Literacy: Theory and Evidence." *Journal of Economic Literature*, 52 (1): 5–44.

Allen, M. W., Edwards, R., Hayhoe, C. R., & Leach, L. (2007). Imagined interactions, family money management patterns and coalitions, and attitudes toward money and credit. *Journal of Family and Economic Issues*, 28, 3–22.

Hira, T. K., & Mugenda, O. (2000). Gender differences in financial perceptions, behaviors, and satisfaction. *Journal of Financial Planning*, 13(2), 86–92.

Zimmerman, M., & Katon, W. (2005). Behavioral and educational interventions in primary care for youth financial behaviors. *American Journal of Psychiatry*, 162(12), 2279–2284.

Loibl, C., Kraybill, D. S., & DeMay, S. W. (2011). Accounting for the role of habit in regular saving. *Journal of Economic Psychology*, 32(4), 581–592.