

Tutorial 2

CSC 201

Java Programming Concepts

مبادئ البرمجة باستخدام الجافا

Chapter 2

4. Automatic Data Conversion

٤- التحويل التلقائي لنوع البيانات

Java performs automatic data type conversion between values of primitive types when assigning a “small” data-type variable to a “larger” data-type variable. For example, when assigning an int to long. This is called widening primitive conversions.

The permitted widening primitive conversions are:

From byte to short, int, long, float, or double

From short to int, long, float, or double

From char to int, long, float, or double

From int to long, float, or double

From long to float or double

From float to double.

Shortly, allowed automatic data conversions:

byte --> short --> int --> long --> float --> double

In general, a value to the left can be assigned to a variable to the right without explicit casting. In particular, note that you can assign a value of any integer type to a variable of any floating-point type.

Type Casting

Type casting involves changing the type of a value from its normal type to some other type. That means that type conversion can be carried out automatically if the value of a data type to be converted appears before the other one on the above list , otherwise it must be "forced" manually (explicitly).

هو تغيير نوع البيانات لقيمة ما. وهذا التغيير قد يحدث تلقائيا إذا كان نوع البيانات يسبق النوع الآخر في القائمة المشار إليها في الشريحة السابقة، وإلا لابد من تنفيذ ذلك بأمر

Examples

1) If you try

```
int anotherVar = 345.892;
```

The compiler would protest loudly because a double cannot be stored in an int variable without loss of precision. Wrong direction! You must make an explicit cast.

```
int anotherVar = (int)345.892;
```

2)

```
// Casting float into int
```

```
float x=5.1f;
```

```
int i=1;
```

```
int j= (int)(i*x);
```

```
System.out.println("Mixed int and float:j=" +j);
```

//Note:this is done without Casting (Automatic Conversion)

```
float y=2.0f;
```

```
double dy=2.0;
```

```
double dz=dy * y;
```

```
System.out.println("Mixed float and double: dz=dy*y =" +dz);
```

3)

//Automatic Conversion: from char into int

```
char c='a';
```

```
int i;
```

```
i=c;
```

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

// this will display the Unicode of letter 'a' : 97

4)

// Casting int into byte

```
byte a = 1;
```

```
byte b = 2;
```

```
byte c = a + b; // Compile-Error: a and b are promoted to int
```

```
byte c = (byte)(a + b); // compiles ok
```

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

5)

```
double cents;
```

```
cents = 26.99;
```

```
int Bill;
```

```
Bill=(int )cents; // Bill now equals 26
```