SHINY-BASED APP FOR ANALYZING MONTHLY POCKET MONEY USAGE

A PROJECT REPORT

Submitted by

VIMALSHREE M (2303811724322122)

in partial fulfillment of requirements for the award of the course

AGB1252 – FUNDAMENTALS OF DATA SCIENCE USING R

in

ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

K. RAMAKRISHNAN COLLEGE OF TECHNOLOGY

(An Autonomous Institution, affiliated to Anna University Chennai and Approved by AICTE, New Delhi)
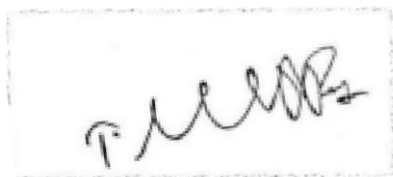
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JUNE-2025

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BONAFIDE CERTIFICATE

Certified that this project report on **"SHINY-BASED APP FOR ANALYZING MONTHLY POCKET MONEY USAGE"** is the bonafide work of **VIMALSHREE M (2303811724322122)** who carried out the project work during the academic year 2024 - 2025 under my supervision.

SIGNATURE

SIGNATURE

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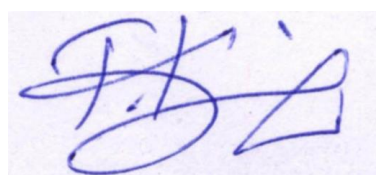K. Ramakrishnan College of Technology, (Autonomous)

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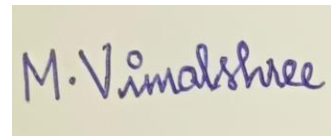Submitted for the viva-voce examination held on……**02.06.25**

INTERNAL EXAMINER

EXTERNAL EXAMINER

DECLARATION

I declare that the project report on "**SHINY-BASED APP FOR ANALYZING MONTHLY POCKET MONEY USAGE**" is the result of original work done by me and best of my knowledge, similar work has not been submitted to "**ANNA UNIVERSITY CHENNAI**" for the requirement of Degree of **BACHELOR OF TECHNOLOGY**. This project report is submitted on the partial fulfillment of the requirement of the award of the **AGB1252–FUNDAMENTALS OF DATA SCIENCE USING R.**

Signature

VIMALSHREE M

Place: Samayapuram

Date: 02/06/2025

ACKNOWLEDGEMENT

It is with great pride that I express our gratitude and indebtedness to our institution**, "K. Ramakrishnan College of Technology (Autonomous)",** for providing us with the opportunity to do this project.

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INSTITUTE:

Vision:

- To serve the society by offering top-notch technical education on par with global standards.

Mission:

- Be a center of excellence for technical education in emerging technologies by exceeding the needs of industry and society.
- Be an institute with world class research facilities.
- Be an institute nurturing talent and enhancing competency of students to transform them as all- round personalities respecting moral and ethical values.

DEPARTMENT

Vision:

- To excel in education, innovation and research in Artificial Intelligence and Data Science to fulfill industrial demands and societal expectations.

Mission:

- To educate future engineers with solid fundamentals, continually improving teaching methods using modern tools.
- To collaborate with industry and offer top-notch facilities in a conductive learning environment.
- To foster skilled engineers and ethical innovation in AI and Data Science for global recognition and impactful research.
- To tackle the societal challenge of producing capable professionals by instilling employability skills and human values.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- **PEO 1:** Compete on a global scale for a professional career in Artificial Intelligence and Data Science.
- **PEO 2:** Provide industry-specific solutions for the society with effective communication and ethics.
- **PEO 3:** Enhance their professional skills through research and lifelong learning initiatives.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- **PSO1:** Capable of finding the important factors in large datasets, simplify the data, and improve predictive model accuracy.

- **PSO2:** Capable of analyzing and providing a solution to a given real-world problem by designing an effective program.

PROGRAM OUTCOMES(POs)

Engineering students will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development.

3. **Design/development of solutions:** Design creative solutions for complex engineering problems and design/develop system/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required.

4. **Conduct investigations of complex problems:** Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions.

5. **Engineering tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering & IT tools, including prediction and modeling recognition their limitations to solve complex engineering problems.

6. **The Engineer and The World:** Analyze and evaluate societal and environment aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal, framework, culture and environment.

7. **Ethics:** Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws.

8. **Individual and collaborative team work:** Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. **Communication:** Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.

10. **Project management and finance:** Apply knowledge and understanding of t engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

11. **Life-long learning:** Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technological and iii) critical thinking in the broadest context of technological change.

ABSTRACT

Managing personal finances is an essential skill, particularly for students who often rely on a limited monthly allowance. The "Shiny-Based App for Analyzing Monthly Pocket Money Usage" is a web-based application developed using R and the Shiny framework. This project aims to help users monitor their monthly expenses, categorize spending, set budgets, and visualize financial patterns through interactive dashboards. The application features a user-friendly interface for entering expenses and tracking goals. Machine learning algorithms like Decision Trees and Random Forests are integrated to automate expense categorization. Furthermore, the app incorporates real-time visualizations using R libraries such as ggplot2 and DT to provide immediate feedback and insights. With personalized dashboards and intelligent analysis, this system supports users in making informed financial decisions and building sustainable budgeting habits.

ABSTRACT WITH POs AND PSOs MAPPING

CO5: BUILD DATABASES FOR SOLVING REAL-TIME PROBLEMS.

ABSTRACT	POs MAPPED	PSOs MAPPED
Managing personal finances is an essential skill, particularly for students who often rely on a limited monthly allowance. The "Shiny-Based App for Analyzing Monthly Pocket Money Usage" is a web-based application developed using R and the Shiny framework. This project aims to help users monitor their monthly expenses, categorize spending, set budgets, and visualize financial patterns through interactive dashboards. The application features a user-friendly interface for entering expenses and tracking goals. Machine learning algorithms like Decision Trees and Random Forests are integrated to automate expense categorization. Furthermore, the app incorporates real-time visualizations using R libraries such as ggplot2 and DT to provide immediate feedback and insights. With personalized dashboards and intelligent analysis, this system supports users in making informed financial decisions and building sustainable budgeting habits.	**PO1 -3** **PO2 -3** **PO3 -3** **PO5 -3** **PO6 -3** **PO9 -3** **PO11-3**	**PSO1 -3** **PSO2 -3**

Note: 1- Low, 2-Medium, 3- High

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CHAPTER 1

INTRODUCTION

1.1 OBJECTIVE

The objective of the "**Shiny-Based App for Analyzing Monthly Pocket Money Usage**" is to assist users, particularly students, in tracking, categorizing, and managing their monthly expenses with ease. The application aims to promote financial discipline through features such as automatic expense classification, budget monitoring, and real-time data visualization. It simplifies the process of understanding spending patterns and helps users stay within their budget, ultimately improving money management skills.

1.2 OVERVIEW

In today's fast-paced world, it is easy to lose track of how money is spent, especially when managing smaller budgets like student allowances. Manual tracking is time-consuming and often inconsistent. This application addresses such challenges by offering a convenient and automated solution. Users can log in, input their daily or monthly expenses, and immediately view categorized summaries and graphical reports. The system applies statistical and machine learning techniques to understand and predict spending behavior. It enhances the user's financial awareness while promoting better money management habits.

1.3 R LIBRARIES USED

1.User Interface (Shiny App):

- shiny – Builds interactive web applications.
- shinydashboard – Creates structured dashboard layouts.

2.Data Processing & Visualization:

- ggplot2 – Generates graphs and visualizations.
- dplyr – For data manipulation and filtering.
- tidyverse – A collection of data science packages including ggplot2, dplyr, and readr.
- DT – Displays interactive tables.

3.Machine Learning Models:

- rpart – Decision Trees for expense categorization.
- randomForest – Random Forest for classification of expenses.
- isotree – Isolation Forest for anomaly detection.
- kmeans – Built-in stats package function for clustering users based on spending patterns
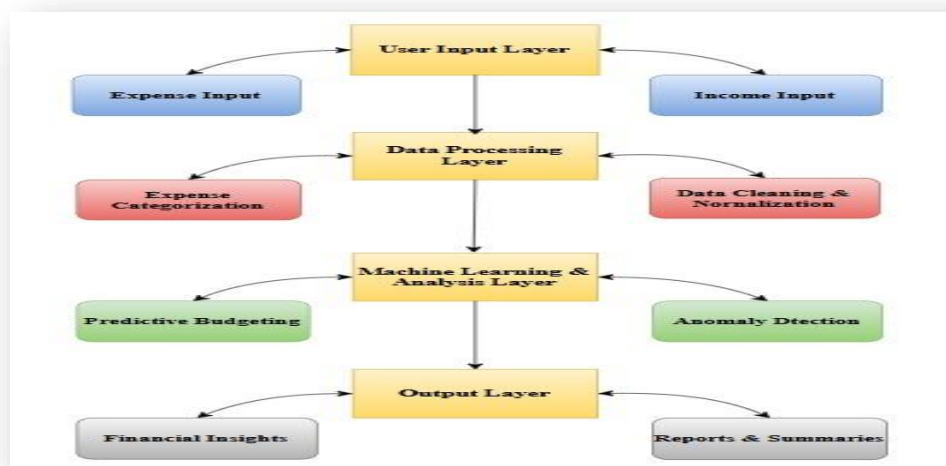
CHAPTER 2

PROJECT METHODOLOGY

2.1 PROPOSED WORK

1) Requirement Analysis: Identifying the essential functionalities such as data input, expense classification, budget limits, and visualization.

2) System Design: Structuring the application with modules like User Authentication, Expense Entry, Data Processing, and Visualization.

3) User Interface Development – Designing an intuitive dashboard using shiny and shinydashboard.

4) Machine Learning Integration – Using algorithms such as rpart, randomForest, and kmeans for categorization and pattern detection.

5) Data Storage & Manipulation – Using dplyr, tidyverse, and readr to manage structured data efficiently.

6) Testing & Debugging – Validating module performance, input validations, and visualization correctness.

2.2 BLOCK DIAGRAM

CHAPTER 3
MODULE DESCRIPTION

3.1 Module 1: User Authentication Module

- Allows users to register and log in securely.

- Ensures that data is stored and retrieved on a per-user basis, keeping records private and personal.

3.2 Module 2: Dashboard & UI Module

- Built using shiny and shinydashboard.
- Displays expenses in tabular form, pie charts, bar graphs, and budget meters.
- Allows navigation between data input, visual insights, and goal tracking.

3.3 Module 3: Expense Entry & Data Storage Module

- Enables users to input expense details such as date, amount, description, and category.
- Saves data into structured formats like .csv or memory tables.
- Allows filtering and sorting using the DT package.

3.4 Module 4: Expense Categorization Module

- Uses machine learning models like rpart and randomForest for classifying expenses.
- Supports clustering via kmeans to analyze user behavior.
- Anomaly detection using isotree helps flag irregular spending.

CHAPTER 4
CONCLUSION & FUTURE SCOPE

The Shiny-Based App for Analyzing Monthly Pocket Money Usage successfully provides users with a practical and interactive platform for managing their expenses. By integrating machine learning, data visualization, and a clean user interface, the app empowers users to become more financially disciplined. It reduces the friction associated with traditional expense tracking and provides immediate, actionable insights.

The modular approach ensures scalability, and the use of open-source technologies makes it accessible to a wide audience. Overall, the system encourages responsible financial behavior and helps users maintain better control over their monthly budgets.

FUTURE SCOPE:

- **Real-Time Expense Sync:** Integrate with Google Sheets, banking APIs, or e-wallets to automatically fetch and log expenses in real-time, reducing manual input.
- **Advanced Budget Forecasting:** Implement deep learning models (e.g., LSTM or Prophet) to predict future expenses and savings potential based on user behavior.
- **Gamification Features:** Introduce rewards, achievements, and goal progress indicators to keep users motivated in maintaining consistent expense tracking.
- **Multilingual & Voice Input Support:** Add support for local languages (e.g., Tamil) and voice-based expense entry to improve accessibility and user experience.

APPENDICES

APPENDIX A – SOURCE CODE

```
library(shiny)
expenses <- data.frame(
Date = as.Date(c("2025-04-01", "2025-04-05")),
Amount = c(100, 150),
Description = c("Lunch", "Movie"),
Category = c("Food", "Entertainment"),
stringsAsFactors = FALSE
)

ui <- fluidPage(
titlePanel ("Pocket Money Tracker"),
sidebarLayout(
sidebarPanel(
dateInput("date", "Date"),
numericInput("amount", "Amount", value = 0),
textInput("desc", "Description"),
selectInput("cat", "Category", choices = c("Food", "Entertainment", "Transport",
"Others")),
actionButton("add", "Add Expense")
),

mainPanel(
tableOutput("table"),
plotOutput("barPlot"))))
server <- function(input, output, session) {
data <- reactiveVal (expenses)
observeEvent(input$add, {
new <- data.frame( Date= input$date,
Amount= input$amount,
Description = input$desc,
Category= input$cat,
stringsAsFactors =FALSE
```
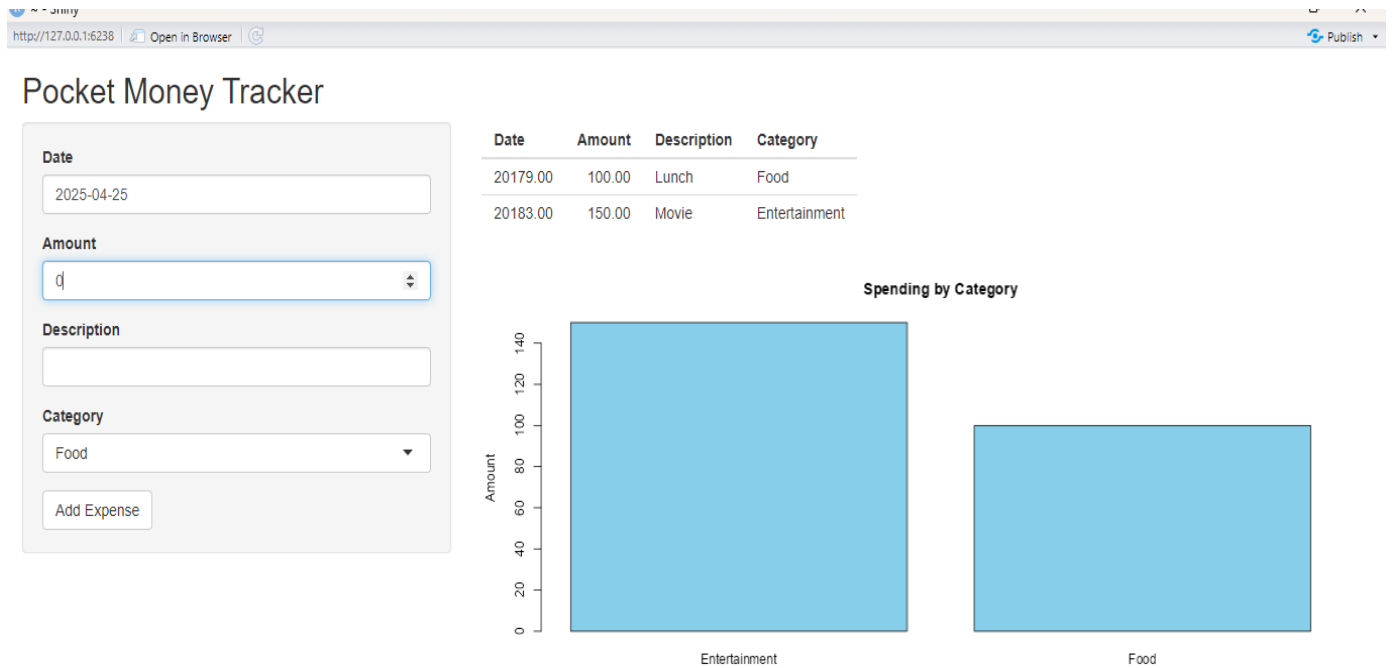
```
) data(rbind(data(), new))})
output$table <- renderTable({
data()
})
output$barPlot <- renderPlot({
d <- aggregate (Amount ~Category, data(), sum)
barplot(d$Amount, names.arg =d$Category, col = "skyblue", main "Spending by
Category", ylab = "Amount")
})
}
```

APPENDIX B – SCREEBSHOT

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4. Kuhn, Max & Johnson, Kjell. Applied Predictive Modeling, Springer.

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