CSE 101 Programming Assignment 2

Due:
> Sunday, 21-November-2021 by 23:59

Deliverables:
> The following Java file should be submitted to MS Teams by the due date and time specified above. Submissions received after the deadline will be subject to the late policy described in the syllabus.
> - ATM_{StudentNumber}.java

Specifications:

Overview: You will continue your program this week to maintain the account balance for a user of an ATM. Do not forget your headers with @author and @version information. This program will be expanded in future weeks, so be sure you understand the concepts covered in this program.

> **Requirements**: Write a program that will simulate the user interface for an ATM. It will allow the user to select one of four (4) options:
> 1. Display Balance
>   a. Should display to the user the amount remaining in his/her account.
> 2. Deposit Money
>   a. Adds to the balance the amount deposited
>   b. Should verify the amount is valid (as described below)
> 3. Withdraw Money
>   a. Removes the amount from the balance
>   b. Should verify the amount is valid (as described below)
> 4. Exit

> To facilitate the execution of this program, you will write (at minimum) the following methods:
> 1. main()
>   a. A method to run the atm program
>   b. It will ask the user for three parameters representing the name, surname, and starting balance for the customer.
>   c. It will then run according to the description until the user types "0" or an invalid value (display a message before exiting for invalid values)
>   d. Returns None
> 2. isDepositValid(amount)
>   a. A method to verify the deposit is valid
>   b. Takes one double type parameter for the amount entered
>   c. Returns a boolean
>   i. True if amount is positive
>   ii. False for all other values

    3. isWithdrawalValid(balance, amount)
- a. A method to verify the withdrawal is valid
- b. Takes two double type parameters for the current balance and the amount to be withdrawn
- c. Returns a boolean
    - i. True if amount is positive and less than or equal to balance
    - ii. False for all other values

    4. moneyGiven(amount)
- a. A method to determine the type of bills and coins to be given
- b. Takes one parameter for the amount to be given
- c. Returns a String containing the number of each type of bill in the format of "# - Type" (i.e. "2 – 20", "3 – 1"), each on a separate line.
    - i. The values tested will be standard TL types (200, 100, 50, 20, 10, 5, 1, 0.50, 0.25, 0.10, 0.05, 0.01)

    5. Any other methods you feel helpful can be implemented, however, these will be the only methods tested.

Design:

When validDeposit is called with the given parameters, the following values should be returned:

```
ATM_123456789.isDepositValid(200)
true
ATM_123456789.isDepositValid(-200)
false
```

When validWithdrawal is called with the given parameters, the following values should be returned:

```
ATM_123456789.isWithdrawalValid(500, 200)
true
ATM_123456789.isWithdrawalValid(500, 2000)
false
ATM_123456789.isWithdrawalValid(500, -200)
false
```

When the method moneyGiven is called with the following values, the returned String should be one of these shown.

```
ATM_123456789.moneyGiven(386.86)
1 - 200
1 - 100
1 - 50
1 - 20
1 - 10
1 - 5
1 - 1
1 - 0.50
1 - 0.25
1 - 0.10
1 - 0.01
ATM_123456789.moneyGiven(290)
1 - 200
1 - 50
2 - 20
```

```
ATM_123456789.moneyGiven(386.86)
1 - 200
1 - 100
1 - 50
1 - 20
1 - 10
1 - 5
1 - 1
1 - 0.50
1 - 0.25
1 - 0.10
0 - 0.05
1 - 0.01
ATM_123456789.moneyGiven(290)
1 - 200
0 - 100
1 - 50
2 - 20
0 - 10
0 - 5
0 - 1
0 - 0.50
0 - 0.25
0 - 0.10
0 - 0.05
0 - 0.01
```

When run, your program should ask the user for his/her name, surname and beginning balance, then greet the user and process their requests. An example is given below (note that the program changes the surname to all uppercase letters):

```
Please enter your first name >> Joseph
Please enter your surname >> Ledet
Please enter your starting balance >> 1000

Hello Joseph LEDET
What would you like to do today?
1 for Account Balance
2 for Cash Deposit
3 for Cash Withdrawal
0 to quit
Please enter your selection >> 1
Your account balance is 1000.0

Hello Joseph LEDET
What would you like to do today?
1 for Account Balance
2 for Cash Deposit
3 for Cash Withdrawal
0 to quit
Please enter your selection >> 2
How much are you depositing? 200

Hello Joseph LEDET
What would you like to do today?
1 for Account Balance
2 for Cash Deposit
3 for Cash Withdrawal
0 to quit
```

```
Hello Joseph LEDET
What would you like to do today?
1 for Account Balance
2 for Cash Deposit
3 for Cash Withdrawal
0 to quit
Please enter your selection >> 3
How much are you withdrawing? 300
You will receive the following:
1 - 200
1 - 100


Hello Joseph LEDET
What would you like to do today?
1 for Account Balance
2 for Cash Deposit
3 for Cash Withdrawal
0 to quit
Please enter your selection >> 1
Your account balance is 900.0

Hello Joseph LEDET
What would you like to do today?
1 for Account Balance
2 for Cash Deposit
3 for Cash Withdrawal
0 to quit
Please enter your selection >> 0
Thank you for using our ATM. Have a nice day!
```

If the user enters invalid values, the program should display a message saying that the value is not acceptable. If an invalid starting balance is entered, the program should continue requesting a balance until a valid value is given. If an invalid deposit or withdrawal amount is entered, the program should return to the main menu. If an invalid menu option is entered, the program should display a message and exit. Examples shown:

```
Please enter your first name >> Joseph William
Please enter your surname >> Ledet
Please enter your starting balance >> -100
ERROR: Invalid balance
Please enter your starting balance >> 100

Hello Joseph William LEDET
What would you like to do today?
1 for Account Balance
2 for Cash Deposit
3 for Cash Withdrawal
0 to quit
Please enter your selection >> 2
How much are you depositing? -30
ERROR: Invalid deposit amount

Hello Joseph William LEDET
What would you like to do today?
1 for Account Balance
2 for Cash Deposit
3 for Cash Withdrawal
0 to quit
Please enter your selection >> 3
How much are you withdrawing? 200
ERROR: Invalid withdrawal amount

Hello Joseph William LEDET
What would you like to do today?
```

```
Hello Joseph William LEDET
What would you like to do today?
1 for Account Balance
2 for Cash Deposit
3 for Cash Withdrawal
0 to quit
Please enter your selection >> 1
Your account balance is 100.0

Hello Joseph William LEDET
What would you like to do today?
1 for Account Balance
2 for Cash Deposit
3 for Cash Withdrawal
0 to quit
Please enter your selection >> 5
Invalid choice. Exiting System.
```

Code: Create variables for the various values entered by the user and assign it using the Scanner object. As a user enters valid values for depositing and withdrawing money, update the balance variable accordingly.

Test: You are responsible for testing your program. It is important to not rely solely on the examples presented in this Project description.

Grading:

MS Teams Submission: You can submit multiple times, however, we will only grade the last version that you submitted.

NOTE: If you use System.exit() in your code, you will automatically **receive 0 points** for this assignment.

Quiz: There will be a quiz based on this assignment given on 26-November at 08:40 on MS Teams and in lab. The result of this quiz will be used to determine your grade on this assignment. **Note**: if you do not submit the quiz, your score on this assignment **will be 0**.