Computer Science 121 – Fall 2019
Project 4: String Manipulations, Loops, and Methods
Deadline: Friday, November 15, (midnight) in e-campus.

1- **Objectives:** This assignment will test your understanding of string, loops and methods.
2- **Description:** Write a well-commented bank account ATM program with the menu options

   1) Show Balance
   2) Deposit
   3) Withdraw
   4) Update password
   5) Exit

The program should keep on displaying the menu options until the user enters 5.

Implement each menu option with **appropriate methods**. In the main method, the program should call appropriate methods based on the options (you must not write everything in the main method). For example, if the user enters option 1, then the program will call the method showBalance that will actually show the balance for the account.

Since an account have a balance amount and a password, it makes sense to declare them at class level as variables and modify them from the methods.

Inside the class, before the main method, you can define then as shown below in the code fragment:

```java
import java.util.Scanner;

public class RaiBankAccount {
    static double balance; //total balance of the account
    static String password = "default"; //password for the account
    static Scanner sc =new Scanner(System.in); //since we use Scanner multiple times, we can
                                    //use it here as well and using sc where ever necessary


    public static void main(String[] args) {
```

1) **Show balance:** Prints the total balance on the screen (Define it as a method to print the global variable balance)

2) **Deposit:** Prompts user to enter the amount to deposit. After deposit is complete prints the balance on the screen.
   - If the amount deposited is less than 0 prompt to enter again.

   (Define it as method where you add a user entered amount to the *balance*)

3) **Withdraw:** Prompts user to enter the amount to withdraw. After deposit is complete prints the balance on the screen.
   - If resulting balance will be less than 0 don't allow the operation and print error message.
   - If the amount to be withdrawn is less than 0 print error message

     (Define it as method, do while or while loops will be useful here)

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4) **Update password:** Prompt user to enter the old password (set the initial password to be "default").
- If the entered password is incorrect mention that it is invalid password and go to the start of the menu.
- If the old password is correct, then prompt for new password. Check if it satisfies the following
  o Have at least 8 characters
  o Contains only letters and digits
  o contains at least 2 digits
- If satisfies, update the password, otherwise print error message.
  (Implement this in a method, here it might be useful to define and use other methods for testing the validity of the password. For example, define a new method that check if the string contains only letters and digits and use it here)
5) **Exit:** Exit the program, print out a message.
6) **Main method:** It should have a loop that continuously displays the options and invokes the appropriate methods or exits the program.

Submission: Through your ecampus account (ecampus.wvu.edu). Your file needs to be named as **yourLastNameBankAccount.java**

Here is an example run:

```
> run BankAccount
Welcome to the bank of CS121
Enter one of the options (1-5):
 1.Show Balance
 2.Deposit
 3.Withdraw
 4.Update Password
 5.Exit
 2

Enter amount (>0) you want to deposit: $
 -500

Please enter a positive amount to deposit
Enter amount (>0) you want to deposit: $
 4500

Your current balance is: $4,500.00
Enter one of the options (1-5):
 1.Show Balance
 2.Deposit
 3.Withdraw
 4.Update Password
 5.Exit
 3

Enter amount (>0) you want to withdraw: $
 -50

Enter amount (>0) you want to withdraw: $
 -50000

Enter amount (>0) you want to withdraw: $
 500000

The remaining amount is less than 0. Please enter different amount:
 60

Your current balance is: $4,440.00
```

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```
Enter one of the options (1-5):
 1.Show Balance
 2.Deposit
 3.Withdraw
 4.Update Password
 5.Exit
 4
Enter the current password:
 dontknow
Invalid password. Try again later.
Enter one of the options (1-5):
 1.Show Balance
 2.Deposit
 3.Withdraw
 4.Update Password
 5.Exit
 4
Enter the current password:
 default
Enter new password:
 4567gt
Password must be at least 8 characters long
Enter new password:
 6765544
Password must be at least 8 characters long
Enter new password:
 45@4543g
Password must contain at least 2 digits and only contains digits and numbers
Enter new password:
 ADSDEE2e
Password must contain at least 2 digits and only contains digits and numbers
Enter new password:
 newpassword123
Password changed to: newpassword123
Enter one of the options (1-5):
 1.Show Balance
 2.Deposit
 3.Withdraw
 4.Update Password
 5.Exit
 5
Good Bye! Plese come again!
```

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Grading rubric for reference (Rubric might be modified on instructors' requirements):

item	Grading criteria (Check rubric for grading score)	Max points
1	Comments at the beginning and throughout the program	5
2	Java syntax is correct (class names starting with capital letter, variable names starting with small letter, indentations etc.)	5
3	Efficiency (There is no redundant code)	5
4	Show Balance	5
5	Proper and continuous display of menu	10
6	Deposit	10
7	Withdraw	10
8	Update Password	10
8a	Check If password have at least 8 chars	5
8b	Check if password contains only letters and digits	5
8c	Check if password contains at least 2 digits	5
9	Correctly Exit, print message	5
10	Check Invalid inputs	10
11	Overall execution	10
	Total	100
	Comments	

Note: If your program doesn't compile correctly, it will be rejected and not graded.