

Chap03Youname.java

Input and output

```
import java.util.Scanner;  
//Import statement cannot be inside a class definition.
```

```
public class Chap03Yourname {  
    public static void main(String[] args) {  
        String line;  
        double inch;  
        int quotient;  
        Scanner in = new Scanner(System.in);  
        //By convention, all variables and constants are declared at the top of main.  
  
        //type here  
    }  
}
```

3.1 The **System** class

```
System.out.println("3.1 The System class");  
System.out.println(System.out);  
//The result indicates that System.out is a PrintStream.  
//ThinkJava says that out is a “special value” provided by the System class.  
//System is a class defined in the java.lang package.  
//"out" is a field in the System class (JavaLibrary).  
//PrintStream is a class defined in the java.io package.  
//https://docs.oracle.com/javase/7/docs/api/java/lang/System.html#out  
//https://docs.oracle.com/javase/7/docs/api/java/io/PrintStream.html  
System.out.println();
```

3.1 The **System** class

Class System

java.lang.Object
java.lang.System

```
public final class System
extends Object
```

The System class contains several useful class fields and methods. It cannot be instantiated.

Among the facilities provided by the System class are standard input, standard output, and error output streams; access to externally means of loading files and libraries; and a utility method for quickly copying a portion of an array.

Since:

JDK1.0

Field Summary

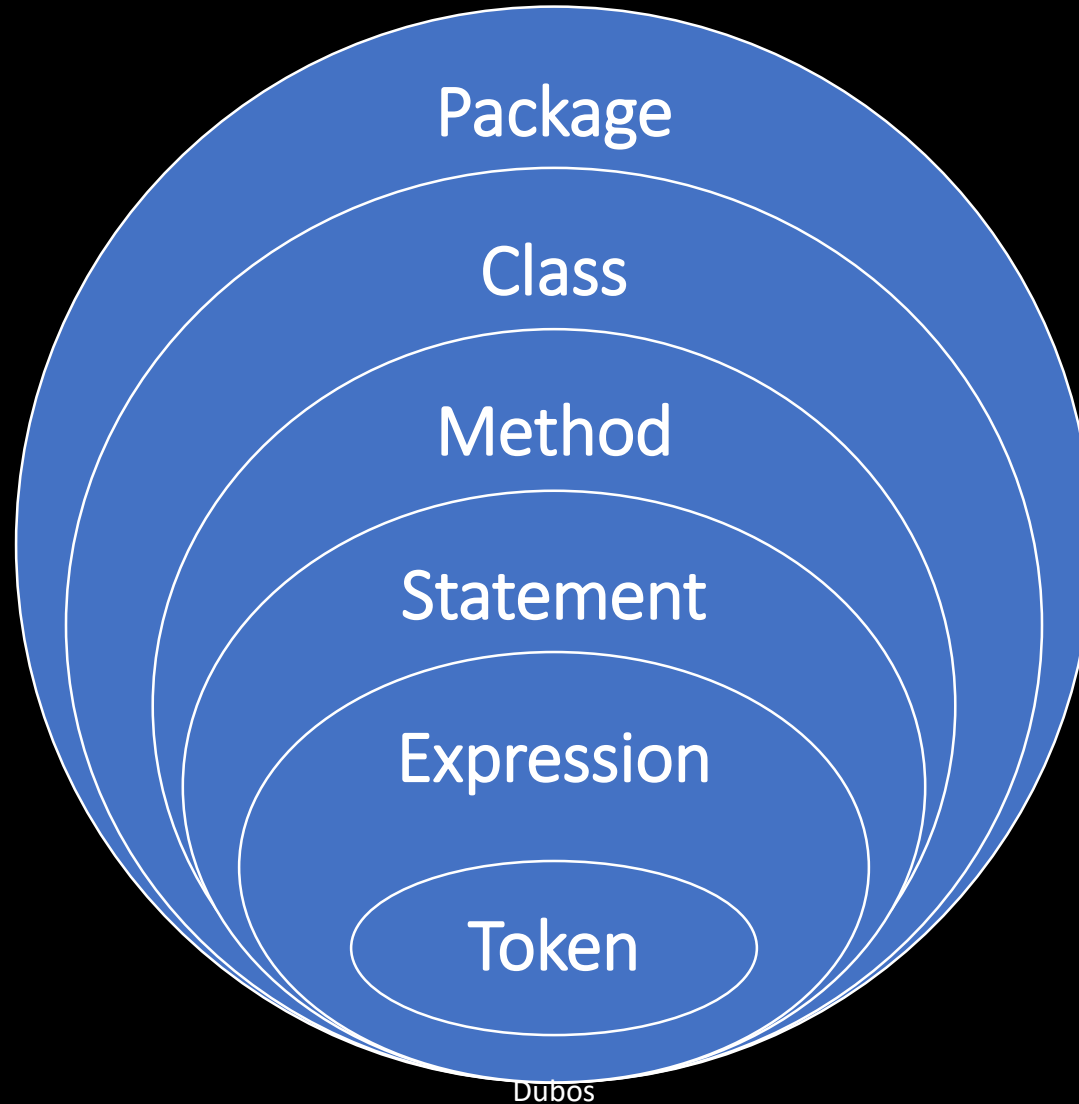
Fields

Modifier and Type	Field and Description
static PrintStream	err The "standard" error output stream.
static InputStream	in The "standard" input stream.
static PrintStream	out The "standard" output stream.

Dubos

<https://docs.oracle.com/javase/8/docs/api/java/lang/System.html>

3.1 The **System** class



```
import java.util.Scanner;  
//Import statement cannot be inside a class definition.
```

```
public class Chap03Yourname {  
  
    public static void main(String[] args) {  
        String line;  
        double inch;  
        int quotient;  
        Scanner in = new Scanner(System.in);  
        //By convention, all variables and constants are declared at the top of main.  
  
    }  
}
```

```
import java.util.Scanner;  
//Import statement cannot be inside a class definition.
```

```
public class Chap03Yourname {  
    private static Scanner in;  
    public static void main(String[] args) {  
        String line;  
        double inch;  
        int quotient;  
        in = new Scanner(System.in);  
        //By convention, all variables and constants are declared at the top of main.  
  
    }  
}
```

3.2 The **Scanner** class, and the **nextLine** method

```
System.out.println("3.2 The Scanner class, and the nextLine method");
```

```
System.out.print("Type something: ");
```

```
line = in.nextLine();
```

```
//The nextLine method read a line of input from the keyboard and returns
```

```
//a String. It reads characters until it gets to a new line.
```

```
System.out.println("You said: " + line);
```

```
System.out.print("Type something else: ");
```

```
line = in.nextLine();
```

```
System.out.println("You also said: " + line);
```

```
System.out.println();
```


3.4-3.5 **nextInt**, **nextDouble**, and **constants**

```
System.out.println("3.4-3.5 nextInt, nextDouble, and constants");
System.out.print("What is your height in centimeters?");
cm = in.nextDouble();
//nextInt reads input from the keyboard and returns a floor integer.
//nextDouble reads input and returns a floating-point number.
//nextInt and nextDouble read characters until it gets to a non-digit.
inch = cm / CM_PER_INCH;
System.out.print(cm + " centimeters = ");
System.out.println(inch + " inches");
System.out.println();
```

```
import java.util.Scanner;  
//Import statement cannot be inside a class definition.
```

```
public class Chap03Yourname {  
    private static Scanner in;  
    public static void main(String[] args) {  
        String line;  
        double inch;  
        int quotient;  
        in = new Scanner(System.in);  
        //By convention, all variables and constants are declared at the top of main.  
  
    }  
}
```

```
import java.util.Scanner;  
//Import statement cannot be inside a class definition.
```

```
public class Chap03Yourname {  
    private static Scanner in;  
    public static void main(String[] args) {  
        String line;  
        double inch, cm;  
        final double CM_PER_INCH = 2.54;  
        int quotient;  
        in = new Scanner(System.in);  
        //By convention, all variables and constants are declared at the top of main.  
  
    }  
}
```

3.10 Scanner bug, and the %s %d format specifiers

What is your name? Dub

What is your age? 55

Hello Dub, age 55.

```
System.out.println("3.10 The Scanner bug, and the %s format specifier");
```

```
System.out.print("What is your name? ");
```

```
???
```

```
System.out.println();
```

3.10 Scanner bug, and the **%s %d** format specifiers

```
System.out.println("3.10 The Scanner bug, and the %s format specifier");  
System.out.print("What is your name? ");  
name = in.nextLine();  
System.out.print("What is your age? ");  
age = in.nextInt();  
System.out.printf("Hello " + name + ", age " + age + ".");  
System.out.println();
```

3.10 Scanner bug, and the %s %d format specifiers

```
System.out.println("3.10 The Scanner bug, and the %s format specifier");
```

```
System.out.print("What is your name? ");
```

```
in.nextLine();
```

```
//read the new line /n, because a /n was typed before.
```

```
name = in.nextLine();
```

```
System.out.print("What is your age? ");
```

```
age = in.nextInt();
```

```
System.out.printf("Hello " + name + ", age " + age + ".");
```

```
System.out.println();
```

3.10 Scanner bug, and the %s %d format specifiers

```
System.out.println("3.10 The Scanner bug, and the %s format specifier");
```

```
System.out.print("What is your name? ");
```

```
in.nextLine();
```

```
name = in.nextLine();
```

```
System.out.print("What is your age? ");
```

```
age = in.nextInt();
```

```
System.out.printf("Hello %s, age %d.\n", name, age);
```

//The format specifier %s indicates that the following value should be

//displayed as String. %d indicates int.

```
System.out.println();
```

3.10 Scanner bug, and the `%s %d` format specifiers

What is your age? 55

What is your name? Dub

Hello Dub, age 55.

```
System.out.print("What is your age? ");
```

```
???
```

```
System.out.println();
```


3.10 Scanner bug, and the **%s %d** format specifiers

```
System.out.print("What is your age? ");  
age = in.nextInt();  
in.nextLine();  
System.out.print("What is your name? ");  
name = in.nextLine();  
System.out.printf("Hello %s, age %d.\n", name, age);  
System.out.println();
```

3.6 The **printf** method, the **%f** format specifier

```
System.out.println("3.6 The printf method, the %f and %d format  
specifiers");
```

```
System.out.print("An example of the \"%f\" format specifier: ");
```

```
System.out.printf("%.1f centimeters = %.4f inches\n", cm, inch);
```

3.6 The **printf** method, the **%f** format specifier

```
System.out.println("Four examples of the \"%d\" format specifier: ");
```

```
System.out.printf("%08d\n", 1234);
```

//%08d display the integer padded with zeros, at least 8 digits wide.

```
System.out.printf("%d\n", 5,6,7);
```

```
System.out.printf("%d %d\n", 5,6,7);
```

```
System.out.printf("%d %d %d\n", 5,6,7);
```

```
System.out.println();
```

3.6 The **printf** method, the **%f** format specifier

```
System.out.println("Four examples of the \"%d\" format specifier: ");
```

```
System.out.printf("%08d\n", 1234);
```

//%08d display the integer padded with zeros, at least 8 digits wide.

```
System.out.printf("%d\n", 5,6,7);
```

```
System.out.printf("%d %d\n", 5,6,7);
```

```
System.out.printf("%d %d %d\n", 5,6,7);
```

```
System.out.println();
```

3.7 Type cast

```
System.out.print("3.7 Type cast");  
inchInt = (int) inch;  
inchDouble = (double) inchInt;  
System.out.println("You are about " + inchInt + " inches. (inchInt)");  
System.out.println("You are about " + inchDouble + " inches. (inchDouble)");  
System.out.printf("You are about %.0f inches.", inch);  
System.out.println(" (%.0f)");  
//The (int) operator rounds toward 0.  
//The %.0f format specifier displays the closest integer.  
System.out.println();
```

3.8 Modulus operator

```
System.out.println("3.8 Modulus operator");
```

```
quotient = inchInt / 12;
```

```
remainderInt = inchInt % 12;
```

```
remainderDouble = inch % 12;
```

The quotient of (70 / 12) is 5,

the remainderInt of (70 / 12) is 10,

and the remainderDouble of (70.866142 / 12) is 10.866142.

180.000000 cm is about 5 feet 11 inches.

- ```
System.out.println();
```

## 3.8 Modulus operator

```
System.out.println("3.8 Modulus operator");
```

```
quotient = inchInt / 12;
```

```
remainderInt = inchInt % 12;
```

```
remainderDouble = inch % 12;
```

```
System.out.printf("The quotient of (%d / 12) is %d", inchInt, quotient);
```

```
System.out.println();
```

## 3.8 Modulus operator

```
System.out.println("3.8 Modulus operator");
```

```
quotient = inchInt / 12;
```

```
remainderInt = inchInt % 12;
```

```
remainderDouble = inch % 12;
```

```
System.out.printf("The quotient of (%d / 12) is %d", inchInt, quotient);
```

```
System.out.printf(",\nthe remainderInt of (%d / 12) is %d,\n", inchInt, remainderInt);
```

```
System.out.println();
```



## 3.8 Modulus operator

```
System.out.println("3.8 Modulus operator");
```

```
quotient = inchInt / 12;
```

```
remainderInt = inchInt % 12;
```

```
remainderDouble = inch % 12;
```

```
System.out.printf("The quotient of (%d / 12) is %d", inchInt, quotient);
```

```
System.out.printf(",\nthe remainderInt of (%d / 12) is %d,\n", inchInt, remainderInt);
```

```
System.out.printf("and the remainderDouble of (%f /12) is %f.\n", inch, remainderDouble);
```

```
System.out.println();
```

## 3.8 Modulus operator

```
System.out.println("3.8 Modulus operator");
quotient = inchInt / 12;
remainderInt = inchInt % 12;
remainderDouble = inch % 12;
System.out.printf("The quotient of (%d / 12) is %d", inchInt, quotient);
System.out.printf(",\nthe remainderInt of (%d / 12) is %d,\n", inchInt, remainderInt);
System.out.printf("and the remainderDouble of (%f /12) is %f.\n", inch, remainderDouble);
System.out.printf("%f cm is about %d feet %.0f inches.\n", cm, quotient, remainderDouble);
System.out.println();
```

## 3.8 Modulus operator

```
System.out.println(- 76 / 12);
```

```
System.out.println(- 76 % 12);
```

```
System.out.println(76 / - 12);
```

```
System.out.println(76 % - 12);
```

//When either dividend or divisor is negative, the naive definition breaks  
//down and programming languages differ in how these values are defined.

//In Java, results of integer modulo operator % and floating-point modulo  
//operator % have the **same sign as dividend**.

```
System.out.println();
```