# Lab 4: Chapter 4, “Conditionals and Loops” SOLUTION

The solutions for each Lab 4 question are listed below. The following exercises are intended to help you apply and practise the concepts introduced in this module. This work is **not** submitted for marks.

Try to answer the questions on paper first. Then insert the code in a Java program to see the actual result.

1. What is wrong with the following code fragment? Will this code compile if it is part of an otherwise valid program? Explain.

if (length = MIN\_LENGTH)  
 System.out.println ("The length is minimal.");

**SOLUTION**

The = assignment operator is used instead of == equality.

In C++, this code would compile and produce the output if MIN\_LENGTH was any value other than zero. In Java, however, you get a compile error for incompatible data types (i.e. not a boolean expression).

1. What output is produced by the following code fragment?

int num = 87, max = 25;  
if (num >= max\*2)  
 System.out.println ("apple");  
 System.out.println ("orange");  
System.out.println ("pear");

**SOLUTION**

apple // since 87 is >= 50

orange // although indented, not part of if

pear

1. What output is produced by the following code fragment?

int limit = 100, num1 = 15, num2 = 40;  
if (limit <= limit)  
{  
 if (num1 == num2)  
 System.out.println ("lemon");  
 System.out.println ("lime");  
}  
System.out.println ("grape");

**SOLUTION**

// lemon is not produced, since 15 is not = 40

lime

grape

1. What output is produced by the following code fragment?

int num = 0, max = 20;  
while (num < max)  
{  
 System.out.println (num);  
 num += 4;  
}

**SOLUTION**

0

4

8

12

16

// does not print 20 since 20 is not < 20 and while loop ends

1. What output is produced by the following code fragment?

for (int num = 0; num <= 200; num +=2)  
 System.out.println (num);

**SOLUTION**

0

2

4

6

...

200

1. Transform the following while loop into an equivalent do loop. (Make sure it produces the same output.)

int num = 1;  
while (num < 20)  
{  
 num++;  
 System.out.println (num);  
}

**SOLUTION**

Since the increment is done before the print, the loop produces the values 2 to 20.

int num = 1;  
do  
{  
 num++;  
 System.out.println (num);  
} while (num < 20);

1. Transform the while loop from Exercise 4.11 into an equivalent for loop. (Make sure it produces the same output.)

**SOLUTION**

for (int num = 2; num <= 20; num++)  
 System.out.println (num);

1. Write a do loop that verifies that the user enters an even integer value.

**SOLUTION**

Scanner scan = new Scanner (System.in);

int num;

do

{

System.out.print ("Enter an even integer: ");

num = scan.nextInt();

} while (num%2 == 1);

1. Write a for loop to print the multiples of 3 from 300 down to 3.

**SOLUTION**

for (int num = 300; num >= 3; num-=3)  
 System.out.println (num);

1. Write a code fragment that determines and prints the number of times the character ‘z’ appears in a String object called name.

**SOLUTION**

String name = "zuluzardoz"; // produces 3

int countz = 0;

for (int i = 0; i < name.length(); i++)

if (name.charAt(i) == 'z')

countz++;

System.out.println (name + " has " + countz);

1. Write a code fragment that prints the characters stored in a String object called str backward.

**SOLUTION**

String str = "lewis";

for (int i = str.length()-1; i >= 0; i--)

System.out.print(str.charAt(i));

System.out.println ();