CS1102S Java Puzzler: Animal Farm

```java
public class AnimalFarm {
    public static void main(String[] args) {
        final String pig = "length: 10";
        final String dog = "length: " + pig.length();
        System.out.println("Animals are equal: "
                                + pig == dog);
    }
}
```

What does this program print? Should be Animals are equal: **true**, right?

Answer

The actual print out is: **false**, not even Animals are equal: **false**!.

Operator Precedences (again)

The operator + has higher precedence than ==.
    Thus

```java
System.out.println("Animals are equal: "
                        + pig == dog);
```

means

```java
System.out.println(
    ("Animals are equal: " + pig) == dog
);
```

Equality

If we fix the operator precedence problem using parentheses as in:

```java
System.out.println("Animals are equal: "
                        + (pig == dog));
```

we would expect the print out to be: Animals are equal: **true**. To understand the correct answer Animals are equal: **false**, we need to look at the operator == in more detail.

For primitive data types, == implements literal equality. It tests whether the values are identical (to the bit).

For object references (such as references to String objects), == checks whether the references refer to the same object.

The two `String` references do not refer to the same object. They only contain the same characters. Thus the print out for the program

```java
public class AnimalFarm {
    public static void main(String[] args) {
```

```
        final  String  pig = "length:_10";
        final  String  dog = "length:_" + pig.length();
        System.out.println("Animals_are_equal:_"
                                   + (pig == dog));
    }
}
```

will be Animals are equal: **false**.