CST8110 - Introduction to Programming

Assignment #4 – Using Classes

DUE: on Monday November 23rd at 11pm sharp. See Submission requirements below.

Problem Description:

- This program will model a basic bank activity. The program will present the user with a menu of options to create a new client – each client will have a savings account and a chequing account; allow deposits to savings or chequing account for that client; and allow withdrawals to savings to chequing account for that client.
- The next upgrade (but is not required for this assignment) would be to keep a "database" of all clients…but for now, we will deal with one client at a time!
- The client information will consist of a name, and two accounts – a savings account and a chequing account.
- An account consists of an account number (5-digit number) and a balance.
- The program should validate all numeric input as much as possible (except if chars are entered instead of numerics – this does not need to be handled), and you should display all output with 2 decimal places.

***Sample Output :** (**bold italics** indicated user entered information)*

```
Enter 1 to create new client, 2 to display client information, 3 to deposit
        money, 4 to withdraw money , 5 to quit: 1
    Enter client name:     Linda Crane
    Enter savings account info:
         Account number:  11111
         Account balance:  100.00
    Enter chequing account info:
         Account number:   22222
          Account balance:  200.00
Enter 1 to create new client, 2 to display client information, 3 to deposit
        money, 4 to withdraw money , 5 to quit: 2
    Client:  Linda Crane
        Account:  11111    $100.00
       Account:  22222    $200.00
Enter 1 to create new client, 2 to display client information, 3 to deposit
        money, 4 to withdraw money , 5 to quit: 3
     Enter 1 for savings account, 2 for chequing account:  1
      Enter amount to deposit:   10.00
       Deposit completed.
Enter 1 to create new client, 2 to display client information, 3 to deposit
        money, 4 to withdraw money , 5 to quit: 4
   Enter 1 for savings account, 2 for chequing account:  2
     Enter amount to withdraw:   220.00
     Invalid withdraw amount – you do not have that much in this account.
Enter 1 to create new client, 2 to display client information, 3 to deposit
        money, 4 to withdraw money , 5 to quit: 4
   Enter 1 for savings account, 2 for chequing account:  2
      Enter amount to withdraw:   20.00
       Withdrawal completed completed.
Enter 1 to create new client, 2 to display client information, 3 to deposit
        money, 4 to withdraw money , 5 to quit: 2
   Client:  Linda Crane
        Account:  11111    $110.00
       Account:  22222    $180.00
```

Solution Details:

- Write (and test) a BankAccount class which will model bank account (to be demonstrated as Lab #7)
  - Data fields:
    - accNumber – int – 5 digits
    - accBalance – float (or double)
  - Methods:
    - default constructor – default to 0 values
    - initial constructor - set account number and balance to parameters pass in
    - createAccount – prompt user for input from keyboard for valid account number and balance
    - deposit – deposit amount as parameter, deposit amount added to balance
    - withdraw – withdrawal amount as parameter, withdrawal amount subtracted from balance if there's enough money in balance; returns boolean value true or false indicated whether withdrawal was successfully completed
    - display – displays account number and balance
    - returnBalance – returns balance value through return value

- Then, write (and test) a Client class which will model the client
  - Data fields:
    - name – String object
    - savingsAccount – BankAccount object
    - chequingAccount – BankAccount object
  - Methods:
    - default constructor –
    - createClient – prompt user for input from keyboard for name, then call the createAccount methods on BankAccount objects
    - deposit – prompt user to enter which BankAccount (1 for savings, 2 for chequing), then prompt user for deposit amount, then call deposit method on appropriate account object passing deposit amount in parameter list
    - withdraw – prompt user to enter which BankAccount (1 for savings, 2 for chequing), then prompt user for withdrawal amount, then call withdraw method on appropriate BankAccount object passing withdrawal amount in parameter list
    - display – displays client name and account number and balance for each account

- Write the actual solution to the problem (in a BankMachine class) which contains method main … and declares a object of Client class, and executes the menu/methods as appropriate.

Submission Requirements: TO YOUR LAB TEACHER

- Paper submission should include
  - cover page (including student name, student number and lab section);
  - hand-written (legibly) or typed and printed test plan;
  - printout of all .java files.
- Electronic submission of .java and .class files through Lab Blackboard course to your lab teacher.