Type Casting In Java

Types of type casting:

- Implicit Casting (Widening Casting)
- Explicit Casting (Narrowing Casting)

Implicit Casting (Widening Casting)

```
public class HelloWorld {
    public static void main(String[] args) {
        byte b = 5;
        short s = b;
        int i = b;
        long l = b;
        float f = b;
        double d = b;
        System.out.println(s);
        System.out.println(i);
        System.out.println(l);
        System.out.println(f);
        System.out.println(d);
    }
}
```

Explicit Casting (Narrowing Casting)

```
public class HelloWorld {
    public static void main(String[] args) {
        long b = 5;
        short s = b;
        int i = b;
        System.out.println("Short value: " + s);
        System.out.println("Int value: " + i);
    }
}
```

```
$Error~
Java compile error:
/var/www/html/sql/src/20240613071743948641/He
lloWorld.java:4: error: incompatible types: possible
lossy conversion from long to short
        short s = b;
                  ^
/var/www/html/sql/src/20240613071743948641/He
lloWorld.java:5: error: incompatible types: possible
lossy conversion from long to int
        int i = b;
                ^
2 errors
```

Byte

Widening Conversions (implicit):

```
byte b = 10;
short s = b;
int i = b;
long l = b;
float f = b;
double d = b;

System.out.println(s);  // Output: 10
System.out.println(i);  // Output: 10
System.out.println(l);  // Output: 10
System.out.println(f);  // Output: 10.0
System.out.println(d);  // Output: 10.0
```

Narrowing Conversions (explicit):

```
byte b = 100;
char c = (char) b;

System.out.println(c);

// Output: d
```

short

Widening Conversions (implicit):

```
short s = 10;
int i = s;
long l = s;
float f = s;
double d = s;

System.out.println(i);  // Output: 10
System.out.println(l);  // Output: 10
System.out.println(f);  // Output: 10.0
System.out.println(d);  // Output: 10.0
```

Narrowing Conversions (explicit):

```
short s = 10;
byte b = (byte) s;
char c = (char) s;

System.out.println(b);  // Output: 10
System.out.println(c);  // Output: (non-printable character because short value 10 does not map to a printable char)
```

int

Widening Conversions (implicit):

```
int i = 10;
long l = i;
float f = i;
double d = i;

System.out.println(l);  // Output: 10
System.out.println(f);  // Output: 10.0
System.out.println(d);  // Output: 10.0
```

Narrowing Conversions (explicit):

```
int i = 65;
byte b = (byte) i;
short s = (short) i;
char c = (char) i;

System.out.println(b);  // Output: 65
System.out.println(s);  // Output: 65
System.out.println(c);  // Output: A
```

long

Widening Conversions (implicit):

```
long l = 10L;
float f = l;
double d = l;

System.out.println(f);  // Output: 10.0
System.out.println(d);  // Output: 10.0
```

Narrowing Conversions (explicit):

```
long l = 65L;
byte b = (byte) l;
short s = (short) l;
int i = (int) l;
char c = (char) l;

System.out.println(b);  // Output: 65
System.out.println(s);  // Output: 65
System.out.println(i);  // Output: 65
System.out.println(c);  // Output: A
```

float

Widening Conversions (implicit):

```
float f = 10.5f;
double d = f;

System.out.println(d);  // Output: 10.5
```

Narrowing Conversions (explicit):

```
float f = 10.5f;
byte b = (byte) f;
short s = (short) f;
int i = (int) f;
long l = (long) f;
char c = (char) f;

System.out.println(b);  // Output: 10
System.out.println(s);  // Output: 10
System.out.println(i);  // Output: 10
System.out.println(l);  // Output: 10
System.out.println(c);  // Output: (non-printable character)
```

double

Narrowing Conversions (explicit):

```
double d = 10.5;
byte b = (byte) d;
short s = (short) d;
int i = (int) d;
long l = (long) d;
float f = (float) d;
char c = (char) d;

System.out.println(b);  // Output: 10
System.out.println(s);  // Output: 10
System.out.println(i);  // Output: 10
System.out.println(l);  // Output: 10
System.out.println(f);  // Output: 10.5
System.out.println(c);  // Output: (non-printable character)
```

char

Widening Conversions (implicit):

```
char c = 'A';
int i = c;
long l = c;
float f = c;
double d = c;

System.out.println(i);  // Output: 65
System.out.println(l);  // Output: 65
System.out.println(f);  // Output: 65.0
System.out.println(d);  // Output: 65.0
```

Narrowing Conversions (explicit):

```
char c = 'A';
byte b = (byte) c;
short s = (short) c;

System.out.println(b);  // Output: 65
System.out.println(s);  // Output: 65
```

boolean

Cannot be cast to or from any other primitive type.

Widening Conversions (implicit):
Automatically done when converting a smaller type to a larger type.

Narrowing Conversions (explicit):
Require an explicit cast when converting a larger type to a smaller type.