

KODNEST ASSIGNMENT 4

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TYPE CASTING

The process of converting data of one type to another. Two types-

1. **Implicit type casting**
2. **Explicit type casting**

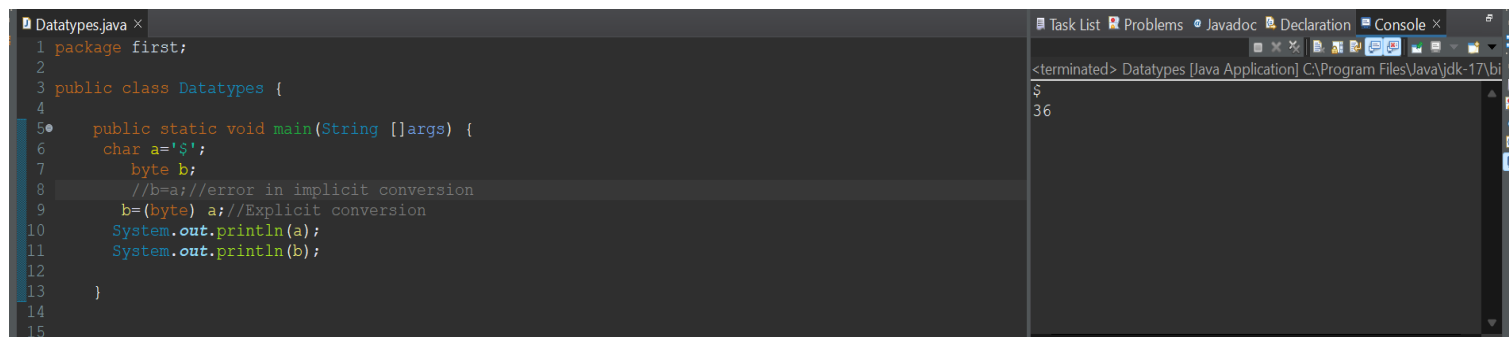
Implicit type casting: The process of converting the data of smaller data type to larger data type. (No data loss would occur)

Explicit type casting: The process of converting the data of larger data type to smaller data type. (You may lose data)

We have the following data types.

1. Char
2. Byte
3. Short
4. Int
5. Long
6. Float
7. Double
8. Boolean

Char to byte



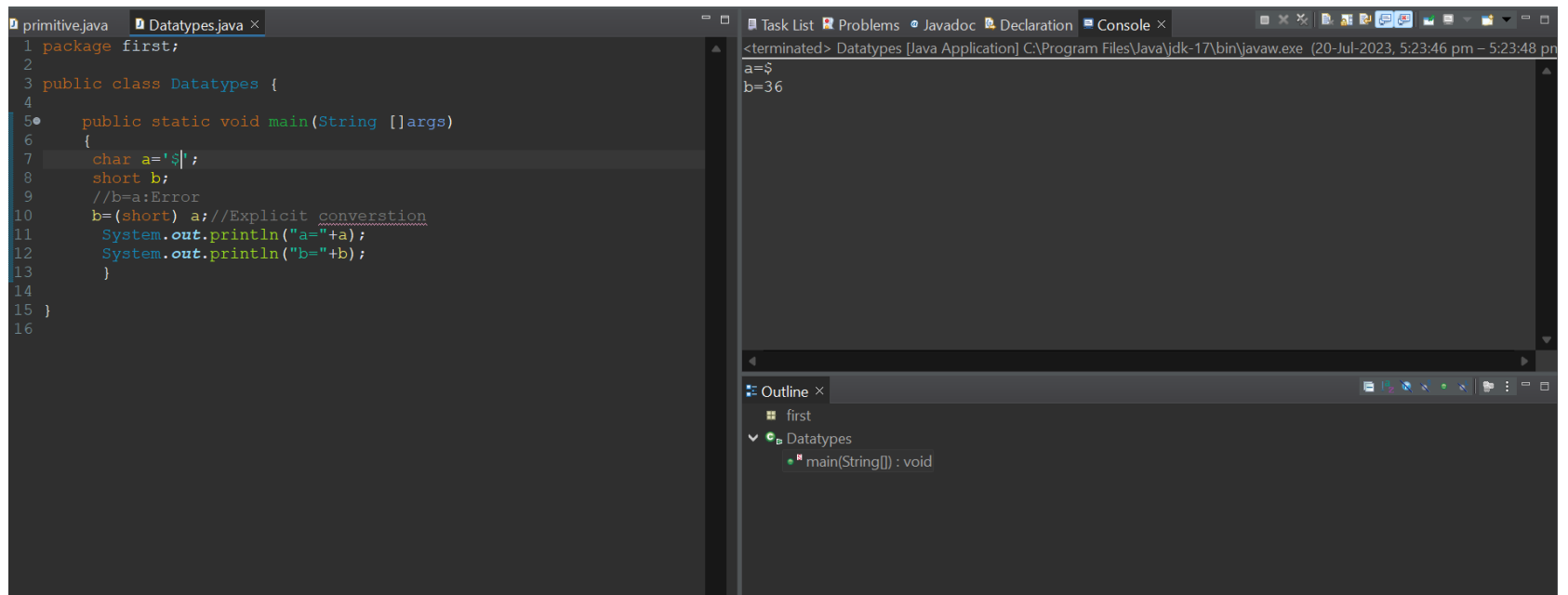
```
Datatypes.java x
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         char a='$';
7         byte b;
8         //b=a;//error in implicit conversion
9         b=(byte) a;//Explicit conversion
10        System.out.println(a);
11        System.out.println(b);
12    }
13 }
14
15
```

Task List Problems Javadoc Declaration Console x

```
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
$
36
```

Note : Implicit cannot be done ,for char to byte explicit casting should be done.

Char to short



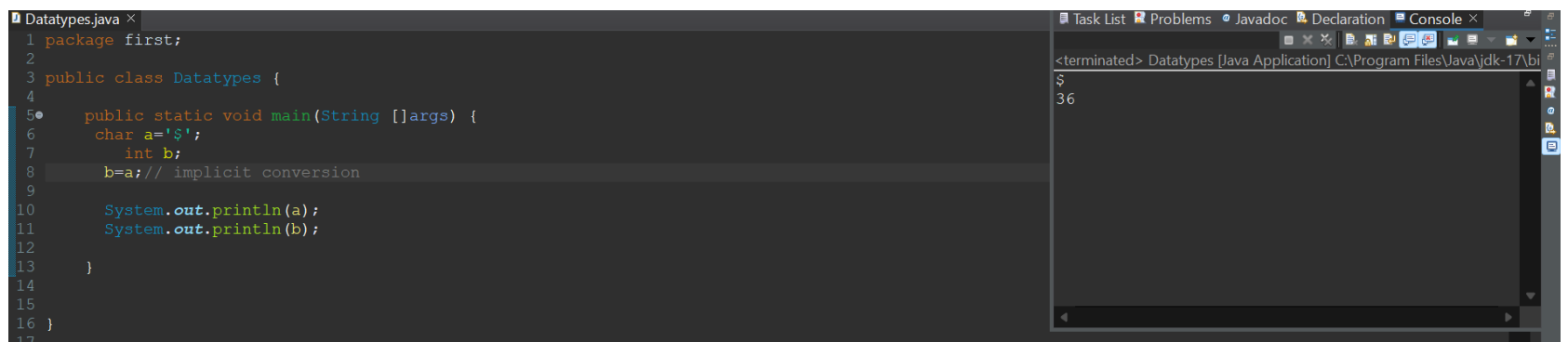
```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         char a='$';
8         short b;
9         //b=a:Error
10        b=(short) a; //Explicit conversion
11        System.out.println("a="+a);
12        System.out.println("b="+b);
13    }
14 }
15
16
```

<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (20-Jul-2023, 5:23:46 pm - 5:23:48 pm)
a=\$
b=36

Outline ×
first
Datatypes
main(String[]) : void

Note : Implicit casting cannot be done ,for char to short explicit casting should be done.

Char to int

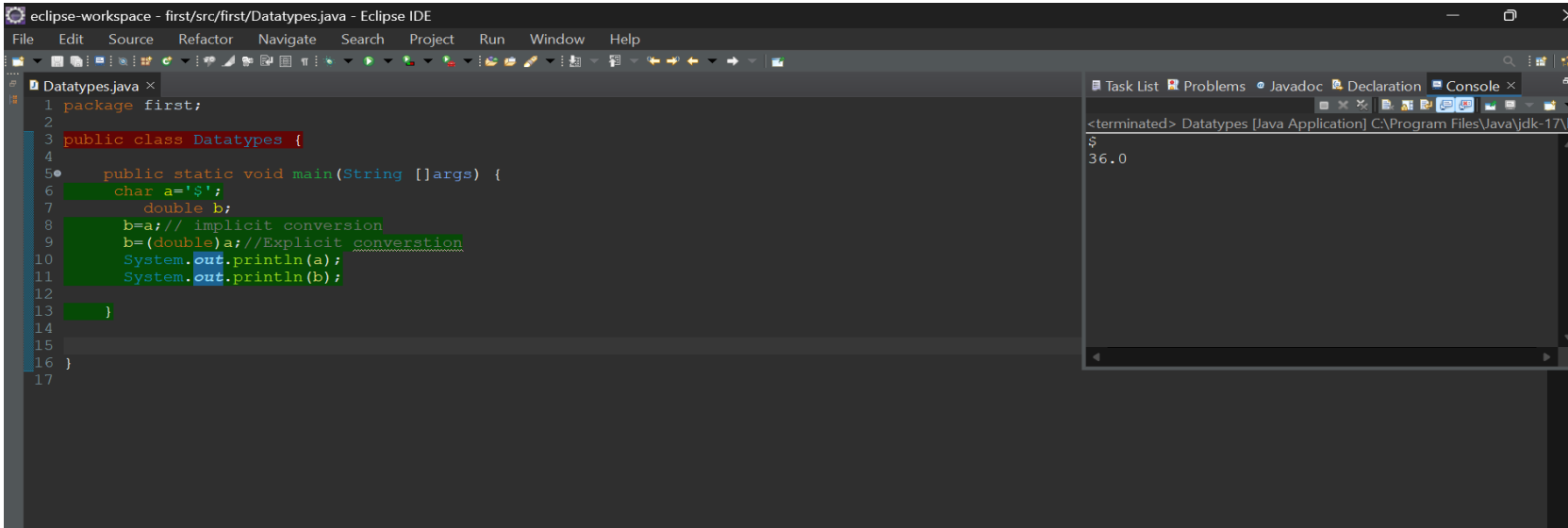


```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         char a='$';
7         int b;
8         b=a; // implicit conversion
9     }
10
11     System.out.println(a);
12     System.out.println(b);
13 }
14
15
16 }
17
```

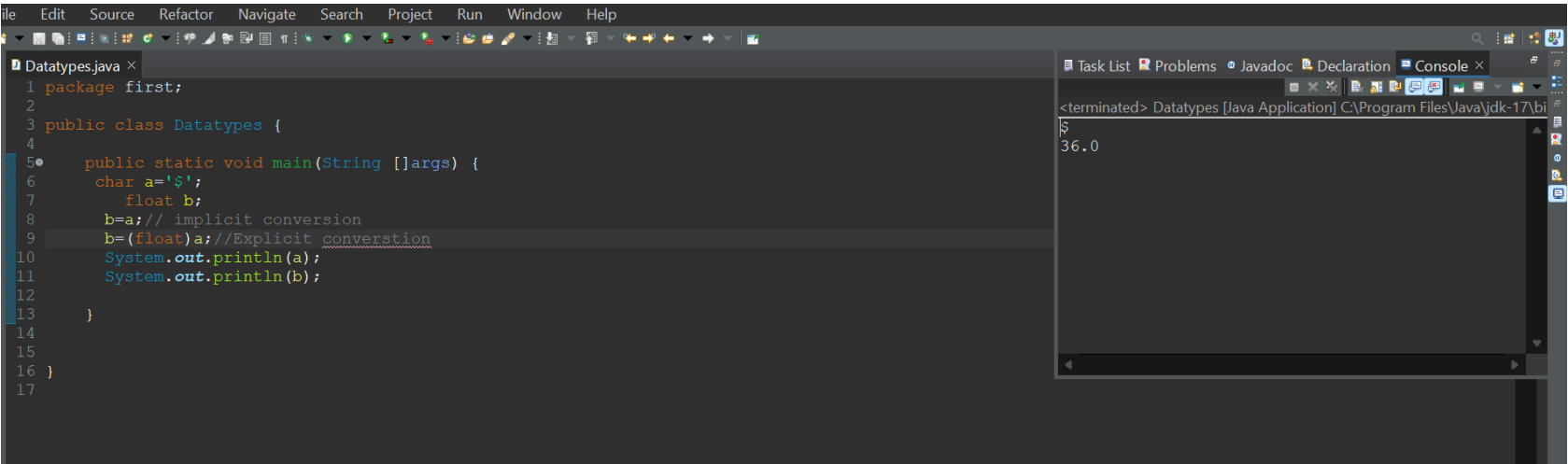
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (20-Jul-2023, 5:23:46 pm - 5:23:48 pm)
\$
36

Outline ×
first
Datatypes
main(String[]) : void

Char to double



Char to float



Char to Boolean

```
package first;

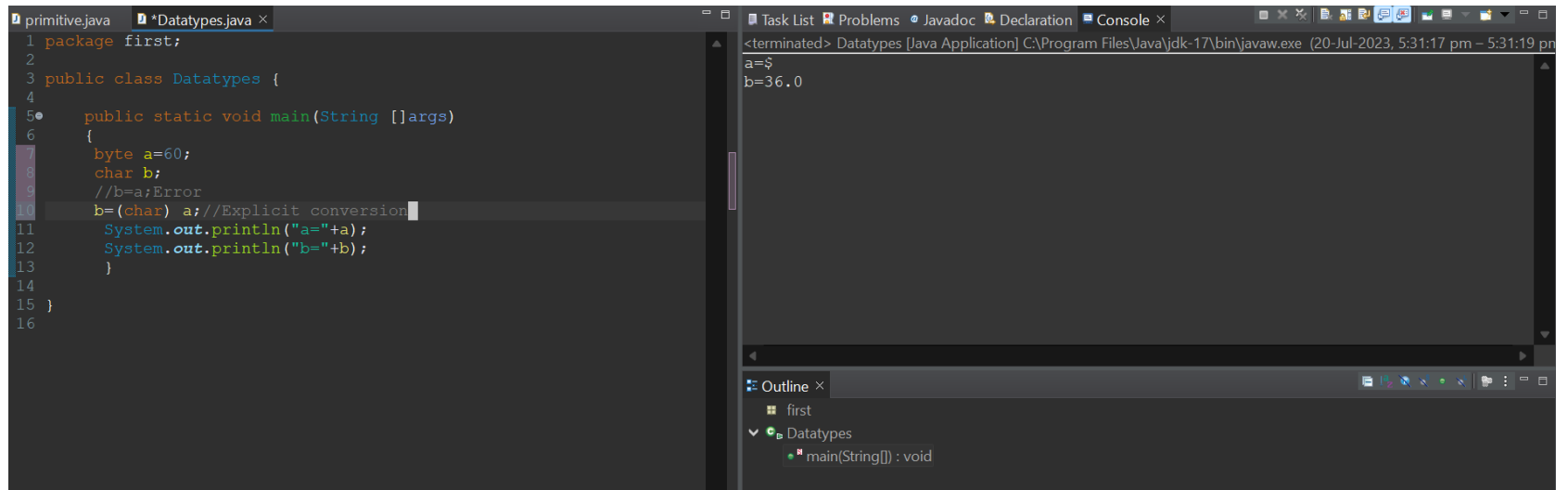
public class Datatypes {

    public static void main(String []args) {
        char a='$';
        boolean b;
        b=a;//Error in implicit conversion
        b=(boolean)a;//Error in explicit conversion
        System.out.println(a);
        System.out.println(b);

    }

}
```

Byte to char



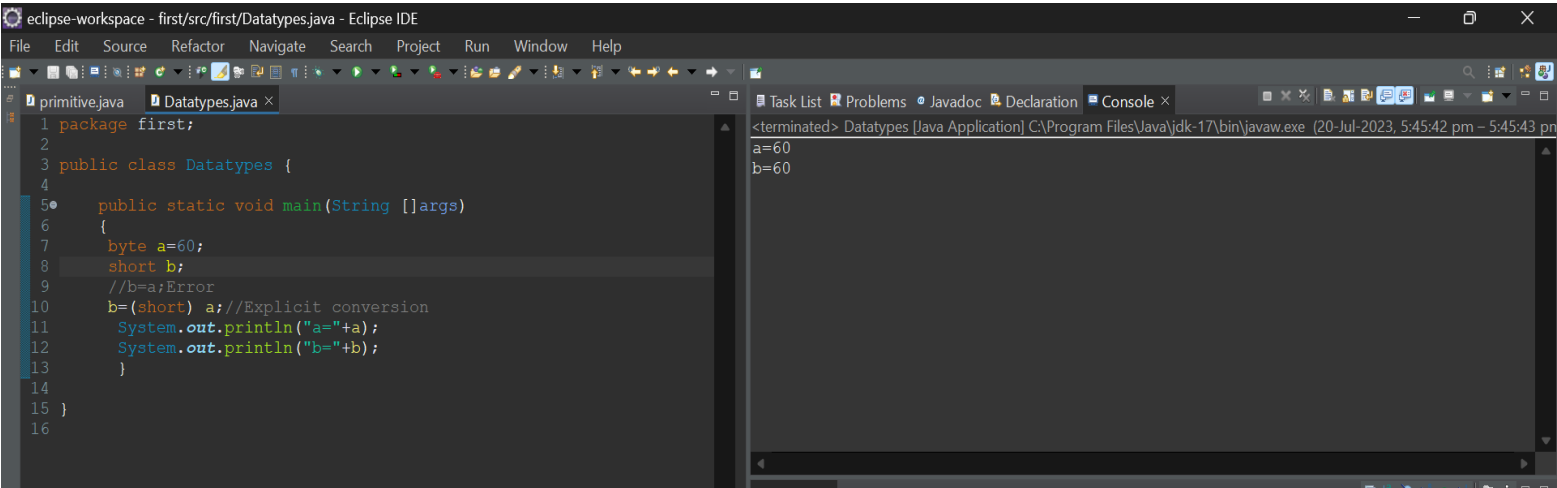
The screenshot shows an IDE with a Java file named `Datatypes.java`. The code defines a class `Datatypes` with a `main` method. Inside `main`, a `byte` variable `a` is assigned the value 60, and a `char` variable `b` is declared. A comment indicates that an implicit conversion from `byte` to `char` is an error. The code then performs an explicit conversion: `b = (char) a;`. Finally, it prints the values of `a` and `b` using `System.out.println`. The IDE's console window on the right shows the output: `a=$` and `b=36.0`. The Outline view at the bottom right shows the class structure: `first` package containing the `Datatypes` class with a `main(String[]) : void` method.

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         byte a=60;
8         char b;
9         //b=a;Error
10        b=(char) a;//Explicit conversion
11        System.out.println("a="+a);
12        System.out.println("b="+b);
13    }
14 }
15
16
```

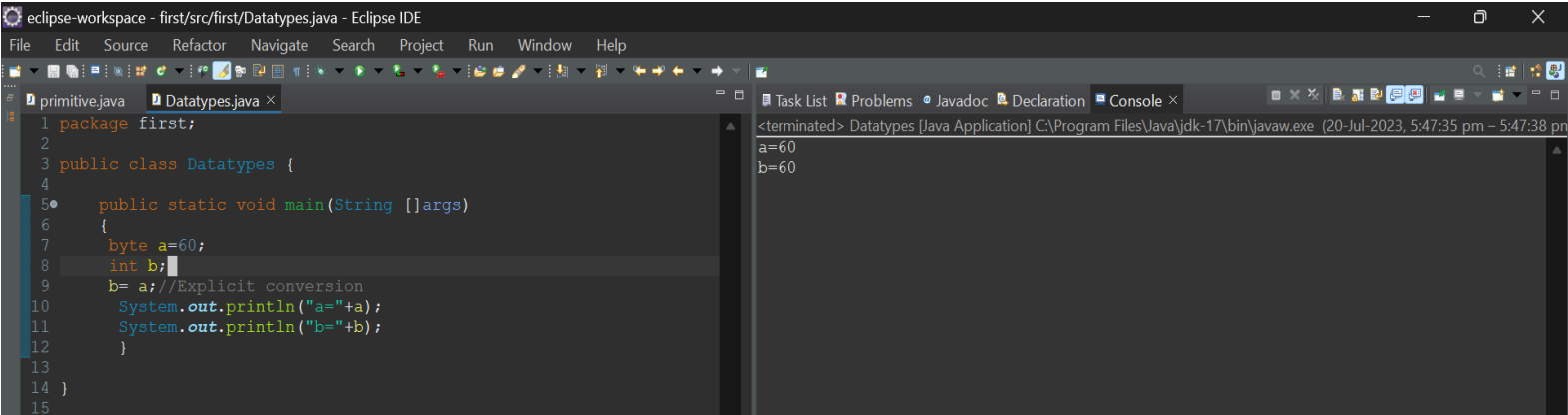
Task List Problems Javadoc Declaration Console ×
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (20-Jul-2023, 5:31:17 pm – 5:31:19 pm)
a=\$
b=36.0

Outline ×
first
▼ Datatypes
 main(String[]) : void

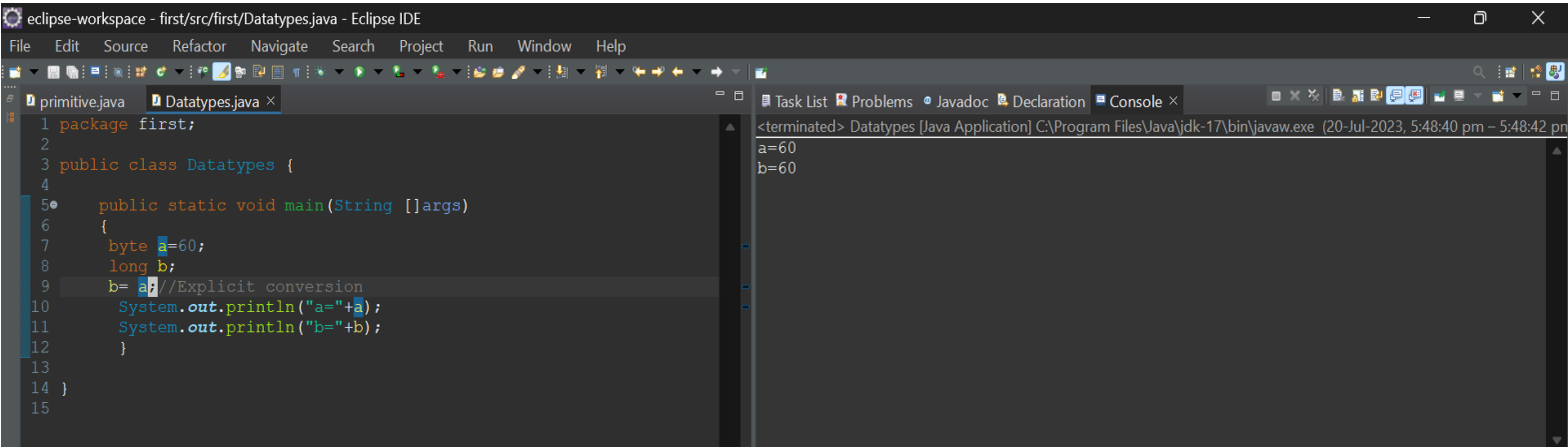
Byte to short



Byte to int



Byte to long



Byte to float

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         boolean a=true;
7         float b;
8         b=a;//Error in implicit and explicit conversion
9         System.out.println(a);
10        System.out.println(b);
11    }
12
13 }
```

Byte to double

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         byte a=60;
8         double b;
9         b= a;//Explicit conversion
10        System.out.println("a="+a);
11        System.out.println("b="+b);
12    }
13 }
```

<terminated>
a=60
b=60.0

Byte to Boolean

```
Datatypes.java x
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         byte a=60;
7         boolean b;
8         b=a;//Error in implicit conversion
9         b=(boolean)a;//Error in explicit conversion
10        System.out.println(a);
11        System.out.println(b);
12    }
13
14 }
```


Short to char

```
package first;

public class Datatypes {

    public static void main(String []args)
    {
        short a=2311;
        char b;
        b= (char) a;//Explicit conversion
        System.out.println("a="+a);
        System.out.println("b="+b);
    }
}
```

<terminated> Datatypes
a=2311
b=ξ

Short to byte

```
package first;

public class Datatypes {

    public static void main(String []args)
    {
        short a=2311;
        byte b;
        b= (byte) a;//Explicit conversion
        System.out.println("a="+a);
        System.out.println("b="+b);
    }
}
```

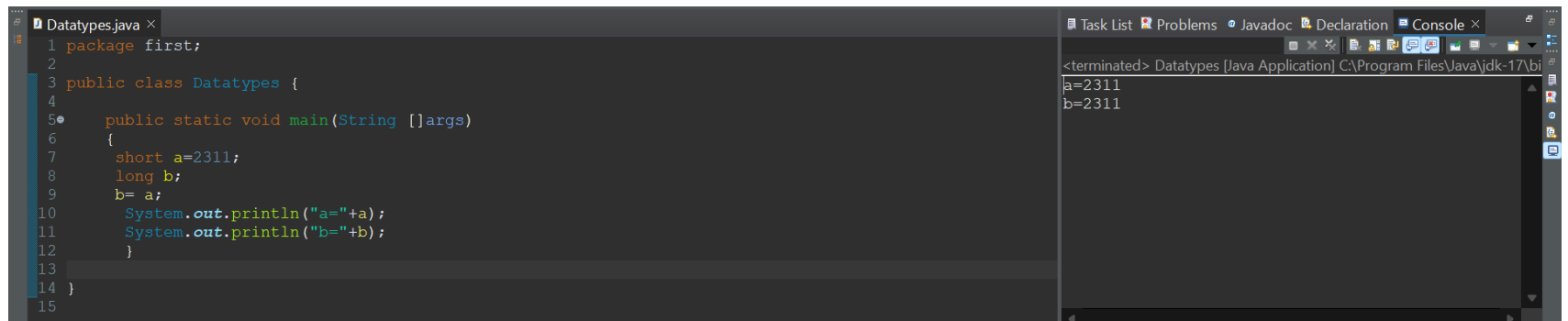
<terminated> Datatypes
a=2311
b=7

Short to int

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         short a=2311;
8         int b;
9         b= a;
10        System.out.println("a="+a);
11        System.out.println("b="+b);
12    }
13 }
14 }
15 }
```

<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=2311
b=2311

Short to long

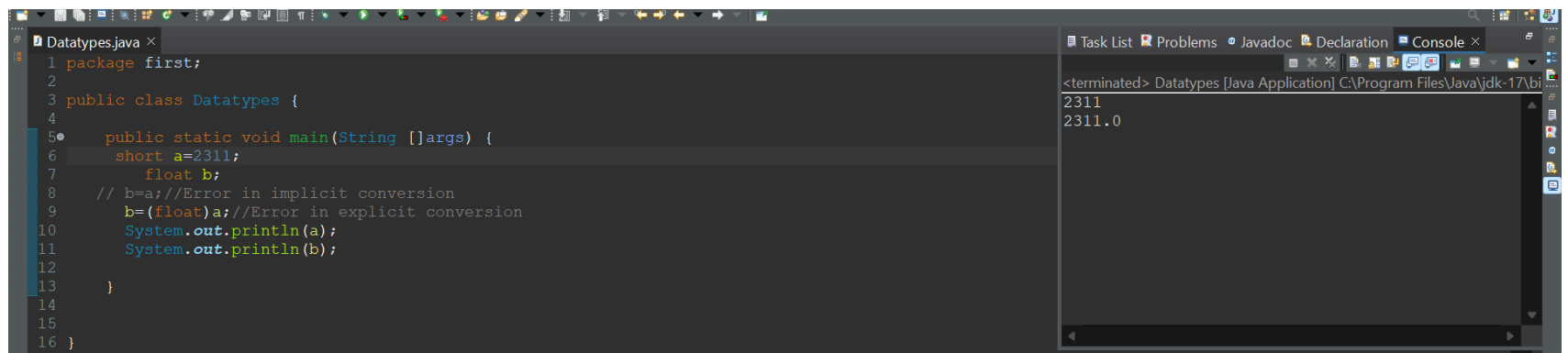


```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         short a=2311;
8         long b;
9         b= a;
10        System.out.println("a="+a);
11        System.out.println("b="+b);
12    }
13
14 }
15
```

Task List Problems Javadoc Declaration Console ×

<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=2311
b=2311

Short to float

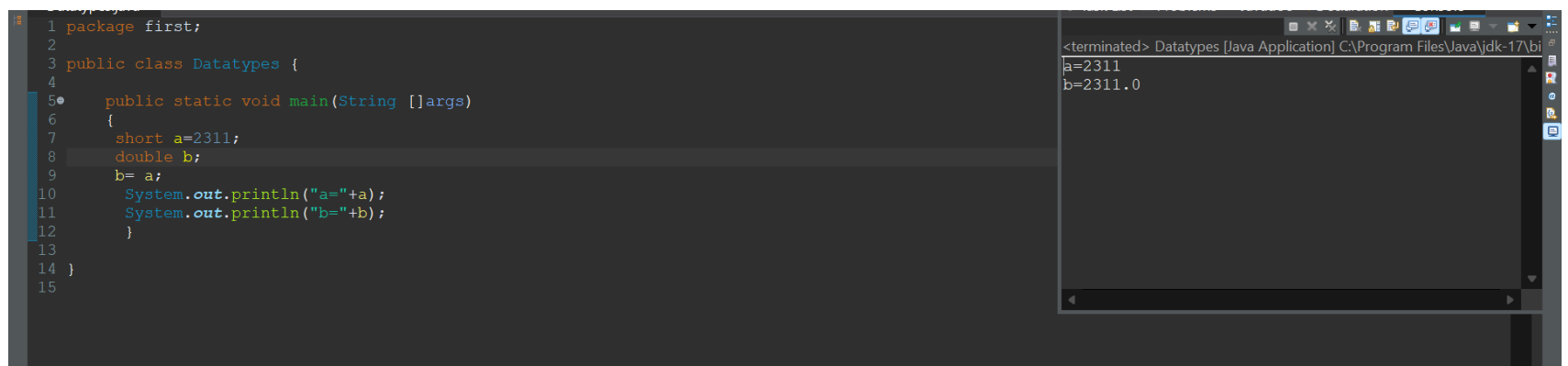


```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         short a=2311;
7         float b;
8         // b=a;//Error in implicit conversion
9         b=(float)a;//Error in explicit conversion
10        System.out.println(a);
11        System.out.println(b);
12    }
13
14 }
15
16 }
```

Task List Problems Javadoc Declaration Console ×

<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
2311
2311.0

Short to double



```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         short a=2311;
8         double b;
9         b= a;
10        System.out.println("a="+a);
11        System.out.println("b="+b);
12    }
13
14 }
15
```

Task List Problems Javadoc Declaration Console ×

<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=2311
b=2311.0

Short to Boolean

```
Datatypes.java x
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         short a=2311;
8         boolean b;
9         b= a;//Error while casting
10        System.out.println("a="+a);
11        System.out.println("b="+b);
12    }
13
14 }
15
```

Int to char

```
Datatypes.java x
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         int a=34241;
8         char b;
9         //b=a;//Error
10        b= (char) a;//Explicit type casting
11        System.out.println("a="+a);
12        System.out.println("b="+b);
13    }
14 }
```

Task List Problems Javadoc Declaration Console x
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=34241
b=葉

Int to byte

```
Datatypes.java x
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         int a=34241;
8         byte b;
9         //b=a;//Error
10        b= (byte) a;//Explicit type casting
11        System.out.println("a="+a);
12        System.out.println("b="+b);
13    }
14
15 }
```

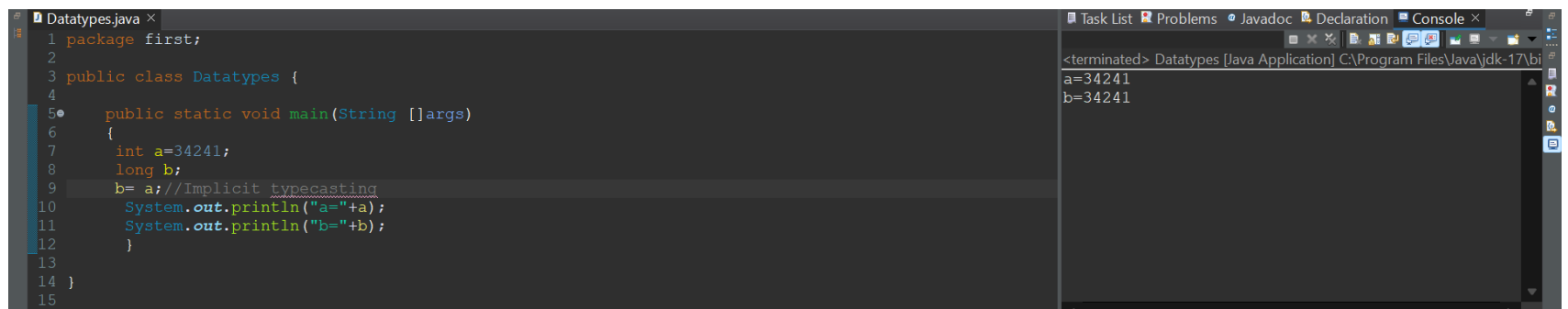
Task List Problems Javadoc Declaration Console x
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=34241
b=-63

Int to short

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         int a=34241;
8         short b;
9         //b=a;//Error
10        b= (short) a;//Explicit type casting
11        System.out.println("a="+a);
12        System.out.println("b="+b);
13    }
14
15 }
```

Task List Problems Javadoc Declaration Console x
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=34241
b=-31295

Int to long

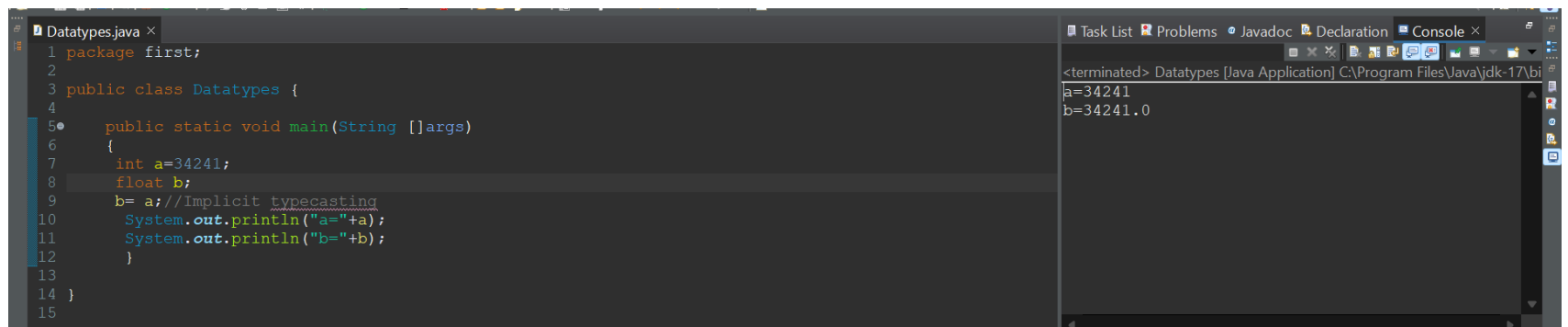


The screenshot shows an IDE with a Java file named `Datatypes.java`. The code defines a package `first` and a class `Datatypes` with a `main` method. Inside `main`, an `int` variable `a` is assigned the value 34241. A `long` variable `b` is then assigned the value of `a`, with a comment indicating implicit typecasting. Both variables are printed to the console. The console output on the right shows the program terminated successfully, with `a=34241` and `b=34241` printed.

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         int a=34241;
8         long b;
9         b= a;//Implicit typecasting
10        System.out.println("a="+a);
11        System.out.println("b="+b);
12    }
13 }
14 }
15 }
```

Console Output:
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=34241
b=34241

Int to float

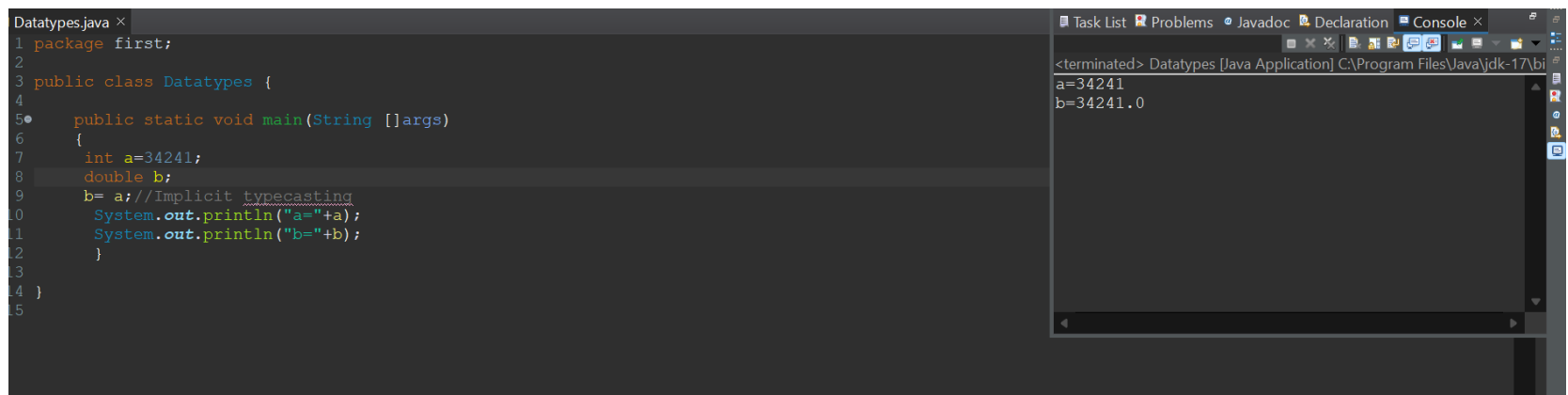


The screenshot shows the same IDE with `Datatypes.java`, but the variable `b` is now of type `float`. The code and console output are similar to the previous example, but the console output for `b` is `34241.0`, demonstrating the loss of precision when casting an integer to a float.

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         int a=34241;
8         float b;
9         b= a;//Implicit typecasting
10        System.out.println("a="+a);
11        System.out.println("b="+b);
12    }
13 }
14 }
15 }
```

Console Output:
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=34241
b=34241.0

Int to double



The screenshot shows the IDE with `Datatypes.java`, where the variable `b` is now of type `double`. The code and console output are similar to the previous examples, but the console output for `b` is `34241.0`, showing that the integer value is preserved as a double.

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         int a=34241;
8         double b;
9         b= a;//Implicit typecasting
10        System.out.println("a="+a);
11        System.out.println("b="+b);
12    }
13 }
14 }
15 }
```

Console Output:
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=34241
b=34241.0

Int to Boolean

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         int a=34242;
8         boolean b;
9         b= a;//Error
10        System.out.println("a="+a);
11        System.out.println("b="+b);
12    }
13
14 }
15
```

Long to char

```
Datatypes.java x
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         long a=321424765;
8         char b;
9         //b=a;//Error
10        b=(char) a;//Explicit conversion
11        System.out.println("a="+a);
12        System.out.println("b="+b);
13    }
14
15 }
16
```

Task List Problems Javadoc Declaration Console x
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=321424765
b=趙

Long to byte

```
Datatypes.java x
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         long a=321424765;
8         byte b;
9         //b=a;//Error
10        b=(byte) a;//Explicit conversion
11        System.out.println("a="+a);
12        System.out.println("b="+b);
13    }
14
15 }
16
```

Task List Problems Javadoc Declaration Console x
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=321424765
b=125

Long to short

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         long a=321424765;
8         short b;
9         //b=a;//Error
10        b= (short) a;//Explicit conversion
11        System.out.println("a="+a);
12        System.out.println("b="+b);
13    }
14
15 }
```

```
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=321424765
b=-29315
```

Long to int

```
Datatypes.java x
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         long a=321424765;
8         int b;
9         //b=a;//Error
10        b= (int) a;//Explicit conversion
11        System.out.println("a="+a);
12        System.out.println("b="+b);
13    }
14
15 }
```

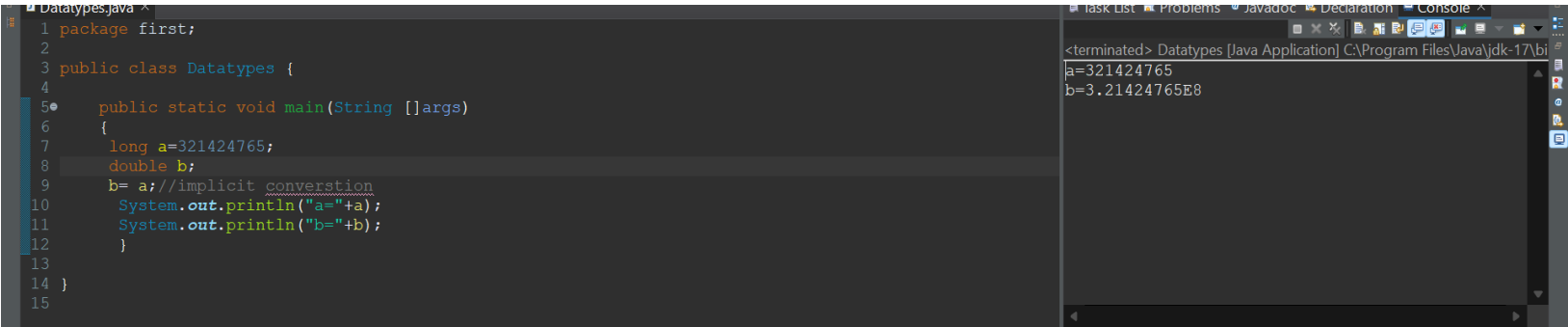
```
Task List Problems Javadoc Declaration Console x
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=321424765
b=321424765
```

Long to float

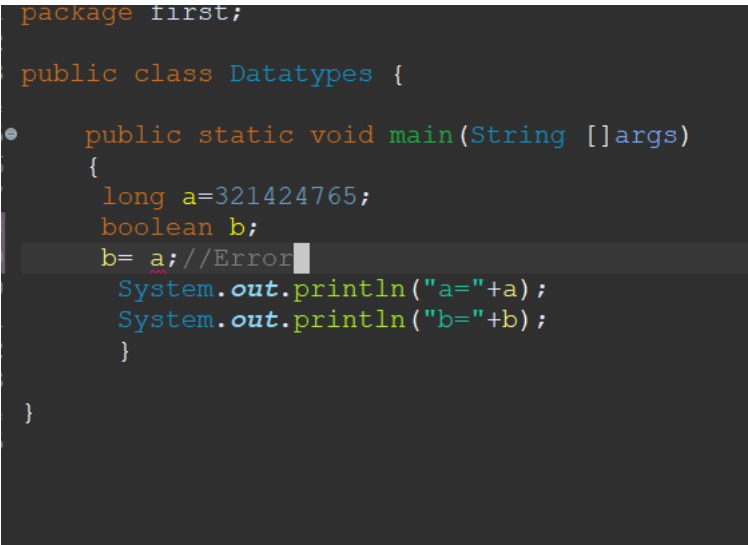
```
Datatypes.java x
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args)
6     {
7         long a=321424765;
8         float b;
9         b= a;//implicit conversion
10        System.out.println("a="+a);
11        System.out.println("b="+b);
12    }
13
14 }
15
```

```
Task List Problems Javadoc Declaration Console x
<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
a=321424765
b=3.21424768E8
```

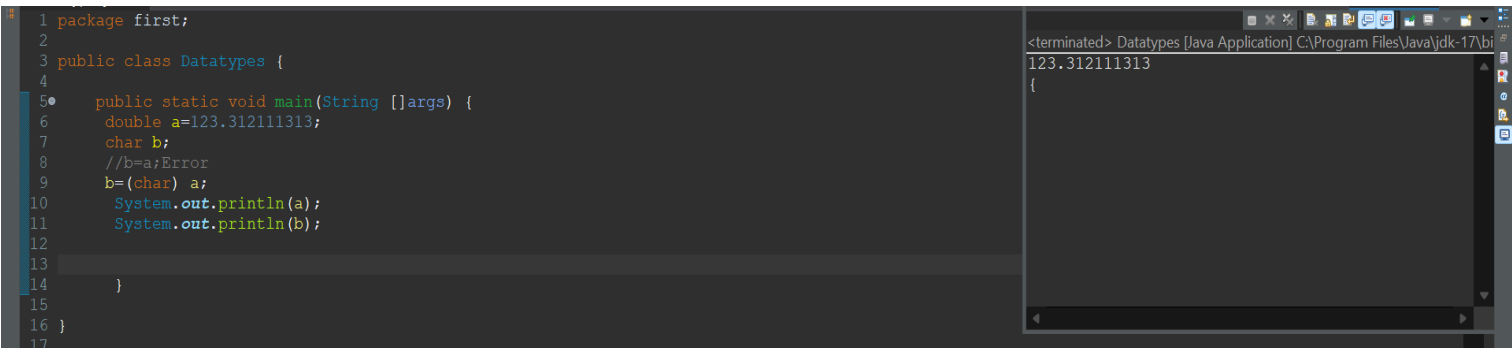
Long to double



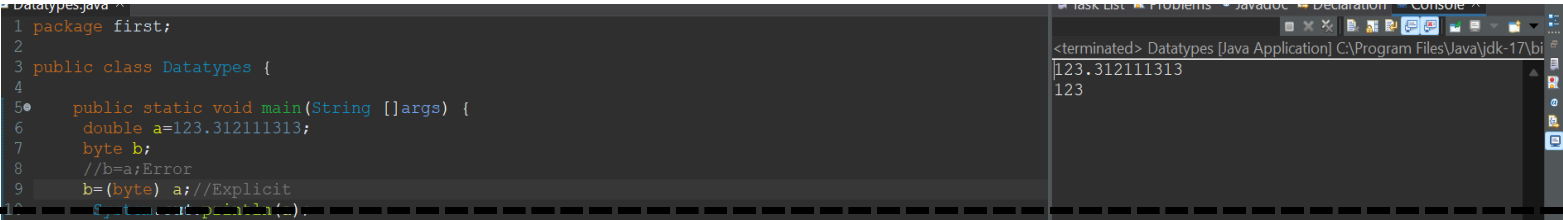
Long to Boolean



Double to char



Double to byte



Double to short

Datatypes.java x

#1 package first;
2
3 public class Datatypes {
4
5 public static void main(String []args) {
6 double a=123.312111313d;
7 short b;
8 //b=a;Error
9 b= (short) a;//Explicit conversion
10 System.out.println(a);
11 System.out.println(b);
12
13
14 }
15
16 }
17

Task List Problems Javadoc Declaration Console x

<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
123.312111313
123

Double to int

Datatypes.java x

#1 package first;
2
3 public class Datatypes {
4
5 public static void main(String []args) {
6 double a=123.312111313d;
7 int b;
8 //b=a;Error
9 b= (int) a;//Explicit conversion
10 System.out.println(a);
11 System.out.println(b);
12
13
14 }
15
16 }
17

Task List Problems Javadoc Declaration Console x

<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
123.312111313
123

Double to long

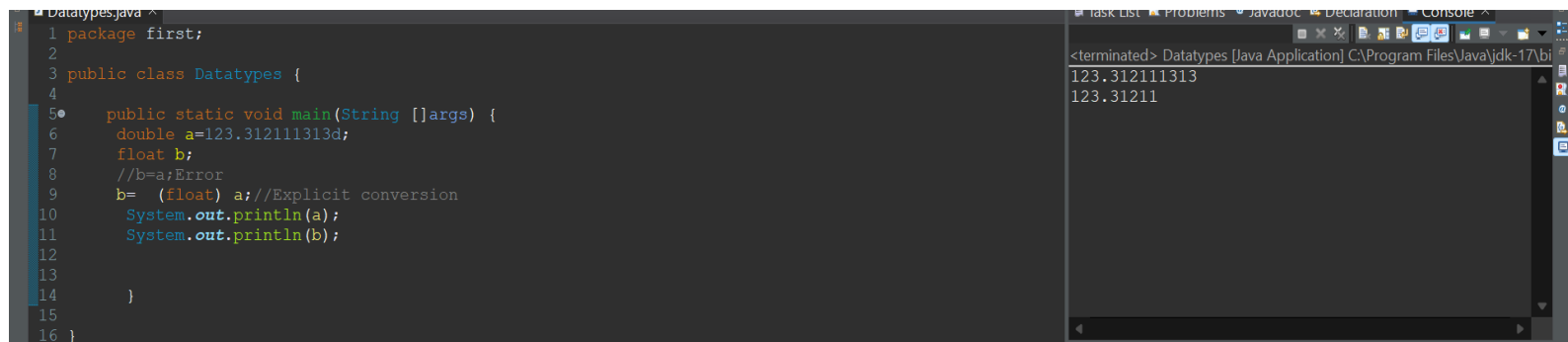
Datatypes.java x

#1 package first;
2
3 public class Datatypes {
4
5 public static void main(String []args) {
6 double a=123.312111313d;
7 long b;
8 //b=a;Error
9 b= (long) a;//Explicit conversion
10 System.out.println(a);
11 System.out.println(b);
12
13
14 }
15
16 }
17

Task List Problems Javadoc Declaration Console x

<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
123.312111313
123

Double to float

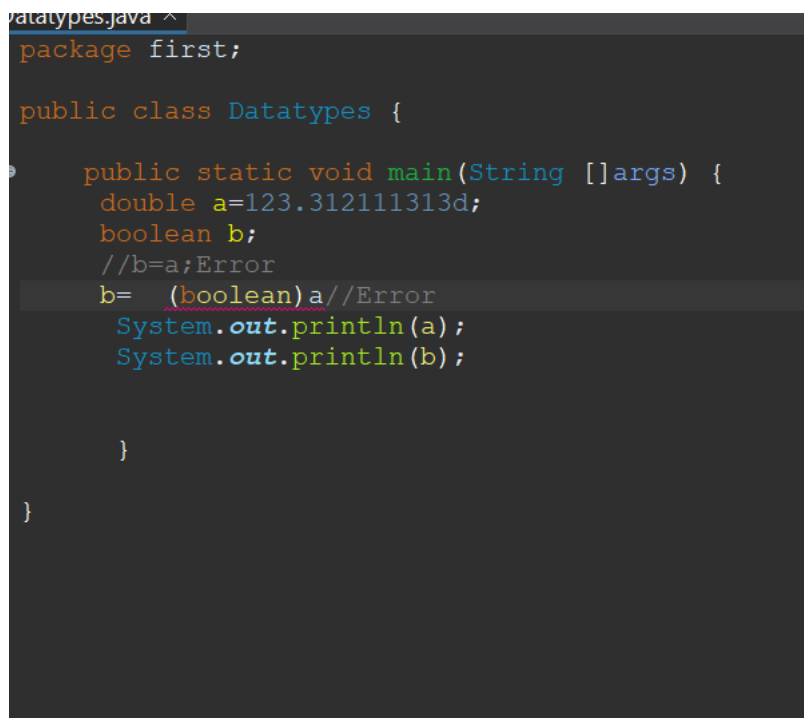


The screenshot shows an IDE with a Java file named `Datatypes.java` and a console window. The code defines a class `Datatypes` with a `main` method. It declares a `double a` with the value `123.312111313d` and a `float b`. A comment indicates that an implicit conversion from `double` to `float` would cause an error. Instead, an explicit conversion is used: `b = (float) a;`. The program prints the values of `a` and `b`. The console output shows `123.312111313` for `a` and `123.31211` for `b`, demonstrating the loss of precision when converting from `double` to `float`.

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         double a=123.312111313d;
7         float b;
8         //b=a;Error
9         b= (float) a;//Explicit conversion
10        System.out.println(a);
11        System.out.println(b);
12
13    }
14
15 }
```

<terminated> Datatypes [Java Application] C:\Program Files\Java\jdk-17\bin
123.312111313
123.31211

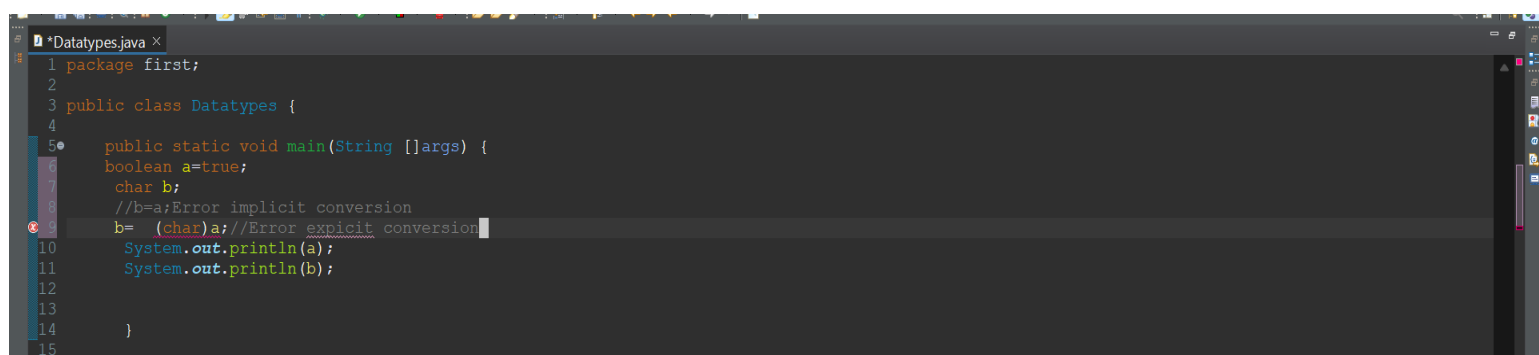
Double to Boolean



The screenshot shows an IDE with a Java file named `Datatypes.java`. The code defines a class `Datatypes` with a `main` method. It declares a `double a` with the value `123.312111313d` and a `boolean b`. A comment indicates that an implicit conversion from `double` to `boolean` would cause an error. The code attempts to assign `a` to `b` using `b = (boolean)a;`, which is marked with a red squiggly line indicating a compilation error. The program prints the values of `a` and `b`.

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         double a=123.312111313d;
7         boolean b;
8         //b=a;Error
9         b= (boolean)a//Error
10        System.out.println(a);
11        System.out.println(b);
12
13    }
14
15 }
```

Boolean to char



The screenshot shows an IDE with a Java file named `Datatypes.java`. The code defines a class `Datatypes` with a `main` method. It declares a `boolean a` with the value `true` and a `char b`. A comment indicates that an implicit conversion from `boolean` to `char` would cause an error. The code attempts to assign `a` to `b` using `b = (char)a;`, which is marked with a red squiggly line indicating a compilation error. The program prints the values of `a` and `b`.

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         boolean a=true;
7         char b;
8         //b=a;Error implicit conversion
9         b= (char)a;//Error explicit conversion
10        System.out.println(a);
11        System.out.println(b);
12
13    }
14
15 }
```

Boolean to char

```
Datatypes.java x
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         boolean a=true;
7         char b;
8         //b=a;Error implicit conversion
9         b= (char)a;//Error expicit conversion
10        System.out.println(a);
11        System.out.println(b);
12
13    }
14
15 }
16 }
```

Boolean to short

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         boolean a=true;
7         short b;
8         //b=a;Error implicit conversion OR explicit conver
9         System.out.println(a);
10        System.out.println(b);
11
12    }
13
14 }
15
16 }
```

Boolean to int

```
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         boolean a=true;
7         int b;
8         //b=a;Error in implicit conversion and explicit converstion
9         System.out.println(a);
10        System.out.println(b);
11
12    }
13
14 }
15
16 }
```

Boolean to long

```
Datatypes.java
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         boolean a=true;
7         long b;
8         b=a; //Error in implicit and explicit conversion
9         System.out.println(a);
10        System.out.println(b);
11    }
12 }
13
14
15 }
```

Boolean to float

```
package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         boolean a=true;
7         float b;
8         b=a; //Error in implicit and explicit conversion
9         System.out.println(a);
10        System.out.println(b);
11    }
12 }
13
14
15 }
```

Boolean to double

```
Datatypes.java
1 package first;
2
3 public class Datatypes {
4
5     public static void main(String []args) {
6         boolean a=true;
7         double b;
8         b=a; //Error in implicit and explicit conversion
9         System.out.println(a);
10        System.out.println(b);
11    }
12 }
13
14
15 }
```

TYPE CASTING CHART

X	char	Byte	short	int	long	float	double	boolean
Char	NCR	Y/EC	Y/EC	Y/IC	Y/IC	Y/IC	Y/IC	NIL
Byte	Y/EC	NCR	Y/IC	Y/IC	Y/IC	Y/IC	Y/IC	NIL
Short	Y/EC	Y/EC	NCR	Y/IC	Y/IC	Y/IC	Y/IC	NIL
Int	Y/EC	Y/EC	Y/EC	NCR	Y/IC	Y/IC	Y/IC	NIL
Long	Y/EC	Y/EC	Y/EC	Y/EC	NCR	Y/IC	Y/IC	NIL
Float	Y/EC	Y/EC	Y/EC	Y/EC	Y/EC	NCR	Y/IC	NIL
double	Y/EC	Y/EC	Y/EC	Y/EC	Y/EC	Y/EC	NCR	NIL
boolean	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NCR

NCR- no conversion required

Y/EC – yes, Explicit conversion

Y/IC – yes, Implicit conversion

NIL- can't convert

TYPE CASTING GRAPH

- Implicit type Casting -
byte -> short -> char -> int -> long -> float -> double
- Explicit type Casting -
double -> float -> long -> int -> char -> short -> byte