PROGRAMMING PROJECT 3

1. Formatting Output

Write an application that creates and prints a random phone number of the form XXX-XXX-XXXX. Include the dashes in the output. Do not let the first three digits contain an 8 or 9 (but don't be more restrictive than that), and make sure that the second set of three digits is not greater than 742. Use either the *random* method in the *Math* class or the methods in the *Random* class.

Deliverables

- A printout of the complete program and the final execution.

2. Nested Panels

Write a complete java program that displays three panels horizontally in a window that has yellow background. The first panel is colored with cyan and the label is centered with the test positioned by the default. The second panel is colored with red and the label is centered with the text positioned at left center. The third panel is colored with blue and the text is positioned at right bottom. Set the size of the panels to 150 by 100. You can replace the devil icon with any image have.

Example screen:

Deliverables

- A printout of the complete program and the screenshot of the window.

3. A Bank Account Class

1. File *Account.java* contains a partial definition for a class representing a bank account. Save it to your directory and study it to see what methods it contains. Then complete the Account class as described below. Note that you won't be able to test your methods until you write ManageAccounts in question #2.

    a. Define class variable of *balance*, *name*, and *accNum*. This requires defining an appropriate visibility and data type for each variable.
    b. Fill in the code for method *toString*, which should return a string containing the name, account number, and balance for the account.
    c. Fill in the code for method *chargeFee*, which should deduct a service fee from the account.
    d. Modify *chargeFee* so that instead of returning void, it returns the new balance. Note that you will have to make changes in two places.
    e. Fill in the code for method *changeName* which takes a string as a parameter and changes the name on the account to be that string.

2. File *ManageAccounts.java* contains a shell program that uses the Account class above. Save it to your directory, and complete it as indicated by the comments.

3. Modify ManageAccounts so that it prints the balance after the calls to chargeFees. Instead of using the getBalance method like you did after the deposit and withdrawal, use the balance that is returned from the chargeFees method. You can either store it in a variable and then print the value of the variable, or embed the method call in a println statement.

4. Draw a UML class diagram and sequence diagram. Must be drawn by computer-aided tools.

Deliverables

- A printout of the complete program and the final execution.
- The UML class diagram and sequence diagram from question 4.

```
//*******************************************************
// Account.java
//
// A bank account class with methods to deposit to, withdraw from,
// change the name on, charge a fee to, and print a summary of the
account.
//*******************************************************

public class Account
{
  //-----------------------------------------------
  // Defines class variables
  //-----------------------------------------------


  //-----------------------------------------------
  //Constructor -- initializes balance, owner, and account number
  //-----------------------------------------------
  public Account(double initBal, String owner, long number)
  {
    balance = initBal;
    name = owner;
    acctNum = number;
  }

  //-----------------------------------------------
  // Checks to see if balance is sufficient for withdrawal.
  // If so, decrements balance by amount; if not, prints message.
  //-----------------------------------------------
  public void withdraw(double amount)
  {
    if (balance >= amount)
       balance -= amount;
    else
       System.out.println("Insufficient funds");
  }

  //-----------------------------------------------
  // Adds deposit amount to balance.
  //-----------------------------------------------
  public void deposit(double amount)
  {
    balance += amount;
  }

  //-----------------------------------------------
  // Returns balance.
  //-----------------------------------------------
  public double getBalance()
  {
    return balance;
  }


  //-----------------------------------------------
  // Returns a string containing the name, account number, and balance.
  //-----------------------------------------------
```

```
  public String toString()
  {

  }

  //-----------------------------------------------
  // Deducts $10 service fee
  //-----------------------------------------------
  public void chargeFee()
  {

  }

  //-----------------------------------------------
  // Changes the name on the account
  //-----------------------------------------------
  public void changeName(String newName)

  {

  }
}

// ********************************************************************
//   ManageAccounts.java
//
//   Use Account class to create and manage Sally and Joe's
//   bank accounts
// ********************************************************************

public class ManageAccounts
{
    public static void main(String[] args)
    {
      Account acct1, acct2;

      //create account1 for Sally with $1000
      acct1 = new Account(1000, "Sally", 1111);

      //create account2 for Joe with $500

      //deposit $100 to Joe's account

      //print Joe's new balance (use getBalance())

      //withdraw $50 from Sally's account

      //print Sally's new balance (use getBalance())

      //charge fees to both accounts

      //change the name on Joe's account to Joseph

      //print summary for both accounts

    }
}
```

DELIVERABLES

Submit to lab assistant both a softcopy and a hardcopy of the following items.

- A cover page with the project number, due date, and the names of your Project Team Members.
- Deliverables from the exercise 1, 2, and 3.
- This page, with the appropriate signature and date, indicating that the project has been completely and correctly demonstrated in lab.

LABORATORY SIGNATURE

PROJECT TEAM MEMBERS:

STUDENT NAME _____

STUDENT NAME _____

STUDENT NAME _____

_____ _____

LAB INSTRUCTOR SIGNATURE **DATE**