

**This section of notes is taken from *Java Data Types* at <http://www.roseindia.net/java/language/java-data-types.shtml>**

Java programming language is a language in which all the variables must be declared first and then to be used. That means to specify the name and the type of the variable. This specifies that Java is a strongly-typed programming language. Like

```
int pedal = 1;
```

This shows that there exists a field named 'pedal' that holds a data as a numerical value '1'. The values contained by the variables determines its data type and to perform the operations on it. **There are seven more primitive data types which are supported by Java language programming in addition to int.** A primitive data type is a data type which is predefined in Java. Following are the eight primitive data types:

### **int**

It is a 32-bit signed two's complement integer data type. It ranges from -2,147,483,648 to 2,147,483,647. This data type is used for integer values. However for wider range of values use **long**.

### **byte**

The byte data type is an 8-bit signed two's complement integer. It ranges from -128 to 127 (inclusive). We can save memory in large arrays using byte. We can also use byte instead of int to increase the limit of the code.

### **short**

The short data type is a 16-bit signed two's complement integer. It ranges from -32,768 to 32,767. **short** is used to save memory in large arrays.

### **long**

The long data type is a 64-bit signed two's complement integer. It ranges from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807. Use this data type with larger range of values.

### **float**

The float data type is a single-precision 32-bit IEEE 754 floating point. It ranges from 1.40129846432481707e-45 to 3.40282346638528860e+38 (positive or negative). Use a float (instead of double) to save memory in large arrays. We do not use this data type for the exact values such as currency. For that we have to use `java.math.BigDecimal` class.

### **double**

This data type is a double-precision 64-bit IEEE 754 floating point. It ranges from 4.94065645841246544e-324d to 1.79769313486231570e+308d (positive or negative). This data type is generally the default choice for decimal values.

### **boolean**

The boolean data type is 1-bit and has only two values: **true** and **false**. We use this data type for conditional statements. true and false are not the same as True and False. They are defined constants of the language.

### **char**

The char data type is a single 16-bit, unsigned Unicode character. It ranges from 0 to 65,535. They are not same as ints, shorts etc.

The following table shows the default values for the data types:

<b>Keyword</b>	<b>Description</b>	<b>Size/Format</b>
byte	Byte-length integer	8-bit two's complement
short	Short integer	16-bit two's complement
int	Integer	32-bit two's complement
long	Long integer	64-bit two's complement
float	Single-precision floating point	32-bit IEEE
double	Double-precision floating point	64-bit IEEE
char	A single character	16-bit Unicode character
boolean	A boolean value (true or false)	true or false

When we declare a field it is not always essential that we initialize it too. The compiler sets a default value to the fields which are not initialized which might be zero or null. However this is not recommended.