Kyle Carney

CSC 1051-1

Project 4: Investment Calculator

The project took me a while, but I was so happy when I finally got it fully functional. The biggest problem for me was the loop after printing the year 1 values. I ended up creating so many different variables and trying a lot of different tests to get it to work. I found myself deleting everything past the table heading a few times and going back and trying to rewrite the algorithm by hand. It seemed like when I got to print the balance correct the interest would not compute right and vice versa. I knew where my problem was, but not exactly what the problem was. Finally, I asked Rick Carbone from class for some help and he told me how he initiated the variables for interest and balance. I believe it was the order in which I was initializing the variables. I knew that I needed to establish the interest first and then that would allow me to compute the balance.

I thought the project was harder than expected, but only because I struggled with the algorithm. After Rick helped me I was able to try a few things and get it operating quickly. I really enjoyed the project because it was a challenge and I also think there was a lot of practical learning involved. I can see how utilizing this type of program would be useful and I learned how a program can be affected by the order in which you initialize the variables.

After running more test cases I realized that years was incrementing right through the program without resetting. For instance, if the user inputs 1 and the program continues, the year was continuing from where it left off previously. I was able to just set year equal to 1 before the input for do again.

Kyle Carney

Project 4: Algorithm

1 variables: doAgain, year, initialInvestment, targetValue,

interestRate, balance, interest  
 2   
 3 algorithm:  
 4   
 5 doAgain = 1  
 6 year = 1   
 7   
 8 while (doAgain = 1)  
 9   
10 print enter initial investment  
11 input initial investment  
12   
13 print enter target value  
14 input target value  
15   
16 print enter interest rate  
17 input interest rate  
18   
19 print starting balance & interest rate  
20   
21 print table header with "year", "interest", and "balance"  
22   
23 interest = initialInvestment \* (interestRate / 100)  
24 balance = interest + initialInvestment  
25   
26 print values for year, interest, and balance  
27   
28 while (balance < target)  
29 year++  
30 initialInvestment = balance;  
31 interest = initialInvestment \* (interestRate/100);  
32 balance = interest + balance;  
33 print year, interest, and balance  
34   
35 print do another?  
36 year = 1  
37 input yes or no

Kyle Carney

Project 4: Source Code

1 //\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
 2 // InvestmentCalculator.java Author: Kyle Carney  
 3 // Project 4  
 4 //\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
 5   
 6 //imports  
 7 import java.text.NumberFormat;  
 8 import java.util.Scanner;  
 9 public class InvestmentCalculator  
10 {  
11   
12 public static void main (String[] args){  
13 //initialize scanner  
14 Scanner scan = new Scanner(System.in);  
15   
16 //declare variables doAgain, year, initialInvestment, interestRate,   
17 //balance, and interest  
18 int doAgain, year;  
19 double initialInvestment, targetValue, interestRate, balance, interest;  
20   
21 //initialize variables doAgain & year  
22 doAgain = 1;  
23 year = 1;  
24   
25 //initialize NumberFormat for currency and percent  
26 NumberFormat fmt = NumberFormat.getCurrencyInstance();  
27 NumberFormat fmt2 = NumberFormat.getPercentInstance();  
28   
29 //print do again?  
30 while (doAgain == 1) {   
31 //print enter initial investment  
32 System.out.print("Please enter your initial investment: ");  
33 //input initial investment  
34 initialInvestment = scan.nextDouble();  
35   
36 //print enter target value  
37 System.out.print("Please enter your target value: ");  
38 //input target value  
39 targetValue = scan.nextDouble();  
40   
41 //print enter interest rate  
42 System.out.print("Please enter your interest rate" +  
43 " (for example, enter 5 for 5%): ");  
44 //input interest rate  
45 interestRate = scan.nextDouble();  
46   
47 //print starting balance and interest rate  
48 System.out.print("\n\nStarting balance: " +   
49 fmt.format(initialInvestment) +   
50 "\t\tInterest rate: " + fmt2.format(interestRate/100));  
51   
52 //print table header with year, interest, and balance  
53 System.out.println("\n\nYear" + "\tInterest" + "\t\tBalance");  
54   
55 //initialize variables interest & balance  
56 interest = initialInvestment \* (interestRate / 100);  
57 balance = interest + initialInvestment;  
58   
59 //print year, interest, and balance values  
60 System.out.println(year + "\t\t" + fmt.format(interest) +   
61 "\t\t" + fmt.format(balance));  
62   
63 //while (balance < targetValue)  
64 while (balance < targetValue) {  
65 //increment year  
66 year++;  
67 //re-initialize initialInvestment, interest, and balance  
68 initialInvestment = balance;  
69 interest = initialInvestment \* (interestRate/100);  
70 balance = interest + balance;  
71 //print year, interest, and balance  
72 System.out.println(year + "\t\t" + fmt.format(interest) +   
73 "\t\t" + fmt.format(balance));  
74   
75 }  
76 //print do again?  
77 System.out.println("\n\nWould you like to do another? (NO=0, YES=1)");  
78 //year = 1  
79 year=1;  
80 //input do again  
81 doAgain = scan.nextInt();  
82 }}}

Kyle Carney

Project 4: Test Cases

\*\*\*Program stops and keeps going as appropriate\*\*\*

 ----jGRASP exec: java InvestmentCalculator  
Please enter your initial investment: 5  
Please enter your target value: 10  
Please enter your interest rate (for example, enter 5 for 5%): 10  
  
  
Starting balance: $5.00 Interest rate: 10%  
  
Year Interest Balance  
1 $0.50 $5.50  
2 $0.55 $6.05  
3 $0.60 $6.65  
4 $0.67 $7.32  
5 $0.73 $8.05  
6 $0.81 $8.86  
7 $0.89 $9.74  
8 $0.97 $10.72  
  
  
Would you like to do another? (NO=0, YES=1)  
1  
Please enter your initial investment: 10000  
Please enter your target value: 15000  
Please enter your interest rate (for example, enter 5 for 5%): 8  
  
  
Starting balance: $10,000.00 Interest rate: 8%  
  
Year Interest Balance  
1 $800.00 $10,800.00  
2 $864.00 $11,664.00  
3 $933.12 $12,597.12  
4 $1,007.77 $13,604.89  
5 $1,088.39 $14,693.28  
6 $1,175.46 $15,868.74  
  
  
Would you like to do another? (NO=0, YES=1)  
0  
  
 ----jGRASP: operation complete.  


\*\*\*Large numbers and small numbers\*\*\*

 ----jGRASP exec: java InvestmentCalculator  
Please enter your initial investment: 500000  
Please enter your target value: 1000000  
Please enter your interest rate (for example, enter 5 for 5%): 8  
  
  
Starting balance: $500,000.00 Interest rate: 8%  
  
Year Interest Balance  
1 $40,000.00 $540,000.00  
2 $43,200.00 $583,200.00  
3 $46,656.00 $629,856.00  
4 $50,388.48 $680,244.48  
5 $54,419.56 $734,664.04  
6 $58,773.12 $793,437.16  
7 $63,474.97 $856,912.13  
8 $68,552.97 $925,465.11  
9 $74,037.21 $999,502.31  
10 $79,960.19 $1,079,462.50  
  
  
Would you like to do another? (NO=0, YES=1)  
1  
Please enter your initial investment: 2  
Please enter your target value: 10  
Please enter your interest rate (for example, enter 5 for 5%): 8  
  
  
Starting balance: $2.00 Interest rate: 8%  
  
Year Interest Balance  
1 $0.16 $2.16  
2 $0.17 $2.33  
3 $0.19 $2.52  
4 $0.20 $2.72  
5 $0.22 $2.94  
6 $0.24 $3.17  
7 $0.25 $3.43  
8 $0.27 $3.70  
9 $0.30 $4.00  
10 $0.32 $4.32  
11 $0.35 $4.66  
12 $0.37 $5.04  
13 $0.40 $5.44  
14 $0.44 $5.87  
15 $0.47 $6.34  
16 $0.51 $6.85  
17 $0.55 $7.40  
18 $0.59 $7.99  
19 $0.64 $8.63  
20 $0.69 $9.32  
21 $0.75 $10.07  
  
  
Would you like to do another? (NO=0, YES=1)  
0  
  
 ----jGRASP: operation complete.  
  
\*\*\*Target is equal to the original balance\*\*\*

 ----jGRASP exec: java InvestmentCalculator  
Please enter your initial investment: 100  
Please enter your target value: 100  
Please enter your interest rate (for example, enter 5 for 5%): 5  
  
  
Starting balance: $100.00 Interest rate: 5%  
  
Year Interest Balance  
1 $5.00 $105.00  
  
  
Would you like to do another? (NO=0, YES=1)  


\*\*\*Other tests\*\*\*

 ----jGRASP exec: java InvestmentCalculator  
Please enter your initial investment: 83000  
Please enter your target value: 1000000  
Please enter your interest rate (for example, enter 5 for 5%): 8  
  
  
Starting balance: $83,000.00 Interest rate: 8%  
  
Year Interest Balance  
1 $6,640.00 $89,640.00  
2 $7,171.20 $96,811.20  
3 $7,744.90 $104,556.10  
4 $8,364.49 $112,920.58  
5 $9,033.65 $121,954.23  
6 $9,756.34 $131,710.57  
7 $10,536.85 $142,247.41  
8 $11,379.79 $153,627.21  
9 $12,290.18 $165,917.38  
10 $13,273.39 $179,190.77  
11 $14,335.26 $193,526.04  
12 $15,482.08 $209,008.12  
13 $16,720.65 $225,728.77  
14 $18,058.30 $243,787.07  
15 $19,502.97 $263,290.04  
16 $21,063.20 $284,353.24  
17 $22,748.26 $307,101.50  
18 $24,568.12 $331,669.62  
19 $26,533.57 $358,203.19  
20 $28,656.26 $386,859.44  
21 $30,948.76 $417,808.20  
22 $33,424.66 $451,232.85  
23 $36,098.63 $487,331.48  
24 $38,986.52 $526,318.00  
25 $42,105.44 $568,423.44  
26 $45,473.88 $613,897.32  
27 $49,111.79 $663,009.10  
28 $53,040.73 $716,049.83  
29 $57,283.99 $773,333.82  
30 $61,866.71 $835,200.52  
31 $66,816.04 $902,016.56  
32 $72,161.33 $974,177.89  
33 $77,934.23 $1,052,112.12  
  
  
Would you like to do another? (NO=0, YES=1)  
1  
Please enter your initial investment: 83000  
Please enter your target value: 1000000  
Please enter your interest rate (for example, enter 5 for 5%): 15  
  
  
Starting balance: $83,000.00 Interest rate: 15%  
  
Year Interest Balance  
1 $12,450.00 $95,450.00  
2 $14,317.50 $109,767.50  
3 $16,465.12 $126,232.62  
4 $18,934.89 $145,167.52  
5 $21,775.13 $166,942.65  
6 $25,041.40 $191,984.04  
7 $28,797.61 $220,781.65  
8 $33,117.25 $253,898.90  
9 $38,084.83 $291,983.73  
10 $43,797.56 $335,781.29  
11 $50,367.19 $386,148.49  
12 $57,922.27 $444,070.76  
13 $66,610.61 $510,681.37  
14 $76,602.21 $587,283.58  
15 $88,092.54 $675,376.12  
16 $101,306.42 $776,682.53  
17 $116,502.38 $893,184.91  
18 $133,977.74 $1,027,162.65  
  
  
Would you like to do another? (NO=0, YES=1)  
0  
  
 ----jGRASP: operation complete.  


  
 ----jGRASP exec: java InvestmentCalculator  
Please enter your initial investment: 100  
Please enter your target value: 10000  
Please enter your interest rate (for example, enter 5 for 5%): 10  
  
  
Starting balance: $100.00 Interest rate: 10%  
  
Year Interest Balance  
1 $10.00 $110.00  
2 $11.00 $121.00  
3 $12.10 $133.10  
4 $13.31 $146.41  
5 $14.64 $161.05  
6 $16.11 $177.16  
7 $17.72 $194.87  
8 $19.49 $214.36  
9 $21.44 $235.79  
10 $23.58 $259.37  
11 $25.94 $285.31  
12 $28.53 $313.84  
13 $31.38 $345.23  
14 $34.52 $379.75  
15 $37.97 $417.72  
16 $41.77 $459.50  
17 $45.95 $505.45  
18 $50.54 $555.99  
19 $55.60 $611.59  
20 $61.16 $672.75  
21 $67.27 $740.02  
22 $74.00 $814.03  
23 $81.40 $895.43  
24 $89.54 $984.97  
25 $98.50 $1,083.47  
26 $108.35 $1,191.82  
27 $119.18 $1,311.00  
28 $131.10 $1,442.10  
29 $144.21 $1,586.31  
30 $158.63 $1,744.94  
31 $174.49 $1,919.43  
32 $191.94 $2,111.38  
33 $211.14 $2,322.52  
34 $232.25 $2,554.77  
35 $255.48 $2,810.24  
36 $281.02 $3,091.27  
37 $309.13 $3,400.39  
38 $340.04 $3,740.43  
39 $374.04 $4,114.48  
40 $411.45 $4,525.93  
41 $452.59 $4,978.52  
42 $497.85 $5,476.37  
43 $547.64 $6,024.01  
44 $602.40 $6,626.41  
45 $662.64 $7,289.05  
46 $728.90 $8,017.95  
47 $801.80 $8,819.75  
48 $881.97 $9,701.72  
49 $970.17 $10,671.90  
  
  
Would you like to do another? (NO=0, YES=1)  
0  
  
 ----jGRASP: operation complete.  
