1. **Implicit casting**
2. **Explicit casting**
3. **Boolean casting.**

**1. Implicit casting (widening conversion)**

**A data type of lower size (occupying less memory) is assigned to a data type of higher size**. This is done implicitly by the JVM. The lower size is widened to higher size. This is also named as **automatic type conversion**.

Examples:

|  |
| --- |
| **int** x = 10; *// occupies 4 bytes*  **double** y = x; *// occupies 8 bytes*  System.out.println(y); *// prints 10.0* |

In the above code 4 bytes integer value is assigned to 8 bytes double value.

**2. Explicit casting (narrowing conversion)**

A data type of higher size (occupying more memory) cannot be assigned to a data type of lower size. This is not done implicitly by the JVM and requires **explicit casting**; a casting operation to be performed by the programmer. The higher size is narrowed to lower size.

|  |
| --- |
| **double** x = 10.5; *// 8 bytes*  **int** y = x; *// 4 bytes ; raises compilation error* |

In the above code, 8 bytes double value is narrowed to 4 bytes int value. It raises error. Let us explicitly type cast it.

|  |
| --- |
| **double** x = 10.5;  **int** y = (**int**) x; |

The double**x** is explicitly converted to int **y**. The thumb rule is, on both sides, the same data type should exist.  
 **3. Boolean casting**

A boolean value cannot be assigned to any other data type. Except boolean, all the remaining 7 data types can be assigned to one another either implicitly or explicitly; but boolean cannot. We say, boolean is **incompatible** for conversion. Maximum we can assign a boolean value to another boolean.

Following raises error.

|  |
| --- |
| **boolean** x = **true**;  **int** y = x; *// error* |
| **boolean** x = **true**;  **int** y = (**int**) x; *// error* |

byte –> short –> int –> long –> float –> double

In the above statement, left to right can be assigned implicitly and right to left requires explicit casting. That is,**byte** can be assigned to **short**implicitly but **short**to **byte** requires explicit casting.

Following char operations are possible.

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15 | **public** **class** Demo  {  **public** **static** **void** main(String args[])  {  **char** ch1 = 'A';  **double** d1 = ch1;    System.out.println(d1); *// prints 65.0*  System.out.println(ch1 \* ch1); *// prints 4225 , 65 \* 65*    **double** d2 = 66.0;  **char** ch2 = (**char**) d2;  System.out.println(ch2); *// prints B*  }  } |

[Object casting (reference casting)](http://way2java.com/casting-operations/object-casting/) discusses casting between objects of different classes involved in inheritance.

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**Your one stop destination for all data type conversions**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **byte TO** | [short](http://way2java.com/casting-operations/java-byte-to-short/) | [int](http://way2java.com/casting-operations/java-byte-to-int/) | [long](http://way2java.com/casting-operations/java-byte-to-long/) | [float](http://way2java.com/casting-operations/java-byte-to-float/) | [double](http://way2java.com/casting-operations/java-byte-to-double/) | [char](http://way2java.com/casting-operations/java-byte-to-char/) | [boolean](http://way2java.com/casting-operations/java-byte-to-boolean/) |
| **short TO** | [byte](http://way2java.com/casting-operations/java-short-to-byte/) | [int](http://way2java.com/casting-operations/java-short-to-int/) | [long](http://way2java.com/casting-operations/java-short-to-long/) | [float](http://way2java.com/casting-operations/java-short-to-float/) | [double](http://way2java.com/casting-operations/java-short-to-double/) | [char](http://way2java.com/casting-operations/java-short-to-char/) | [boolean](http://way2java.com/casting-operations/java-short-to-boolean/) |
| **int TO** | [byte](http://way2java.com/casting-operations/java-int-to-byte/) | [short](http://way2java.com/casting-operations/java-int-to-short/) | [long](http://way2java.com/casting-operations/java-int-to-long/) | [float](http://way2java.com/casting-operations/java-int-to-float/) | [double](http://way2java.com/casting-operations/java-int-to-double/) | [char](http://way2java.com/casting-operations/java-int-to-char/) | [boolean](http://way2java.com/casting-operations/java-int-to-boolean/) |
| **float TO** | [byte](http://way2java.com/casting-operations/java-float-to-byte/) | [short](http://way2java.com/casting-operations/java-float-to-short/) | [int](http://way2java.com/casting-operations/java-float-to-int/) | [long](http://way2java.com/casting-operations/java-float-to-long/) | [double](http://way2java.com/casting-operations/java-float-to-double/) | [char](http://way2java.com/casting-operations/java-float-to-char/) | [boolean](http://way2java.com/casting-operations/java-float-to-boolean/) |
| **double TO** | [byte](http://way2java.com/casting-operations/java-double-to-byte/) | [short](http://way2java.com/casting-operations/java-double-to-short/) | [int](http://way2java.com/casting-operations/java-double-to-int/) | [long](http://way2java.com/casting-operations/java-double-to-long/) | [float](http://way2java.com/casting-operations/java-double-to-float/) | [char](http://way2java.com/casting-operations/java-double-to-char/) | [boolean](http://way2java.com/casting-operations/java-double-to-boolean/) |
| **char TO** | [byte](http://way2java.com/casting-operations/java-float-to-byte/) | [short](http://way2java.com/casting-operations/char-to-short/) | [int](http://way2java.com/casting-operations/char-to-int/) | [long](http://way2java.com/casting-operations/java-char-to-long/) | [float](http://way2java.com/casting-operations/java-char-to-float/) | [double](http://way2java.com/casting-operations/java-char-to-double/) | [boolean](http://way2java.com/casting-operations/java-char-to-boolean/) |
| **boolean TO** | [byte](http://way2java.com/casting-operations/java-boolean-to-byte/) | [short](http://way2java.com/casting-operations/java-boolean-to-short/) | [int](http://way2java.com/casting-operations/java-boolean-to-int/) | [long](http://way2java.com/casting-operations/java-boolean-to-long/) | [float](http://way2java.com/casting-operations/java-boolean-to-float/) | [double](http://way2java.com/casting-operations/java-boolean-to-double/) | [char](http://way2java.com/casting-operations/java-boolean-to-char/) |

**String and data type conversions**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **String TO** | [byte](http://way2java.com/java-lang/string-to-byte-conversion-in-java/) | [short](http://way2java.com/java-lang/string-to-short-conversion-in-java/) | [int](http://way2java.com/java-lang/string-to-int-conversion-in-java/) | [long](http://way2java.com/java-lang/string-to-long-conversion-in-java/) | [float](http://way2java.com/java-lang/string-to-float-conversion-in-java/) | [double](http://way2java.com/java-lang/string-to-double-conversion-in-java/) | [char](http://way2java.com/java-lang/string-to-char-conversion-in-java/) | [boolean](http://way2java.com/java-lang/string-to-boolean-conversion-in-java/) |