

## CSE 331 Section 5 Equals & hashCode Worksheet **Sample Solution**

1. Consider the following class `Thing`, which, unfortunately, doesn't properly override `equals`, but overloads it instead.

```
class Thing {
    private int contents;
    public Thing(int value) { this.contents = value; }

    public boolean equals(Thing other) {
        return this.contents == other.contents;
    }
}
```

Now, here is a program that uses class `Thing`. After each `System.out.println` statement, indicate which `equals` method is called (`Object.equals` or `Thing.equals`), and whether the statement prints `true` or `false`. Circle the right choices.

```
public static void main(String[] args) {
    Thing t = new Thing(17);
    Object o = t;
    Thing u = new Thing(17);
    System.out.println(t.equals(o));
    //
    // method called: Object.equals Thing.equals
    //
    // output: true false
    //
    System.out.println(t.equals(u));
    //
    // method called: Object.equals Thing.equals
    //
    // output: true false
    //
    System.out.println(o.equals(u));
    //
    // method called: Object.equals Thing.equals
    //
    // output: true false
    //
    System.out.println(u.equals(o));
    //
    // method called: Object.equals Thing.equals
    //
    // output: true false
    //
    System.out.println(u.equals((Thing) o));
    //
    // method called: Object.equals Thing.equals
    //
    // output: true false
    //
}
```

(continued on next page)

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2. Here is a small class with a correctly overridden equals method.

```
class Blob {
    private int size; private int weight; private String color;

    /** equality for Blobs. Two Blobs are the same
     * if they have the same size and weight. */
    @Override
    public boolean equals(Object o) {
        if (!(o instanceof Blob)) {
            return false;
        }
        Blob b = (Blob) o;
        return this.size == b.size && this.weight == b.weight;
    }
}
```

Below are five possible hashCode functions for Blob. For each one indicate if it is incorrect (does not satisfy the specification for hashCode), or if it is correct but very poor, or correct and adequate to good. Circle the right answers.

Hints: ^ is the exclusive-or arithmetic operation. Recall that if `a.equals(b)` is true, then `a.hashCode()` must equal `b.hashCode()`.

```
public int hashCode() { return size; }
```

Not correct    Correct but very poor    **Correct and adequate to good**

```
public int hashCode() { return color.hashCode(); }
```

**Not correct**    Correct but very poor    Correct and adequate to good

```
public int hashCode() { return 42; }
```

Not correct    **Correct but very poor**    Correct and adequate to good

```
public int hashCode() {
    return size ^ weight ^ color.hashCode();
}
```

**Not correct**    Correct but very poor    Correct and adequate to good

```
public int hashCode() { return size ^ weight; }
```

Not correct    Correct but very poor    **Correct and adequate to good**