

# COMP 250

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## INTRODUC TER SCIENCE

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Week 4-2: OOD5 th

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Giulia Alberini, Fall 2020

# WHAT ARE WE GOING TO DO IN THIS VIDEO?



OOD5

- The Object class

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# THE Object CLASS

- Object is the only class in java without a superclass. All other classes have one and only one direct superclass.
- In the absence of any other superclass, every class is implicitly a subclass of Object.

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<https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html>

## METHODS FROM `Object`

Here are some of the methods from the `Object` class:

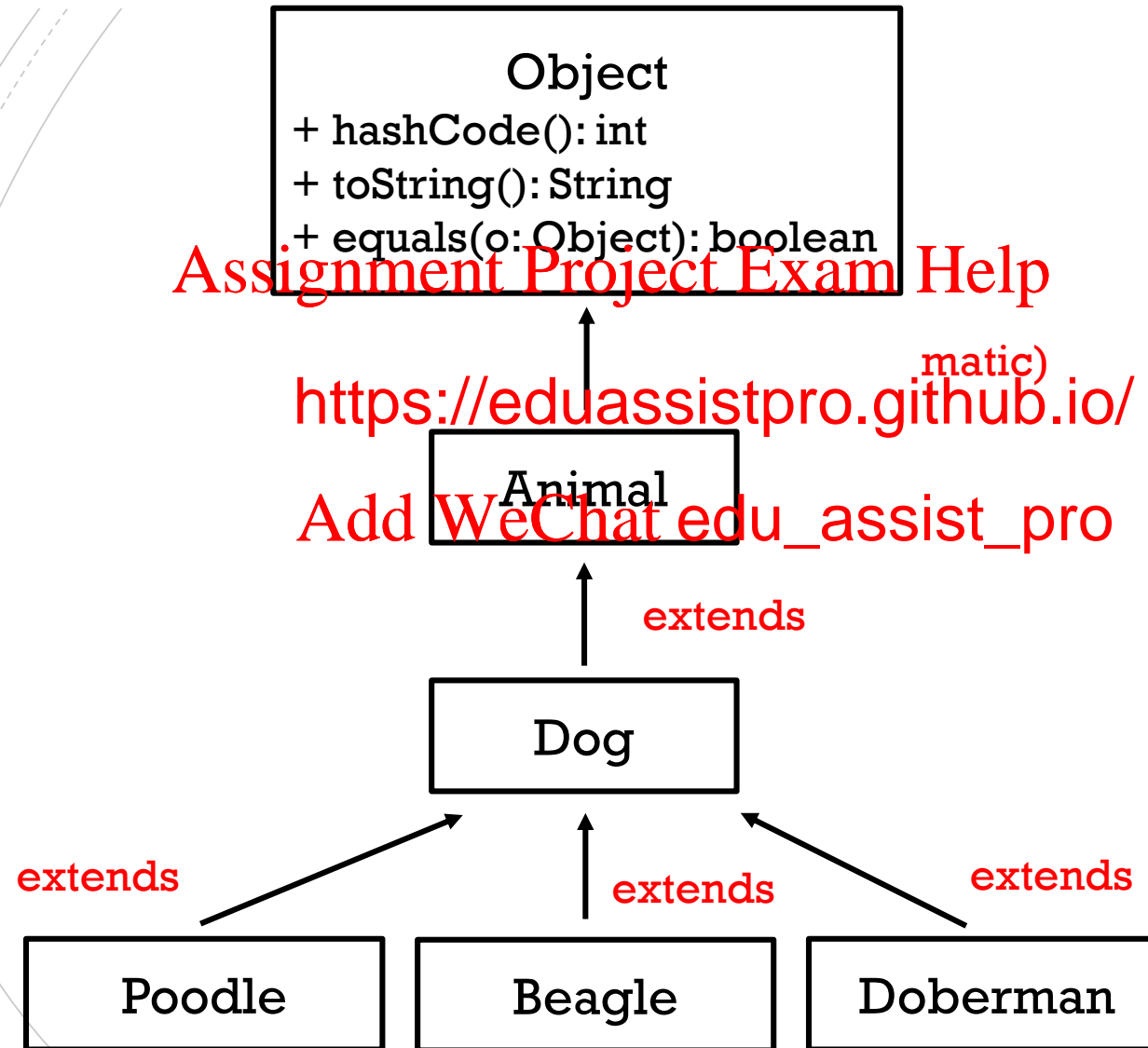
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<https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html>

## HIERARCHY FOR OUR EXAMPLES



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+ toString(): Stri

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+ equals(o: Obj

## hashCode () - RETURN VALUE

- It returns a 32 bit integer associated to this object.

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- “typically implemented as the numerical address of the object into an integer, but this is not required by the Java™ programming language”.

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- Use of hashCode() method : Returns a hash value that is used to search object in a collection.



## hashCode () - REQUIREMENTS

- “Whenever it is invoked on the same object more than once during an execution of a Java application, the hashCode method must consistently return the same integer.”

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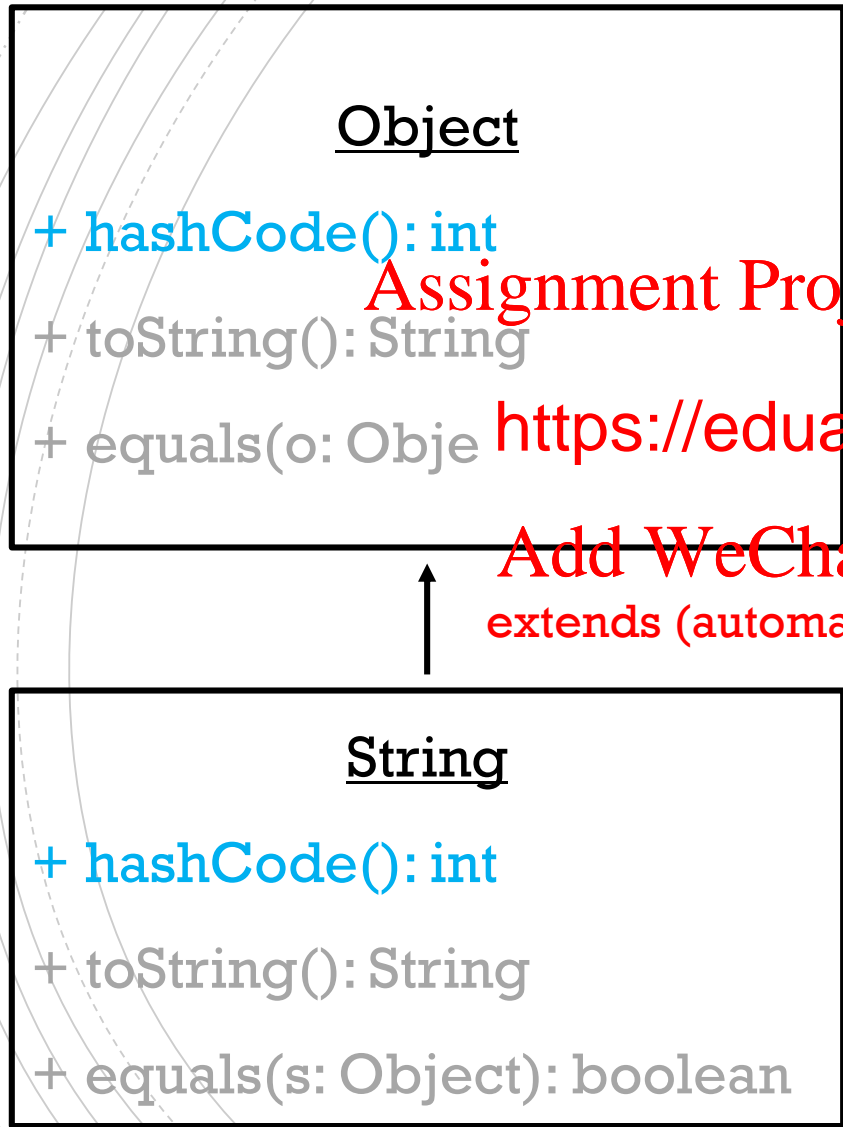
- If `o1.equals(o2)` is true, then `o1.hashCode() == o2.hashCode()` should also be true.

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Note that the converse does not need to hold!

<https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#hashCode-->

## EXAMPLE



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extends (automatic)

The class `String`  
overrides `hashCode()`

## EXAMPLE

The method `hashCode()` from the class `String`

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<https://docs.oracle.com/javase/7/docs/api/java/lang/String.html>

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+ toString(): Stri

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+ equals(o: Obj

toString()

- Returns a string representation of the object.

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- It is recommended that this method.

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- The toString() method for class Obj returns a string consisting of the name of the class of which the object is an instance, the at-sign character '@', and the unsigned hexadecimal representation of the hash code of the object.

## EXAMPLE

```
System.out.println( new Object() );
```

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What does this print?

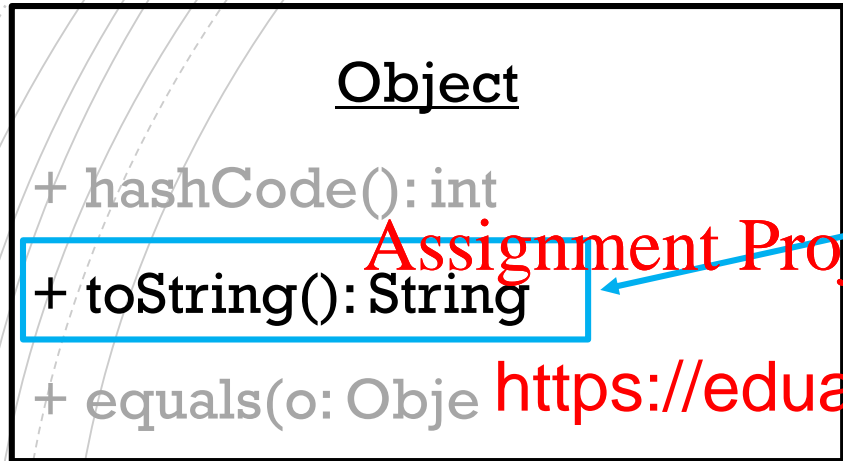
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```
java.lang.Object@7852e922
```

package + class name

32 bit integer represented in hexadecimal

## EXAMPLE



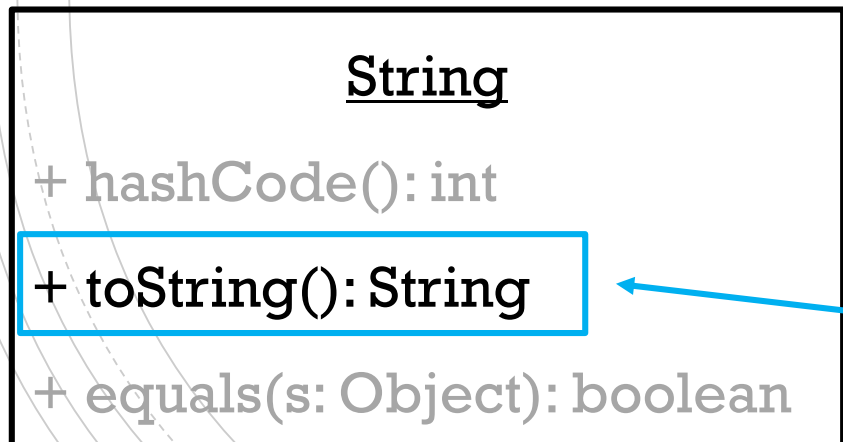
Returns the following:

```
className + "@" +  
er.toHexString(hashCode())
```

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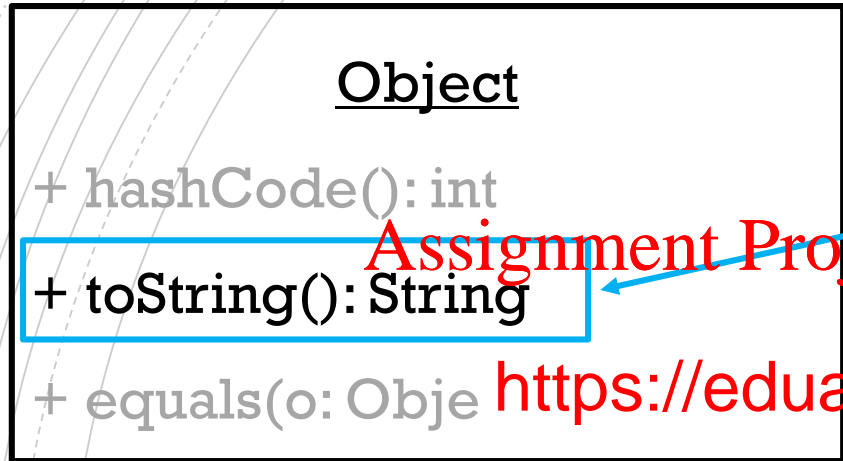
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toString() is overridden  
in the class String

Returns the object itself

## EXAMPLE



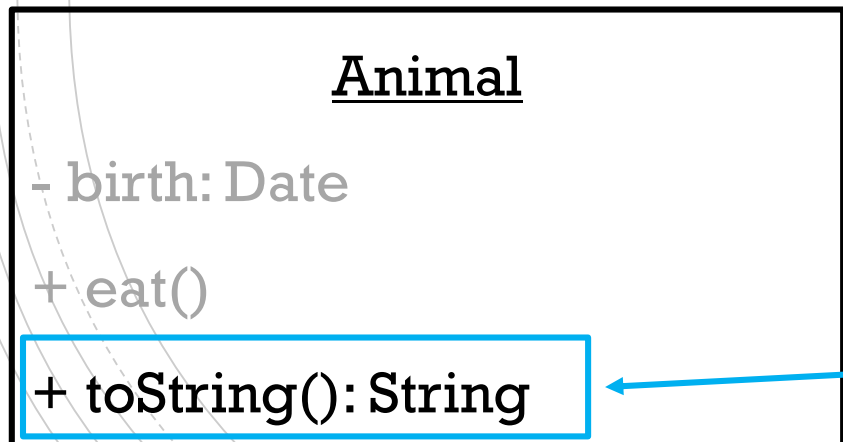
Returns the following:

```
className + "@" +  
er.toHexString(hashCode())
```

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extends (automatic)



toString() is overridden  
in the class Animal

Returns... depends on your  
implementation!



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+ toString(): Stri

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+ equals(o: Obj

<https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html>

equals ()

see MATH 240

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## `equals()` – IMPLEMENTATION

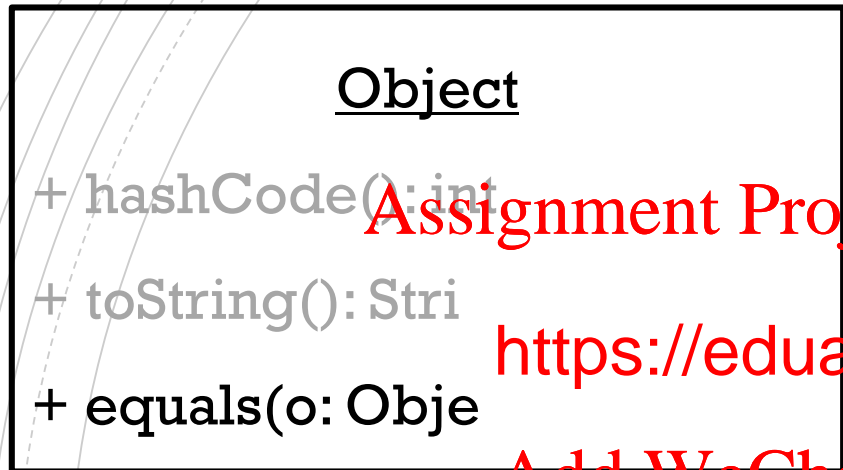
For any non-null reference values `obj1` and `obj2`,

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`obj1` `==` `obj2` `return true`  
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`obj1 == obj2` `return true`

## EXAMPLES

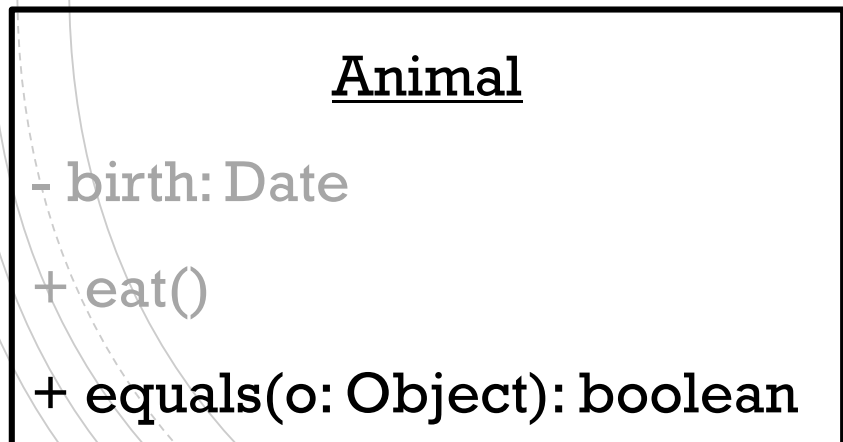


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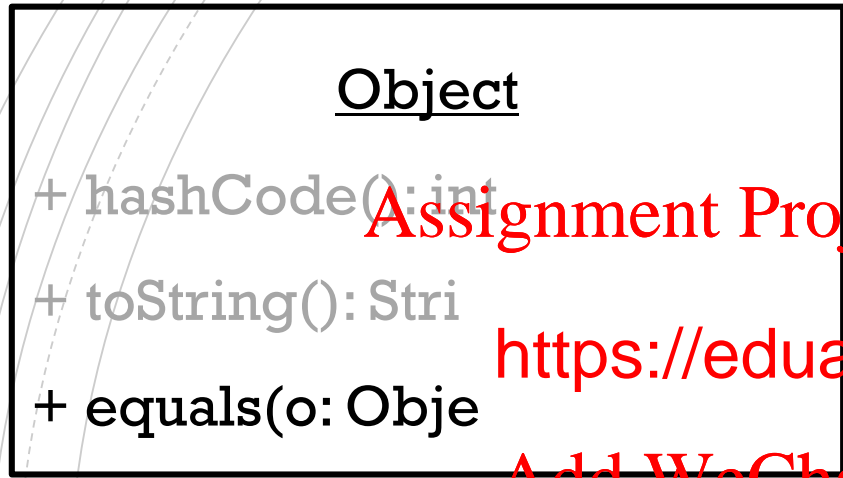
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extends (automatic)



Animal **overrides** the  
equals () **method**

## EXAMPLES

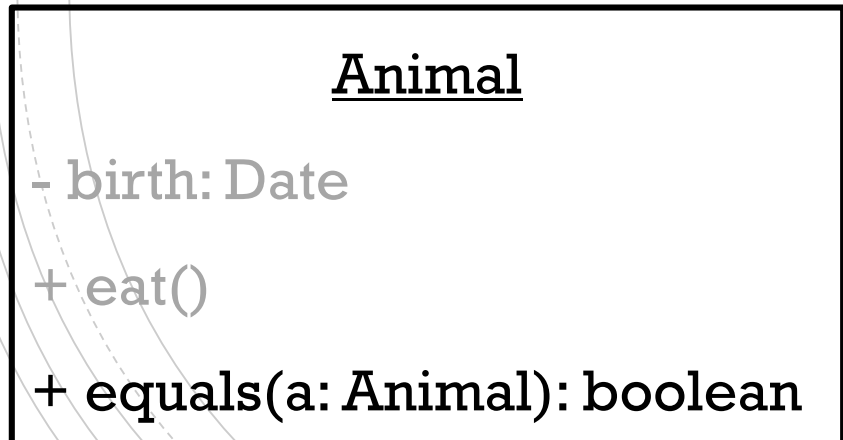


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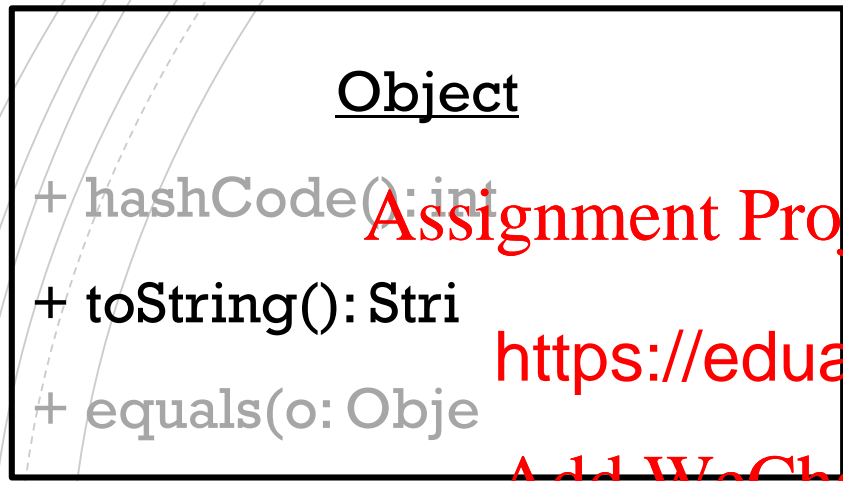
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extends (automatic)



Animal **overloads** the  
equals () method

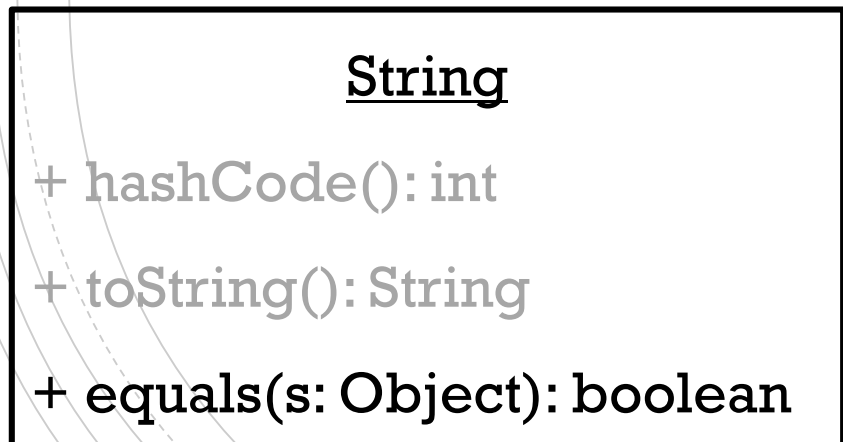
## EXAMPLES



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extends (automatic)



String **overrides** the  
equals () **method**

equals () **FROM** String

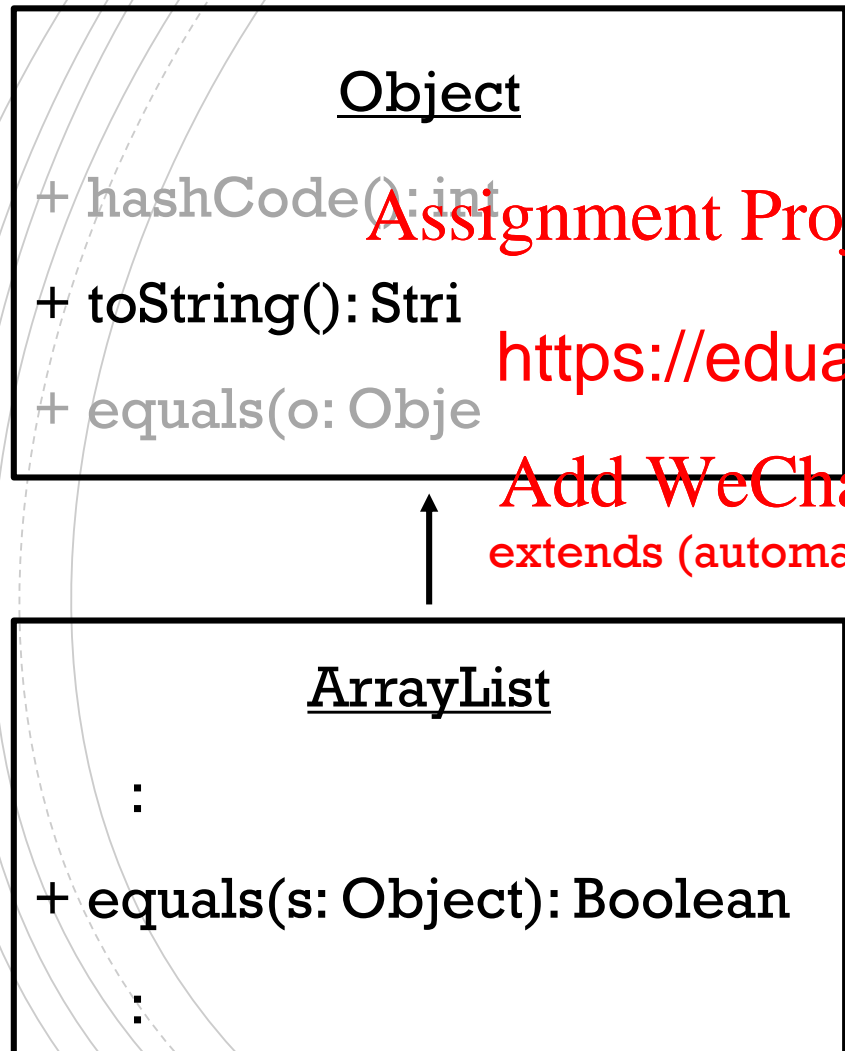
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## EXAMPLES



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extends (automatic)

`ArrayList` inherits an overridden version of the `equals()` method

**Methods inherited from interface `java.util.List`**

`containsAll`, `equals`, `hashCode`



equals () **FROM** List

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## TO LOOK FORWARD TO

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- We will be talking more about interfaces like `List` in a couple of weeks!

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An orange paint roller with a red handle, positioned horizontally. The roller is partially filled with orange paint, and there are orange paint splatters and drips around it. The text "Coming Soon" is written in white on the orange background of the roller.

# Coming Soon

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In the next

- Modifier <https://eduassistpro.github.io/>
- Type Conversion [Add WeChat edu\\_assist\\_pro](#)