Test Plan

CMSC115

Chapter 2, Project 5

October 30, 2024

**Program Goals & Objectives**

The purpose of this program is to calculate the future investment value based on the user’s input of the investment amount, annual interest rate, and number of years, using the compound interest formula.

**Program Functional Requirements**

1. The program should prompt the user to enter the investment amount.

2. The user should be able to enter the investment amount as a numerical value.

3. The program should prompt the user to enter the annual interest rate in percentage.

4. The user should be able to enter the annual interest rate as a numerical value.

5. The program should calculate the monthly interest rate by dividing the annual interest rate by 1200.

6. The program should prompt the user to enter the number of years.

7. The user should be able to enter the number of years as a numerical value.

8. The program should calculate the future investment value using the formula:

• futureInvestmentValue = investmentAmount \* (1 + monthlyInterestRate)^(12 \* numberOfYears)

9. The program should display the accumulated value to the user, formatted to two decimal places.

**Program Pseudocode**

START

Prompt user to "Enter investment amount: "

Read investmentAmount

Prompt user to "Enter annual interest rate in percentage: "

Read AnnualInterestRate

monthlyInterestRate = AnnualInterestRate / 1200

Prompt user to "Enter number of years: "

Read numberOfYears

futureInvestmentValue = investmentAmount \* (1 + monthlyInterestRate)^(12 \* numberOfYears)

Display "Accumulated value is $" formatted futureInvestmentValue to two decimal places

END

**Program Flowchart**

A diagram of a company

Description automatically generated

**Table 1 – Traceability Matrix**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Case | Input/Output | Expected Result | Actual Result | Outcome  (Pass/Fail) |
| 1a | User enters investment amount: 9000 | A message prompting the user appears on the screen: Enter annual interest rate in percentage: | A message prompting the user appears on the screen: Enter annual interest rate in percentage: | Pass |
| 2a | User enters interest rate amount as string literal “four point five” | Program should handle invalid input appropriately | Program crashes with an InputMistmatchException | Fail |
| 3a | User enters number of years: -5 | Program should handle invalid input and tell user to enter positive integers | A message displays the result of the accumulated value calculation: “Accumulated value is $7189.67” | Fail |