Name: MD Abir A. Choudhury

NOTE: I ignored user-error given time for most problems

I. Give the values of the following expressions, or state if it's illegal.

```
String a, b, c, d;
a = "Cloud Computing!";
b = "  Algorithms  ";          (there is one space before and one space after the word)
c = "04 Mars 2013";
d = "a";
```

1 **9**		c.indexOf("0",2)
2 **true**		a.startsWith("Cloud C")
3 **Computing!**		a.substring(c.lastIndexOf('r'))
4 **false**		a.substring(6,9).equals("com")
5 **04 Mars 201312Cloud Computing!**		c+b.length() + a
6 **illegal**		d.equalsIgonreCase("A")

II. Find the output of the java code below? What do you think the programmer intended the code to do, and how would you fix it?

```
int sum = 0;
int product = 1;
int max = 20;
for (int i = 1; i <= max; i++)
sum = sum + i;
product = product * i;
System.out.println("The sum is " + sum +" and the product is " + product);
```
Output:
error: cannot find symbol
    product = product * i;
symbol: variable i
Intention:
The programmer wanted to display the total sum of numbers from [1,20] and display the product of 'i' times the current value of product in the console.
Solution:
Since the error would be an invalid variable "i," I would first try to solve that problem by placing squiggly braces around the for loop as follows:
```
        for (int i = 1; i <= max; i++){
            sum = sum + i;
            product = product * i;
        }
```
Then I would change the data type of product because by the time 'i' equals 20 in the for loop, the value of product will be too large to display in the console, so I would change the data type from int to double. This way the output would be something like this:
```
        The sum is 210 and the product is 2.43290200817664E18
```

III. Write a Java GUI application that computes the cost of flowers sold at a flower stand. Five kinds of flowers—petunia, pansy, rose, violet, and carnation— are stocked and cost, respectively, 50¢, 75¢, $1.50, 50¢, and 80¢ per flower. Create an array of strings that holds the names of these flowers. Create another array that holds the cost of each corresponding flower. Your program should read the name of a flower and the quantity desired by a customer. Locate the flower in the name array and use that index to find the cost per stem in the cost array. Compute and print the total cost of the sale.

```java
import javax.swing.*;
import java.lang.String;
import java.text.*;


class Question3{
    public static void main(String[] args) {
        // create the array to store the flower names
        String[] flowers = new String[] {"Petunia", "Pansy", "Rose", "Violet", "Carnation"};
        // create the other array to store prices of flowers
        Double[] costOfFlowers = new Double[] {.5, .75, 1.5, .5, .8};

        // output to display the options of flowers and take in the flower name
        String userInput = JOptionPane.showInputDialog("Choose a flower from the following
list:\n"
                                            + "Petunia\n"
                                            + "Pansy\n"
                                            + "Rose\n"
                                            + "Violet\n"
                                            + "Carnation");

        // lowercase everything first
        userInput = userInput.toLowerCase();
        // capitalize the first letter of the user input
        userInput = userInput.substring(0,1).toUpperCase() + userInput.substring(1);
        // output option to take in user quantity
        int quantity = Integer.parseInt(JOptionPane.showInputDialog(null, "Input the quantity of
those flowers you want"));

        double totalCost = 0.0;
        // find the flower in the array
        for(int i = 0; i < 5; i++) {
            // if the userinput is the same in the array, then find the correlated cost and
compute the total cost of flowers
            if(flowers[i].equals(userInput)) {
                // compute the totalcost
                totalCost = quantity * costOfFlowers[i];
            }
        }

        // format to currency
```

```
            NumberFormat formatterDouble = NumberFormat.getCurrencyInstance();
            // output the totalcost of the sale
            JOptionPane.showMessageDialog(null, "The total cost of the sale is: " +
        formatterDouble.format(totalCost));
            }
        }
```

IV.   Write a Java Console applications that asks the user repeatedly to enter an integer
      between 1 and 10. The program should display a triangle that contains numbers. It
      displays 1 on the first row, 1 and 2 on the second, 1, 2, and 3 on the third row and so
      on...up to the number entered by the user. A Sample Run for n =5 is as follow:

```
1

1 2

1 2 3

1 2 3 4

1 2 3 4 5
```

```java
import java.lang.String;
import java.util.*;

class Question4{
    public static int errorCheck(int num) {
        if(num <= 0 || num > 10) {
            Scanner S = new Scanner(System.in);
            System.out.println("Please input a valid number: ");
            num = S.nextInt();
            errorCheck(num);
        }
        return num;
    }

    public static int printTriangle(int num) {
        num = errorCheck(num);

        // print top half of isoceles triangle
        for(int i = 1; i <= num; i++) {
            for(int j = 1; j <= i; j++) {
                System.out.print(j);
            }
```

```java
                System.out.println();
            }
            return 0;
        }

    public static void main(String[] args) {
        int num = 0;
        // get user input for number between 1 and 10
        do{
            try{
                Scanner S = new Scanner(System.in);
                System.out.print("Enter an integer from 1 to 10 or enter 0 to exit the application:
");
                num = S.nextInt();
                if(num == 0) {
                    System.out.println("You have chosen to exit the application. Closing
Application.");
                    System.exit(0);
                }
                printTriangle(num);
            }
            catch (InputMismatchException e) {
                num = errorCheck(num);
                printTriangle(num);
            }
        } while(num != 0);
    }
}
```

V. Write a Java GUI Application that will ask the user a phrase then it will reverse and display the phrase in the reverse order. Use your own algorithm, you are not allowed to use the reverse method.

Sample Run:

Enter a Phrase: Programming languages is fun

The phrase in reverse order is: nuf si segaugnal gnimmargorP

```java
import javax.swing.*;
import java.lang.String;


class Question5{
    public static void main(String[] args) {
        // ask the user for a phrase
        String phrase = JOptionPane.showInputDialog("Enter a phrase:");
        String reversedPhrase = "";

        // reverse the order of the phrase
        for(int i = phrase.length() - 1; i >= 0; i--) {
            reversedPhrase = reversedPhrase + phrase.charAt(i);
```

```
        }

        // display the phrase in dialog box
        JOptionPane.showMessageDialog(null, "The phrase in reversed order is: " + reversedPhrase);
    }
}
```