

COMP 248 - Tutorial #4 -

Loops

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*ll*o 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.