COP-2210
Computer Programming I

Instructor: Dr. Antonio Hernandez

Text: Big Java: Early Objects, Interactive Edition, 6th Edition

Iteration Statements

21. *while* Loop

The *while* loop

The *while* loop:

```
while ( condition )
{
    <list of statements>;
}
```

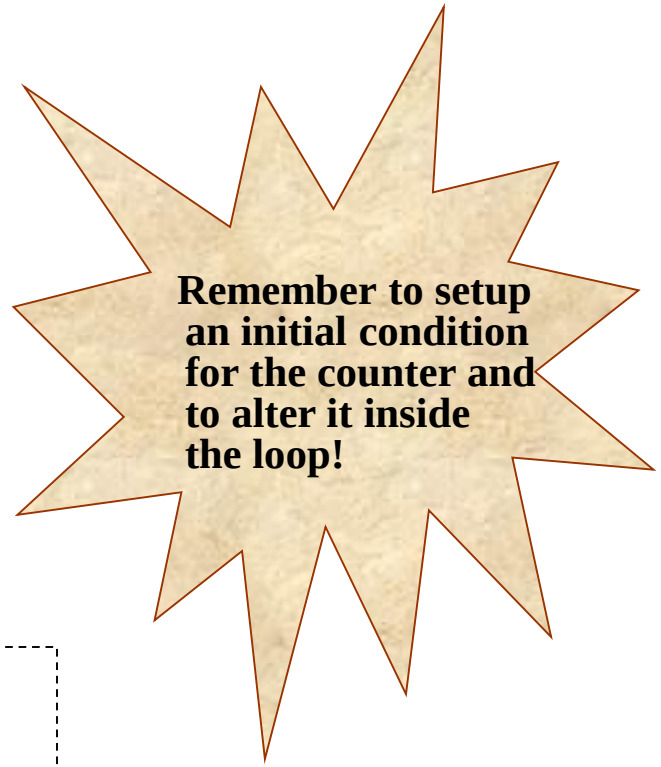
Example:

```
// write “hello world” 50 times
int count = 0;
while ( count < 50 )
{
    System.out.println ( “hello world” );
    ++count;
}
System.out.println ( “Good Bye!” );
```

while *loop*: *Try it yourself*

```
int t=1;

while ( t < 0)
{
    System.out.println(" It will not run");
    t++;
}
```




```
int  i = 10;

while ( i  > 0 )
{
    System.out.println("This is an infinite loop");
}
```

Basic *while* Loop: *Try it yourself*

```
// Prog21_01 : basic WHILE loop

public class Prog21_01
{
   public static void main(String args[])
   {
      int counter = 0;

      while ( counter < 10)
      {
         System.out.println("counter = " + counter);
         counter++;
      }

   }
}
```

while *loop*: *Try it yourself*

```
import java.util.Scanner;

public class Prog21_02
{
   public static void main(String[] args)
   {
      Scanner in = new Scanner (System.in);

      String answer = "y";
      while ( answer.equals("Y") || answer.equals("y") )
      {
         System.out.print("Want to see me again <Y/N>? ");
         answer = in.nextLine();
      }

      System.out.println("Bye!");
   }
}
```

To compare strings for equality, use “equals”

PRACTICE

Program 21_03:

Write a Java program that outputs a table of numbers from 1 to 10, with their squares and cubes.

(use a **while** loop)

while *loop*: *Try it yourself*

```
import java.util.Scanner;

public class Prog21_04 {
    public static void main(String args[]) {
        Scanner in = new Scanner(System.in);
        int ctr = 0;
        boolean stop = false;
        System.out.print("This program will stop after ten trials ");
        System.out.println("or when a negative number is entered");

        while (ctr < 10 && !stop)
        {
            System.out.print("Enter a number: ");
            double x = in.nextDouble();

            if (x < 0) stop = true;
            else System.out.println( "sqrt(" + x + ") = " + Math.sqrt(x) );

            ctr++;
        }
    }
}
```

PRACTICE

Program 21_05:

Write a Java program that reads strings from the user and concatenates them together. Program stops when user enters "Bye" ("Bye" will not be concatenated).

(use a **while** loop)

Iteration Statements

22. *do while* Loop

The *do while* loop

***do while* loop:**

```
do
{
    <list of statements>;
} while ( condition );
```

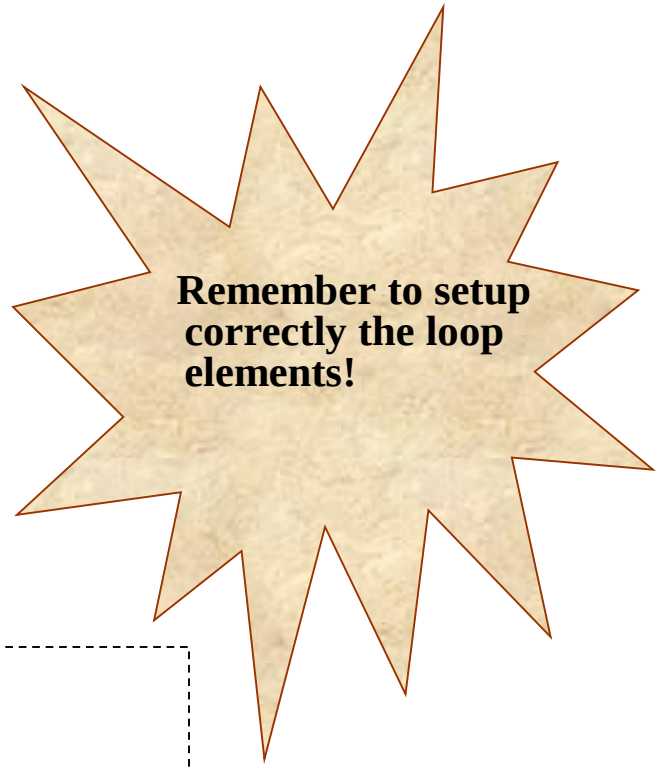
Example:

```
// write “hello world” 50 times
int count = 0;
do
{
    System.out println ( “hello world” );
    count++;
} while ( count < 50 );
System.out.println ( “Good Bye!” );
```

do while loop: *Try it yourself*

```
int t=10;

do
{
    System.out.println(" Runs exactly once ");
    t--;
} while ( t < 0);
```




```
int  i = 10;

do
{
     System.out.println("This is an infinite loop ");
} while ( i  > 0 );
```

while *loop*: *Try it yourself*

```
public class Prog22_01
{
   public static void main(String[] args)
   {
      Scanner in = new Scanner(System.in);

      String answer;

      do
      {
         System.out.print("Want to see me again <Y/N>? ");
         answer = in.nextLine();
      } while (answer.equals("Y") || answer.equals("y"));

      System.out.println("Bye!");
   }
}
```

No need to initialize *answer*

while *loop*: *Try it yourself*

```
import java.util.Scanner;

public class Prog22_02
{
   public static void main(String[] args)
   {
      int i = 0;

      do
      {
         i++;
         System.out.println("i = " + i);

         if (i % 2 == 0) i = 6;

      } while (i <= 5);
   }
}
```

What values of *i* will be printed?

PRACTICE

Program 22_03:

Write a Java program that outputs a table of numbers from 1 to 10, with their squares and cubes.

(use a **do/do-while** loop)

PRACTICE

Program 22_04:

Modify **program 17_05** to keep asking the user for an option until "3" is entered.

(use a **do/do-while** loop)

Iteration Statements

23. *continue / break* statements and loops

break statement

break; **statement**

Forces an immediate break, or exit, from the *switch* statement and loops (*for*, *while*, *do-while*).

break: *Try it yourself*

```
import java.util.Scanner;

public class Prog23_01 Prog21_04 {
    public static void main(String args[]) {
        Scanner in = new Scanner(System.in);
        int ctr = 0;
        boolean stop = false;
        System.out.print("This program will stop after ten trials ");
        System.out.println("or when a negative number is entered");

        while (ctr < 10 && !stop)
        {
            System.out.print("Enter a number: ");
            double x = in.nextDouble();

            if (x < 0) break; stop = true;
            else System.out.println( "sqrt(" + x + ") = " + Math.sqrt(x) );

            ctr++;
        }
    }
}
```

continue statement

continue; **statement**

Forces the next iteration of the loop (*for*, *while*, *do-while*) and will skip any code remaining in the loop.

break: *Try it yourself*

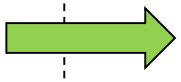
```
import java.util.Scanner;

public class Prog23_02
{
   public static void main(String args[])
   {
      Scanner in = new Scanner(System.in);

      for (int i = 1; i <= 10; i++)
      {
         System.out.print(i + ") Enter a number: ");
         double x = in.nextDouble();

         if (x < 0) continue;

         System.out.println("sqrt(" + x + ") = " + Math.sqrt(x));
      }
   }
}
```



PRACTICE

Program 23_03:

Modify **Prog21_05** so that if the user does not enter a string (user simply hits 'Enter'), no concatenation of a space will occur.

(use a *continue* statement)