ype casting in Java involves converting a variable from one type to another. There are two main types of casting: **implicit (automatic) casting** and **explicit (manual) casting**.

Byte->short->char->int-long->float->double

**1. Implicit (Widening) Casting**

This type of casting is automatically done by the Java compiler when you assign a smaller data type to a larger data type. No special syntax is required.

public class Main {

public static void main(String[] args) {

int myInt = 9;

double myDouble = myInt; // Automatic casting: int to double

System.out.println(myInt); // Output: 9

System.out.println(myDouble); // Output: 9.0

}

}

### 2. Explicit (Narrowing) Casting

This type of casting must be done manually by placing the type in parentheses in front of the value. It’s necessary when you are converting a larger data type to a smaller data type.

**Example:**

public class Main {

public static void main(String[] args) {

double myDouble = 9.78;

int myInt = (int) myDouble; // Manual casting: double to int

System.out.println(myDouble); // Output: 9.78

System.out.println(myInt); // Output: 9

}

}

### Casting Between Reference Types

In Java, casting between reference types is done with inheritance. You can cast an object of a subclass to a superclass (upcasting), and you can cast an object of a superclass to a subclass (downcasting).

class Animal {

public void makeSound() {

System.out.println("Animal makes a sound");

}

}

class Dog extends Animal {

public void makeSound() {

System.out.println("Dog barks");

}

}

public class Main {

public static void main(String[] args) {

Animal myAnimal = new Dog(); // Upcasting

myAnimal.makeSound(); // Output: Dog barks

}

}

Example of Downcasting:

class Animal {

public void makeSound() {

System.out.println("Animal makes a sound");

}

}

class Dog extends Animal {

public void makeSound() {

System.out.println("Dog barks");

}

public void bark() {

System.out.println("Bark!");

}

}

public class Main {

public static void main(String[] args) {

Animal myAnimal = new Dog(); // Upcasting

Dog myDog = (Dog) myAnimal; // Downcasting

myDog.bark(); // Output: Bark!

}

}

### Type Casting with Primitive Data Types

**Example of casting a long to an int:**

public class Main {

public static void main(String[] args) {

long myLong = 100000L;

int myInt = (int) myLong; // Manual casting: long to int

System.out.println(myLong); // Output: 100000

System.out.println(myInt); // Output: 100000

}

}

Example of casting a float to a byte:

public class Main {

public static void main(String[] args) {

float myFloat = 5.5f;

byte myByte = (byte) myFloat; // Manual casting: float to byte

System.out.println(myFloat); // Output: 5.5

System.out.println(myByte); // Output: 5

}

}