Assignment#2, CSI 212, Fall 2016
Object-Oriented Programming Lab

Today's Topics

- Class and Object
- Initialization of fields.
- Constructor
- Flow Controls: If, While, For, Do-While
- Passing input to main method.
- Array

Problems/Assignments

Problem#1

Create a Banking System, where a user can create new account, deposit money, withdraw money and check the balance
What you need to do:

1) Create a **BankAccount** class which has **3 instance variables**; name, id and balance. It has a **constructor** that takes initial value for those 3 attributes and initializes those attributes. The class also has the **following 4 methods**;

   a. void deposit(double depAmount)
   - inside the method the balance need to be increased by the "depAmount" amount.
   b. void withdraw(double withAmount)
   - the balance is decreased by "withAmount" amount. We have to make sure the balanced do not become negative.
   c. double getBalance()
   - the method returns the balance.
   d. void display()
   – this method displays the attributes in the format "Name:[name]; Id: [id]; Balance:[balance]".

2) Now create another class **Bank** and implement the **main** method. In main method do the following.
   a. create an object of the BankAccount class
   b. withdraw some money
   c. display the balance
   d. deposit some money
   e. display the balance

Problem#2

a) Write a Java program that will go through the items of an **array** and find the **max** and **min** value. Take the following values as the input of the array

   {2, 3, 9, 8, 13, 1, 5, 19, 15, 0, 4}

b) Now modify the code so that instead of using array, you will pass those values as argument of main method.
   You need to use *Integer.parseInt(String)* method to convert the String to Integer.

Problem#3 Option#1

a) Write a Java program that will display the first n Fibonacci sequence. You need to pass the n as an argument of main method
b) Write a Java program that will display if the user input is an even number or odd. Use main method's argument for user input.

Problem#3 Option#2(Submit as assignment)

1) Write **a Java class** that will work with numbers. The class has one property "num" of type int. The class will have different methods to display the following
   a. One method ***showFibonacci()*** will display the Fibonacci sequence. The method will display first "num" numbers of the Fibonacci sequence.

      The **Fibonacci Sequence** is the **series** of **numbers** (0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ...) where the next **number** is found by adding up the two **numbers** before it. Take the first 2 numbers as 0, 1;

   b. Another method ***showPyramid()*** will display the number pyramid as below. It will display the first "num" lines. If "num" is greater than 9, you have to display 9 lines. Don't hard code the values, use logic.

```
                1
              1 2 1
            1 2 3 2 1
          1 2 3 4 3 2 1
        1 2 3 4 5 4 3 2 1
      1 2 3 4 5 6 5 4 3 2 1
    1 2 3 4 5 6 7 6 5 4 3 2 1
  1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8 9 8 7 6 5 4 3 2 1
```

   c. 3rd method ***checkNumber()*** will check if a number is even or odd. This method will return true if the number is even, false otherwise.

   d. 4th method setNum(int) will set the value of "num" variable

Numbers

private int num
void showFibonacci() *void showPyramid()* *boolean checkNumber()* *void setNum(int)*

2) Now write **another class** that will have the **main** method. From the main method, do the following.
    a. Create an instance of the class with "*num*" variable set to last digit of your ID.
    b. Call *showFionacci(), showPyramid() and checkNumber()*.
    c. Now using *setNum()* method, set the "*num*" variable to last 2 digit of your Id.
    d. Do step#b again.

Problem#4

Declare a 2 dimensional **String** array of size 3x4. Assign value to each item in the array in the format of [row number][column number], where both row and column number starts at 0. Use any loop statement to assign those value. Now iterate through each row and column and display the array in following format.

```
| 00 01 02 03 |
| 10 11 12 13 |
| 20 21 22 23 |
```

Problems/Assignments for practice

1) Write a java program to create a class name **BankAccount**. The BankAccount class has 3 instance variables/attributes: ***name, id*** and ***balance***. It has a ***constructor*** that takes initial value for those 3 attributes and initializes those attributes. The class also contains a method called "***display***" which displays the attributes in the format "Name:[name]; Id:[id]; Balance: [balance]".
   Now **create another class called BankAccountArray** which will contain the ***main*** method. Declare an array of type BankAccount and size of 4. Assign the 4 items as below and then call the display method for each item of the array (use loop and length property).

   [0] = BankAccount object with attributes name = "Nazrul Islam", id = 1234, balance = 20000
   [1] = BankAccount object with attributes name = "Rizvi Mahmud", id = 2345, balance = 2000
   [2] = BankAccount object with attributes name = "Rizwana Khan", id = 3456, balance = 3000
   [3] = BankAccount object with attributes name = "Anwar Hossain", id = 4567, balance = 1000

2) Write a Java program that will sort an array in ascending or descending order. Use main methods argument to read user input.