



SIMATS ENGINEERING

SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES

CHENNAI-602105

**DSA0183 Object Oriented Programming with C++ for
Generic Programming**

CAPSTONE PROJECT REPORT

ON

Personal Finance Manager with Predictive Budgeting

Analysis

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DESCRIPTION:

Personal Finance Manager with Predictive Budgeting Analysis is a digital tool that helps individuals track income and expenses, categorize spending habits, and set budget goals. It uses predictive analytics to forecast future financial patterns and identify potential savings opportunities. This tool provides real-time insights, alerts for overspending, and personalized recommendations to improve financial management. By integrating with bank accounts and investment platforms, it offers a comprehensive overview of one's financial health and facilitates informed decision-making for achieving financial goals. Ultimately, it aims to optimize budgeting, reduce financial stress, and enhance long-term financial well-being.

A Personal Finance Manager with Predictive Budgeting is a revolutionary tool that revolutionizes the way individuals handle their finances. It's a comprehensive platform that seamlessly integrates various financial management functionalities, making it easier than ever for users to gain a comprehensive understanding of their financial situation. At its core, this software provides real-time transaction tracking, allowing users to monitor their spending habits effortlessly. By connecting to bank accounts, credit cards, and other financial institutions, it aggregates all financial data into one centralized dashboard, providing users with a clear overview of their income and expenses. What sets this platform apart is its predictive budgeting feature, powered by sophisticated algorithms that analyze past spending patterns and predict future expenses. This predictive capability enables users to create realistic budgets tailored to their individual financial circumstances, ensuring they stay on track towards their financial goals. Moreover, the software offers proactive alerts and notifications to warn users of potential overspending or deviations from their budget, empowering them to make informed financial decisions in real-time. Beyond budgeting, the platform also includes features such

as goal setting, debt management tools, investment tracking, and personalized recommendations to optimize financial outcomes. Its intuitive interface and user-friendly design make it accessible to individuals of all financial literacy levels, providing them with the tools they need to take control of their finances confidently. Ultimately, a Personal Finance Manager with Predictive Budgeting transforms financial management from a daunting task into a streamlined, proactive process, enabling users to achieve greater financial stability and success.

Introduction:

The Personal Finance Manager with Predictive Budgeting Analysis represents a cutting-edge approach to personal finance management by leveraging technology to provide users with insightful financial analysis and planning tools. This innovative application aims to revolutionize how individuals manage their money and achieve their financial goals. The Personal Finance Manager is a web application that helps users manage their finances by tracking income, expenses, and savings. It provides features for adding, categorizing, and analyzing transactions, as well as setting and monitoring financial goals. At its core, the Personal Finance Manager simplifies financial tracking by allowing users to input and categorize their transactions effortlessly. By providing a clear overview of their financial activities, users can better understand their spending habits and identify areas for improvement. With personalized recommendations and budgeting features, users can stay on track towards achieving their goals and making informed financial decisions. Moreover, the application is designed to be accessible from any device with an internet connection, providing users with the flexibility to manage their finances anytime, anywhere.

Objectives:

The key objectives of this solution are:

Comprehensive Financial Overview:

- ❖ To offer users a holistic view of their financial status, including income sources, expenses, savings, and investments.

Predictive Budgeting:

- ❖ To use predictive analytics to forecast future spending patterns and assist users in creating realistic budgets.

Behavioral Finance Insights:

- ❖ To analyze spending behavior and provide personalized recommendations to improve financial habits.

Financial Education:

- ❖ To promote financial literacy by educating users on budgeting, saving strategies, and investment basics.

Ease of Use:

- ❖ To provide a user-friendly interface that simplifies financial management and planning, catering to users of varying levels of financial expertise.

Problem Statement:

- ❖ The application addresses common challenges faced by individuals in managing their finances effectively, including:
- ❖ Difficulty in tracking and categorizing expenses manually.

- ❖ Lack of awareness about spending patterns and areas for potential savings.
- ❖ Limited understanding of how to create and stick to a budget.
- ❖ Insufficient tools to predict future financial needs and plan accordingly.
Difficulty in tracking and categorizing multiple sources of financial transactions.
- ❖ Lack of visibility into real-time spending habits leading to overspending.
- ❖ Inability to create realistic budgets based on past spending patterns.
Challenges in predicting future expenses and financial obligations.
- ❖ Limited proactive alerts and notifications to warn of potential overspending.
Absence of tools for setting and tracking financial goals.
- ❖ Difficulty in managing debts and loans efficiently. Lack of investment tracking capabilities to monitor portfolio performance.
- ❖ Absence of personalized recommendations for optimizing financial outcomes.
- ❖ Overwhelming complexity and lack of user-friendliness in existing financial management tools. Inefficient integration of various financial accounts and platforms.
- ❖ Inadequate support for individuals with varying levels of financial literacy.
- ❖ Difficulty in accessing comprehensive financial insights and analysis.
- ❖ Lack of a centralized dashboard for viewing all financial information in one place. Limited tools for proactive financial decision-making and planning.

Functionality:

The Personal Finance Manager with Predictive Budgeting Analysis includes the following core functionalities:

Expense Tracking: Allows users to automatically track and categorize expenses from linked accounts or through manual inputs.

Budget Creation and Monitoring: Enables users to set budgets for different categories and provides real-time updates on spending against these budgets.

Income Management: Integrates with multiple income sources to provide an accurate picture of earnings.

Predictive Analytics: Utilizes historical data and algorithms to forecast future spending trends and identify potential savings opportunities.

Goal Setting and Tracking: Allows users to set financial goals and provides actionable steps to achieve them.

Financial Reporting: Generates detailed reports and visualizations to illustrate financial health and progress over time.

Future Scope:

The future development of this Personal Finance Manager could involve:

Enhanced Security Features: Implementing robust security measures to protect users' financial data and privacy.

Machine Learning Algorithms: Integrating advanced machine learning models to enhance predictive capabilities and provide more personalized recommendations.

Integration with Investment Platforms: Enabling integration with investment platforms to provide a comprehensive view of users' financial portfolios.

Collaborations with Financial Institutions: Partnering with banks and financial institutions to offer seamless transaction integration and account management.

Mobile App Expansion: Developing a mobile application to allow users to manage their finances on the go.

In conclusion, the Personal Finance Manager with Predictive Budgeting Analysis is poised to transform personal finance management by harnessing technology to empower users with actionable insights and tools for effective financial planning and decision-making. Its future evolution promises even greater functionality and accessibility, ultimately improving users' financial well-being and confidence in managing their money.

CODE:

```
#include <iostream>

#include <vector>

#include <string>

using namespace std;

struct Transaction {

    string description;

    double amount;

};

class FinanceManager {

private:

    vector<Transaction> transactions;

public:

    void addTransaction(const string& description, double amount) {

        Transaction newTransaction;
```

```
newTransaction.description = description;

newTransaction.amount = amount;

transactions.push_back(newTransaction);

cout << "Transaction added successfully." << endl;

}

void updateTransaction(int index, const string& description, double amount) {

if (index >= 0 && index < transactions.size()) {

transactions[index].description = description;

transactions[index].amount = amount;

cout << "Transaction updated successfully." << endl;

} else {

cout << "Invalid index." << endl;

}

}

void removeTransaction(int index) {

if (index >= 0 && index < transactions.size()) {

transactions.erase(transactions.begin() + index);

cout << "Transaction removed successfully." << endl;

} else {

cout << "Invalid index." << endl;
```



```

    }

}

void displayTransactions() {

if (transactions.empty()) {

cout << "No transactions recorded." << endl;

} else {

cout << "Transactions:" << endl;

for (int i = 0; i < transactions.size(); ++i) {

cout << i << ". " << transactions[i].description << "- $" <<

transactions[i].amount << endl;

}

}

}

};

int main() {

FinanceManager manager;

char choice;

do {

cout << "Menu:" << endl;

cout << "1. Add Transaction" << endl;

```

```
cout << "2. Update Transaction" << endl;

cout << "3. Remove Transaction" << endl;

cout << "4. Display Transactions" << endl;

cout << "5. Exit" << endl;

cout << "Enter your choice: ";

cin >> choice;

switch (choice) {

case '1': {

string description;

double amount;

cout << "Enter description: ";

cin.ignore();

getline(cin, description);

cout << "Enter amount: ";

cin >> amount;

manager.addTransaction(description, amount);

break;

}

case '2': {

int index;
```

```
string description;

double amount;

manager.displayTransactions();

cout << "Enter index of transaction to update: ";

cin >> index;

cout << "Enter new description: ";

cin.ignore();

getline(cin, description);

cout << "Enter new amount: ";

cin >> amount;

manager.updateTransaction(index, description, amount);

break;

}

case '3': {

int index;

manager.displayTransactions();

cout << "Enter index of transaction to remove: ";

cin >> index;

manager.removeTransaction(index);

break;
```

```
}  
  
case '4':  
  
    manager.displayTransactions();  
  
    break;  
  
case '5':  
  
    cout << "Exiting program." << endl;  
  
    break;  
  
default:  
  
    cout << "Invalid choice. Please try again." << endl;  
  
    break;  
  
}  
  
} while (choice != '5');  
  
return 0;  
  
}
```

OUTPUT:

/tmp/W4Q8Mb25F7.o

Menu:

1. Add Transaction
2. Update Transaction
3. Remove Transaction
4. Display Transactions
5. Exit

Enter your choice: 1

Enter description: adding first transaction

Enter amount: 1000

Transaction added successfully.

Menu:

1. Add Transaction
2. Update Transaction
3. Remove Transaction
4. Display Transactions
5. Exit

Enter your choice: 1

Enter description: adding second transaction

Enter amount: 300

Transaction added successfully.

Menu:

1. Add Transaction
2. Update Transaction
3. Remove Transaction
4. Display Transactions
5. Exit

Enter your choice: 2

Transactions:

0. adding first transaction- \$1000
1. adding second transaction- \$300

Enter index of transaction to update: 0

Enter new description: updating the first transaction

Enter new amount: 500

Transaction updated successfully.

Menu:

1. Add Transaction
2. Update Transaction
3. Remove Transaction
4. Display Transactions
5. Exit

Enter your choice: 3

Transactions:

0. updating the first transaction - \$500
1. adding second transaction- \$300

Enter index of transaction to remove: 1

Transaction removed successfully.

```
Menu:
1. Add Transaction
2. Update Transaction
3. Remove Transaction
4. Display Transactions
5. Exit
Enter your choice: 4
Transactions:
0. updating the first transaction - $500
Menu:
1. Add Transaction
2. Update Transaction
3. Remove Transaction
4. Display Transactions
5. Exit
Enter your choice: 5
Exiting program.

=== Code Execution Successful ===|
```

CONCLUSION:

- ❖ In summary, the Personal Finance Manager is a comprehensive web application
- ❖ that simplifies financial management for individuals of all backgrounds. By
- ❖ offering features for transaction tracking, categorization, analysis, goal setting, and
- ❖ secure data management, the application empowers users to take control of their

❖ finances and work towards their financial goals with confidence and ease.

Whether

❖ you're a seasoned investor or just starting on your financial journey, the

Personal

❖ Finance Manager is your trusted companion for achieving financial success