CSC 204 Lab 9: Looping

Goals
After doing this lab, you should be able to:
• write and trace code with while statements
• use the break statement to exit from a loop
• write and trace code with for statements

Lab Preparation
Read through this lab. Read the material in Chapter 6.

Materials Needed
Be sure you have the following on hand during the lab.
• This sheet and your course notebook.

Method
Copy the Lab 9 files from http://theochem.mercer.edu/csc204.

Tracing Through Programs with Different Input Sets
Included with this lab on your sheet Lab 9 Programs for Tracing, there are a set of eight Java programs we want to trace through using different input sets. First off, let’s start with Loop1.java. Using a trace table and your pencil, we want to trace through it first by hand using the three different input sets which follow. The different input sets are labeled with the letters a, b, c, etc. The output for a program with insufficient input or bad input is described as an abnormal termination.

Show all trace tables and your work in the right margin. Once you’ve traced through a program on all input sets by hand, compile your program, and execute using each of your different input sets. Check the output produced with your results by hand.
### Loop1.java

<table>
<thead>
<tr>
<th>Set a:</th>
<th>Set b:</th>
<th>Set c:</th>
<th>Set d:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input:</td>
<td>Input:</td>
<td>Input:</td>
<td>Input:</td>
</tr>
<tr>
<td>UNIX+++</td>
<td>++++UNIX</td>
<td>U+N+I</td>
<td>UNIX</td>
</tr>
</tbody>
</table>

Output | Output | Output

### Loop2.java

<table>
<thead>
<tr>
<th>Set a:</th>
<th>Set b:</th>
<th>Set c:</th>
<th>Set d:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input:</td>
<td>Input:</td>
<td>Input:</td>
<td>Input:</td>
</tr>
<tr>
<td>UNIX+++</td>
<td>++++UNIX</td>
<td>U+N+I</td>
<td>+U+I</td>
</tr>
</tbody>
</table>

Output | Output | Output

### Loop3.java

<table>
<thead>
<tr>
<th>Set a:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input:</td>
</tr>
<tr>
<td>bw9j4</td>
</tr>
</tbody>
</table>

Output

### Loop4.java

<table>
<thead>
<tr>
<th>Set a:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input:</td>
</tr>
<tr>
<td>bw9j4</td>
</tr>
</tbody>
</table>

Output
Loop5.java

<table>
<thead>
<tr>
<th>Set a:</th>
<th>Set b:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input:</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>UNIX$$</td>
<td>UNIX$$</td>
</tr>
</tbody>
</table>

Output

Loop6.java

<table>
<thead>
<tr>
<th>Set a:</th>
<th>Set b:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input:</td>
<td></td>
</tr>
<tr>
<td>404-555-1212</td>
<td>404</td>
</tr>
<tr>
<td>404</td>
<td></td>
</tr>
</tbody>
</table>

Output

Loop7.java

<table>
<thead>
<tr>
<th>Set a:</th>
<th>Set b:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input:</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Output

Working with an Endless Loop
Compile Endless.java and then run it. Notice how we have an endless loop. Exit the program. Correct this program so that it will print out to the screen the line number message only 10 times in descending order from lines 10 down to 1. Keep your loop as a while loop.

Compile and test your corrections.
Writing Programs With Loops

I. Generating Sequences

Create a program named MyLoops. Within this program, code a while loop which will print out the sequence below. Notice how each term of the sequence is merely two greater than its predecessor.

\[2 \quad 4 \quad 6 \quad 8 \quad 10 \quad 12 \quad 14 \quad 16 \quad 18 \quad 20\]

Once MyLoops is working correctly, copy your source file over to MyLoops2.java. Convert the while loop in this file into a for loop that will produce exactly the same output.

II. Computing Average Sales

Write a program named WalMart which computes the average sales for a given number of Wal-Mart stores at the end of the day.

The user should be prompted for the number of stores, and then the sales for each of these stores with appropriate prompts as seen below. User input is shown in boldface. Notice how the dollar sign is just part of the output prompt. It is not actually being input.

You will need to set up a for loop where the number of stores entered by the user becomes the stop value of the loop. Assume the number of stores will be any positive integer. The store number being printed in the input prompt is actually just your for loop index. Be sure and flush a sum variable to zero before the loop.

<table>
<thead>
<tr>
<th>Number of Stores : 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Store #1 : $1000.00</td>
</tr>
<tr>
<td>Store #2 : $5000.00</td>
</tr>
<tr>
<td>Store #3 : $2250.00</td>
</tr>
</tbody>
</table>

The Average Sales for 3 Wal-Marts was $2750.00.

Be sure and test your program with a different number of stores after you get it working correctly for the above test case.

Deliverables:

E-mail me you completed, working program, as an attachment. The subject of your e-mail should be LAB 9 SUBMISSION – YOUR NAME. The program should be mailed to me by Monday. In addition, this completed document should also be turned in by Monday.
**Loop1.java**

```java
import java.util.*;

public class Loop1 {
    public static void main(String[] args) {
        Scanner stdin = new Scanner(System.in);
        String userInput = stdin.nextLine();
        int index = 0;
        char ch = userInput.charAt(index);

        while (ch != '+') {
            index++;
            ch = userInput.charAt(index);
        }
        System.out.println(ch);
    }
}
```

**Loop2.java**

```java
import java.util.*;

public class Loop2 {
    public static void main(String[] args) {
        Scanner stdin = new Scanner(System.in);
        String userInput = stdin.nextLine();
        int index = 0;
        char ch = userInput.charAt(index);

        while (ch == '+') {
            index++;
            ch = userInput.charAt(index);
        }
        System.out.println(ch);
    }
}```
**Loop3.java**

```java
import java.util.*;

public class Loop3
{
    public static void main(String[] args)
    {
        Scanner stdin = new Scanner(System.in);
        String userInput = stdin.nextLine();

        int index = 0;
        char ch = '\0';

        for (int k = 5;  k <= 7;  k++)
        {
            ch = userInput.charAt(index);
            System.out.print(ch);
            index++;
        }
        System.out.println(ch);
    }
}
```

**Loop4.java**

```java
import java.util.*;

public class Loop4
{
    public static void main(String[] args)
    {
        Scanner stdin = new Scanner(System.in);
        String userInput = stdin.nextLine();

        int index = 0;
        char ch = '*';

        for (int k = 1;  k <= 20000;  k++)
        {
            if (k <= 3)
            {
                ch = userInput.charAt(index);
                System.out.print(ch);
                index++;
            }

        }
        System.out.println(ch);
    }
}
```
**Loop5.java**

```java
import java.util.*;

public class Loop5
{
    public static void main(String[] args)
    {
        Scanner stdin = new Scanner(System.in);
        String userInput = stdin.nextLine();
        int stopValue = Integer.parseInt(userInput);
        userInput = stdin.nextLine();
        int index = 0;
        char ch = '*';
        for (int k = 4; k <= stopValue; k++)
        {
            index++;
            ch = userInput.charAt(index);
            System.out.print(ch);
        }
        System.out.println(ch);
    }
}
```

**Loop6.java**

```java
import java.util.*;

public class Loop6
{
    public static void main(String[] args)
    {
        Scanner stdin = new Scanner(System.in);
        String str1 = stdin.nextLine();
        String str2 = "";
        while (true)
        {
            int i = str1.indexOf("-");
            if (i < 0)
                break;
            str2 += str1.substring(0, i);
            str1 = str1.substring(i + 1);
        }
        System.out.println(str2 + str1);
    }
}
```

**Loop7.java**
import java.util.*;

public class Loop7
{
    public static void main(String[] args)
    {
        Scanner stdin = new Scanner(System.in);
        String userInput = stdin.nextLine();

        int jumpValue = Integer.parseInt(userInput);

        int i;  int count = 0;
        for (i = 1;  i <= 10;  i+= jumpValue)
        {
            if ( i % 2 == 0 )
                break;
            count++;
        }
        System.out.println(count);
        System.out.println(i);
    }
}

Endless.java

import java.util.*;

public class Endless
{
    public static void main(String[] args)
    {
        int line = 10;
        while (line >= 1)
        {
            System.out.println("Line # : " + line);
            line--;
        }
    }
}