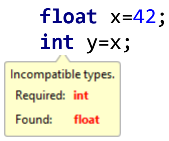
EDUMENT
Development and Mentorship

Type Conversion

Implicit and Explicit casting
The Convert Class

Type conversions

Since Java is **strictly statically-typed**, you cannot re-declare a variable to hold another data-type.



```
float x=42;
int y=x;
```

Incompatible types.
Required: int
Found: float

However, we can **convert** some data types to others.

Implicit conversion

An **implicit** conversion is where no special syntax is required. Java can convert it for you.

An example of this would be:

```java
// Implicit conversion from int to float
int integerNum = 42;
float floatNum = integerNum;
```

Conversion

What happens if we try to do this in the opposite direction?

```java
// Trying to convert float to int
float floatNum = 42.7f;
int integerNum = floatNum;
```

```
Incompatible types.
 Required:   int
 Found:      float
```

Again, we get the same error. We can solve this with an **explicit** conversion.

Explicit conversion

An **explicit** conversion requires a **conversion operator** to be defined.

A **float** can be **cast** to an integer with the following syntax:

```
// Explicit conversion from float to int
float floatNum = 42.7f;
int integerNum = (int)floatNum;
```

Explicitly converting a float to an int through casting

Explicit conversion

In the interface module we had this interface and class:

```
public interface Shape {
    double area();
    double perimeter();
}
```

```
public class Circle implements Shape {
    private double radius;

    public Circle(double radius) {
        this.radius = radius;
    }

    @Override public double area() {
        return Math.PI * radius * radius;
    }

    @Override public double perimeter() {
        return Math.PI * 2 * radius;
    }
}
```

In Java we can cast between these two types like:

circle1..4 all contains the same object

```
Shape circle1 = new Circle(30);
Circle circle2 = (Circle)circle1;

Shape circle3 = (Shape)circle2; //Casting here is not necessary
Shape circle4 = circle2;
```

Explicit vs Implicit Conversion

- **Implicit** conversions
  are used when the conversion is **type safe**, meaning there’s nothing that can go wrong and data can’t be lost.

- **Explicit** conversions
  are used when there’s the risk of failure or data loss. We can always cast a **float** to an **int**, but we will likely lose information.

Exercise 22

Let's do exercise 22