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

Set a:	Set b:	Set c:	Set d:
Input:	Input:	Input:	Input:
UNIX++++	++++UNIX	U+N+I	UNIX
Output	Output	Output	

Loop2.java

Set a:	Set b:	Set c:	Set d:
Input:	Input:	Input:	Input:
UNIX++++	++++UNIX	U+N+I	+U+I
Output	Output	Output	

Loop3.java

Set a:
Input:
bw9j4
Output

Loop4.java

Set a:
Input:
bw9j4
Output

Loop5.java

Set a:	Set b:
Input:	
7 UNIX$$$$	3 UNIX$$$$
Output	Output

Loop6.java

Set a:	Set b:
Input:	
404-555-1212	404
Output	Output

Loop7.java

Set a:	Set b:
Input:	
2	3
Output	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  4  6  8  10  12  14  16  19  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.

```
**** PROGRAM TO COMPUTE AVG WAL-MART SALES ****

Number of Stores :  3

Store #1 :  $1000.00
Store #2 :  $5000.00
Store #3 :  $2250.00


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

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

Loop2.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

```
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

```
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

```
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

```
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);
        }
}
```