**Problem Description**:

**Program #1: Calculating Future Investment Value**

Write a program that reads in investment amount, annual interest rate, and number of years, and displays the future investment value using the following formula:

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

For example, if you enter amount 1000, annual interest rate 3.25%, and number of years 1, the future investment value is 1032.98. (**This is test data!!)**

Hint: Use the Math.pow(a, b) method to compute a raised to the power of b.

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Here is a sample run: (**another set of test data!!)**

Sample:

Enter investment amount: 1000

Enter annual interest rate: 4.25

Enter number of years: 1

Accumulated value is 1043.34

Another run

Enter the amount to invest:186000

Enter the APR :9

Enter the years:16

186000.0 invested at 9.0% for 16.0 years is:780842.55

BUILD SUCCESSFUL (total time: 22 seconds)

**Analysis:**

**Ask the user for the following values.**

**Inputs: Outputs:**

-Investment amount -Future Investment Value

-Interest (monthly interest rate)

-Years investing

**Convert:**

-using the provided equation:

Future\_Investment = Investment\_Amount x (1 + Monthly\_Interest\_Rate) ^(years x12)

**Design**:

(Describe the major steps for solving the problem.)

1st –prompt the user for initial investment amount. After doing this the value needs to be assigned as a double then added into the equation

2nd prompt the user for the monthly interest in decimal form then square the answer by the number of years the user enters

3rd correctly calculate and display the future investment value

**Testing**: (Describe how you tested this program)

Ran values that accumulated. Results similar to test values

The internal monthlyinterestrate needed to be converted to a percentage.

However there needs to be a formatted print statement at the end of the program before the system displays the data.

Used the following runs to compare the results of the program

**Run (Test Data 1)**

run:

This Program Calculates Future investment

values.

Please Enter an inital investment amount:

1000

Enter the annual investment rate:

3.25

Finally Enter the desired investment duration in years:

1

Your Future Investment is: 1032.99

BUILD SUCCESSFUL (total time: 15 seconds)

)

**Run(Test Data 2)**

run:

This Program Calculates Future investment

values.

Please Enter an inital investment amount:

1000

Enter the annual investment rate:

4.25

Finally Enter the desired investment duration in years:

1

Your Future Investment is: 1043.34

BUILD SUCCESSFUL (total time: 7 seconds)

**Run(Test Data 3)**

run:

This Program Calculates Future investment

values.

Please Enter an inital investment amount:

186000

Enter the annual investment rate:

9

Finally Enter the desired investment duration in years:

16

Your Future Investment is: 780842.55

BUILD SUCCESSFUL (total time: 14 seconds)

**Code**

investment;

import java.util.Scanner;

public class Investment {

public static void main(String[] args) {

Scanner kb = new Scanner(System.in);

System.out.println("This Program Calculates Future investment\nvalues.");

System.out.println("Please Enter an inital investment amount:");

double investmentAmount = kb.nextInt();

System.out.println("Enter the annual investment rate: ");

double monthlyInterestRate = kb.nextDouble();

System.out.println("Finally Enter the desired investment duration in years: ");

int numberOfYears = kb.nextInt();

// data is received from the user then calculated and assigned the variable furtureInvestmentValue

double futureInvestmentValue = investmentAmount \* Math.pow(((1+ (monthlyInterestRate / 100) / 12) ), (numberOfYears \* 12));

System.out.printf("Your Future Investment is:" + "%10.2f%n", futureInvestmentValue);// Format the output to two decimal places

}//Main

}//Class

Runtime Code:

**Set 1:**

Test Data :

run:

This Program Calculates Future investment

values.

Please Enter an inital investment amount:

1000

Enter the annual investment rate:

4.25

Finally Enter the desired investment duration in years:

1

Your Future Investment is: 1043.34

BUILD SUCCESSFUL (total time: 7 seconds)

**Set 2:**

run:

This Program Calculates Future investment

values.

Please Enter an inital investment amount:

12000

Enter the annual investment rate:

59

Finally Enter the desired investment duration in years:

2

Your Future Investment is: 37970.72

BUILD SUCCESSFUL (total time: 14 seconds)

**Set 3:**

run:

This Program Calculates Future investment

values.

Please Enter an inital investment amount:

18

Enter the annual investment rate:

2.5

Finally Enter the desired investment duration in years:

59

Your Future Investment is: 78.56

BUILD SUCCESSFUL (total time: 10 seconds)

Checklist:

1. \_\_\_\_\_\_\_\_ Top Page (Analysis, Design, Testing)
2. \_\_\_\_\_\_\_\_ Top Documentation in code
3. \_\_\_\_\_\_\_\_ Internal Documentation
   1. Brackets labeled
   2. Internal *tricky code* uses
4. \_\_\_\_\_\_\_\_\_ Runtimes
   1. Test data
   2. 3 sets of other data