COMP 248 - Tutorial #5

Switch & While and Do…While Loops

Question 9: Assume the following fragment of code:

```
Scanner myKeyboard = new Scanner(System.in);
String msg = myKeyboard.next();

int x = 0;
int y = 10;
int z = 100;

switch(msg.charAt(0))
{
   case 'a' :
   case 'b' :
      System.out.println("case 1");
      x = (msg.equals("abc") ? (5 + y++) : (--y + z--));
      break;
   case 'c' :
      System.out.println("case 2");
      y /= 5;
   default:
      System.out.println("default");
}
System.out.println(x + " " + y + " " + z);
```

a) What is the output if the user enters the string: **`abc`**

b) What is the output if the user enters the string: **`aBC`**

c) What is the output if the user enters the string: **`ccc`**

Question 10: Assume the following fragment of code:

```
short age;
double rebate = 0;
boolean isAStudent;
int workExperience;

…

if (age < 10)
```

```
      rebate = 20;
   if (age > 70)
      rebate = 20;
   if (age < 20)
      if (isAStudent)
         if (workExperience > 4)
            rebate = 15;
```

Rewrite the instructions outlined in grey by reducing the number of `if` statements to a minimum.
Your new code should behave exactly as the above code in every possible situation.

Question 1: What is the output of the following?

a)
```
int count = 0;
 while ( count <= 6 )
{
   System.out.print( count + " " );
    count = count + 2;
}
System.out.println(  );
```

b)
```
int count = 7;
 while ( count >= 4 )
{
   System.out.print( count + " " );
    count = count - 1;
 }
 System.out.println(  );
```

c)
```
int i; int j;
boolean again = true;

for (i = 1; i < 5; i++)
{
  again = !again;
  for (j = 1; j < 5; j+=2)
  {
    System.out.print( i + " " + j);
```

```
      if (again)
       System.out.print("-") ;
      else
        System.out.print("*");
      }
      System.out.println();
   }
```

d)

```
   int a = 30;
   int b = 3;

   while (a >= b)
   {
     System.out.println("while " + a + " " + b);
     if ((a%b) == 0)
     {
         a = a/b;
         b++;
     }
     else
     {
         a = a-1;
         b = b-1;
     }
   }
   System.out.println("the end " + a + " " + b);
```

e)

```
   int i, j;
   int n = 5;
   for (i = 1; i <= 5; i++)
   {
       for (j = 1; j <= n-i; j++)
          System.out.print ("-");

       for (j = 1; j <= i; j++)
          System.out.print ("-a");

       System.out.println();
   }
```

f)

```
    int i=5, count=0;
    while (i!=1)
    {
        System.out.println(count + " " + i);
        count++;
        if ((i%2) == 0)
           i/=2;
```

```
     else
        i= 3*i+1;
 }
```

g)
```
int sum = 0;
for (int k = 0; k < 7; k++)
{
    for (int j = 7; j > 2*k; j-=2)
    {
       System.out.print(" " + (j-k) + "+");
       sum += (j-k);
    }
    System.out.println();
}
System.out.println(" = " + sum);
```

h)
```
boolean sign = true;
int sum = 0;
int n = 0;

while (sum < 30)
{
  if (sign)
     sum = sum + n;
  else
     sum = sum – n;
  System.out.print(sum);
  sign = !sign;
  n = n + 10;
}
```

Question 2: Assume the following fragment of code:

```
int age, k = 0;
int low;
int up;
Scanner keyboard = new Scanner(System.in);

System.out.print("Enter lower bound and upper bound:");
low = keyboard.nextInt();
up = keyboard.nextInt();
```

```
for (age = low ; age <= up ; age += 5)
{
   if (age == 25)
      System.out.print("one");
   else if (age == 35 || age == 20)
   {
      k++;
      System.out.print("two");
   }
   else
      System.out.print(age);
   age = age + 5;
}
```

Re-write the instructions outlined in grey by:
replacing the `for` loop by a `do/while` and
replacing the `if` by a `switch`.
Your new code should behave exactly as the above code in every possible situation.

Question 3: Write a program to:

- ask the users for a line of text
- then re-display this line, but with all lower case 'a' 'e' and 'i' in the line replaced by a star ('*').

Your program cannot use the method `replace` from the `String` class.

Here is an example of how your program should behave:

```
Please enter a line of text:
hello Angella Eralli
h*llo Ang*ll* Er*ll*
```

Question 4: Write Java code that uses a do…while loop that prints even numbers from 2 through 10.

Question 5: Write Java code that uses a while loop to print even numbers from 2 through 10.

Question 6: Write Java code that uses a for statement to sum the numbers from 1 through 50. Display the total sum to the console.