**PROJECT Bank account simulator program 100 points**

**Objective** To write a program that performs various bank transactions.

***PROJECT DESCRIPTION***

Bank of IIT has contacted you to write, compile and execute a complete program that creates bank account information and executes various transaction details for their clients.

Your program will prompt users for options such as creating an initial balance, entering deposits or withdrawals. Also, your program will allow for the printing of account information including interest at various interest rates.

Use loops, user defined methods, conditional and relational logic and the basics of OOP to accomplish the objectives of this program.

Error trapping will be part of your grade so don’t forget to include some basic error trapping logic! Comment your code thoroughly as well for maximum points.

***Project Details***

For this program you will create *two* separate Java files within your package, namely **AccountHolder** and **AccountHolderTest**.

The **AccountHolder** file must include the following class *field* members and data *methods* to allow for transaction processing.

|  |  |
| --- | --- |
| Field Name | Field modifier/type |
| annualInterestRate | static / double |
| balance | double |

|  |  |  |  |
| --- | --- | --- | --- |
| \*Method Name | Method (Instance or Static) | Argument | Return Type |
| AccountHolder | Constructor | double | none |
| deposit | Instance | double | void |
| withdrawal | Instance | double | void |
| monthlyInterest | Instance | void | void |

\*assume all methods are declared public

*Of course if you would like to add any extra fields or methods in your class(es) feel free*

*to do so.*

Coding detail for your methods must include the following:

1. Allow the **Constructor** to accept an argument representing an initial balance for the Account holder. Set your balance member equal to the value passed via the class constructor. Balances cannot start off negative! Include an error message if this is the situation.
2. Define in your **monthlyInterest** method body an assignment statement to update the account holders’ **balance** to be effected as follows:

**balance += balance \* (annualInterestRate / 12.0);**

1. For your **deposit** & **withdrawal** methods either have your method body either increase or decrease the holder’s current balance accordingly.

An added rule to follow here:

Disallow a withdrawal attempts to drive account balance to drop below $50. Deliver a message to the console stating that the balance must hold to at least $50.

For your **AccountHolderTest** file, include any local variables in main to work the application. Include the following transactional detail from your main method for each run below, *executed* in the **following order.**

Your main() activities

1. Allow the interest for the bank to be initially set at **4%**. This can be hard coded in.
2. Create an AccountHolder object and prompt the user for an initial account balance and have the initial balance passed into the **AccountHolder** constructor.
3. Prompt the user to enter in a deposit amount.
4. Prompt the user for a withdrawal amount.
5. Display an ending balance, including added monthly interest, to the account holder.

Sample snapshot run

A screenshot of a cell phone

Description automatically generated

Include two runs of your application. One run should not have a balance to go below $50 and a second run that has a balance that reaches the limit of $50 and thus your message triggers stating the balance must hold at least to $50.

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After you fully have tested your app, modify your program output to display the current date and time and your name at the end of your output (as shown above). To do so include the following code:

String timeStamp = **new** SimpleDateFormat("yyyy/MM/dd HH:mm:ss").format(Calendar.*getInstance*().getTime());

System.***out***.println("Cur dt=" + timeStamp + "\nProgrammed by Sammy Student\n");

Make sure to change to your name as Programmer.

You will need to import in the following to allow for the methods to be acceptable.

**import** java.text.SimpleDateFormat;

**import** java.util.Calendar;

Note you can always go to your menu and choose **Source>Organize Imports** to automatically include the necessary import statements for your program application!!!

***Please include this code to print the date and time plus your name for all your labs herein including your final project as well****.*

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Extra Credit!

Display in a columnar format, a report showing interest being added to the users current account balance amount over a period of 12 months.

Have one column display the month number and one column to show the respected new calculated balance for each particular month. Label your column headings appropriately.

A sample display showing new balances for a twelve month period. Note- included in the display is the word ‘Base’ to depict what the current balance is in the account as a starting point.

A screenshot of a computer

Description automatically generated

Submit to Canvas your two snapshots of your sample runs given the specifications above and paste them into a Word doc file for credit. Include also your Extra Credit snapshot if applicable. Label your snapshot as ‘Extra Credit’. Include a copy of your actual source code (no snapshots) into the same word document file as well. Include a program description in your code. Label your file accordingly. Ex. **ITMD\_510\_Lab1\_yourInitials.docx**.