Lab #03

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CPSC 1150 - 003

Instructor: H. Darbandi

Lab Title: Learning Loops and Nested-Loops

Date Completed: June 1, 2020

Department: CSIS

Program Loops and Nested-loops

File Name: Lab3.java

Purpose: 2A: Develop an algorithm in pseudocode and a program to determine how long it will take to deplete a bank account with an initial balance.

2B: Develop a triangle using user inputted numbers from 1 to 9.

Technical Information:

(You should fill the following information based on compiler and computer you are using).

Compiler: Java SDK version 14

Computer: AMD Ryzen 5 2600 3.40 GHz, 16 GB ram, 64-bit processor, Java SDK 14

Operating System: Windows 10

Language: Java

Program Logic (Pseudocode)

Algorithm: Determine how long it would take to deplete a bank account with an interest rate of 6% per year, taking out $500 per month.

**START**

**Calculate Time to Deplete Bank Account**

1. Check if the balance is over a specific amount (ie, 100,000) and ask the user to enter a new value as large values would take very long to calculate at the given withdrawal rate of $500 per month.
2. While the balance is greater than 0
   1. Iterate the months up by 1
   2. Calculate the new balance with monthly interest
   3. Withdraw the amount designated by *final static double* ***withdraw***
3. Once the balance is completed, print out the message on how long it’ll take to deplete the account.
   1. If the number of months is less than 12, print that it’ll take x number of months to deplete.
   2. Otherwise, that means that the number of months is greater than 12, and therefore needs to be calculated into years as well.
      1. The value for years is a truncated integer value of months divided by 12.
      2. The value for new months is the REMAINDER integer value of months MODULO 12.
      3. Print out the message once calculated.

**Create a Triangle**

1. Accept user input from values 1 to 9
2. First for loop (starts at 1, ends at the value that the user inputted, iterates by one) for the row
   1. Create second for loop inside the first for loop, and have it start at 1 and be less than the current value of the first for loop iterator.
   2. Print out the value.
   3. Repeat for each row and column in the triangle

**END**

Generate your test cases based on the specifications in your lab assignment. Follow following format for each test case: (Refer to external document of your previous lab)

*purpose*

*input*

*output*

*expected value*

*passed or failed*

**Test Cases:**

**Calculate Time to Deplete Bank Account**

**Test Case 1:**

Inputs:

500

Expected value: 2 months

Output: 2 Months

Passed.

**Test Case 2:**

Inputs:

400

Expected Value: 1 Month

Output: 1 Month

Passed

**Test Case 3:**

Inputs:

30000

Expected Value: 6 years

Output: 6 years

Passed

**Test Case 4:** Discriminant is 0

Inputs:

80000

Expected Value: 26 years and 11 months

Output: 26 years and 11 months

Passed

**Triangle**

**Test Case 1:**

Input:

1

Expected Value: 1

Output: 1

Passed

**Test Case 2:**

Input:

8

Expected Value:

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

1 2 3 4 5 6

1 2 3 4 5 6 7

1 2 3 4 5 6 7 8

Output:

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

1 2 3 4 5 6

1 2 3 4 5 6 7

1 2 3 4 5 6 7 8

Passed