Methods (toString, equals)

The toString() method
- tells Java how to convert an object into a String
- called when an object is printed or concatenated to a String:
  ```java
  Point p = new Point(7, 2);
  System.out.println(p: " + p);
  ```
  - Same as:
    ```java
    System.out.println("p: " + p.toString());
    ```
- Every class has a toString(), even if it isn’t in your code.
  - The default is the class's name and a hex (base-16) hash-code:
    ```java
    Point@9e8c34
    ```

toString() implementation

```java
public String toString() {
    code that returns a suitable String;
}
```
- Example: toString() method for our Student class:
  ```java
  public String toString()
  {
    return "name: " + name + "\n" + "id: " + id + "\n" + "average: " + average;
  }
  // SHOW Eclipse example of Student class
  ```
toString in ArrayLists and other collections call toString automatically
- ArrayList<Student> students = new ArrayList<>();
- ...
  ```java
  System.out.println(students);
  ```
- println(students) calls students.toString(), which automatically calls s.toString() for every point s
  ```java
  // SHOW Eclipse example of Student class
  ```

Primitive Equality
- Suppose we have two integers i and j
- How does the statement i==j behave?
- i==j if i and j contain the same value

Object Equality
- Suppose we have two pet instances pet1 and pet2
- How does the statement pet1==pet2 behave?
Object Equality

- Suppose we have two pet instances `pet1` and `pet2`.
- How does the statement `pet1==pet2` behave?
- `pet1==pet2` is true if both refer to the same object.
- The `==` operator checks if the addresses of the two objects are equal.
- May not be what we want!

Object Equality - extended

- If you want a different notion of equality define your own `.equals()` method.
- Use `pet1.equals(pet2)` instead of `pet1==pet2`.
- The default definition of `.equals()` is the value of `==` but for Strings the contents are compared.

.equals for the Pet class

```java
public boolean equals (Object other) {
    if (!other instanceof Pet) {
        return false;
    }
    Pet otherPet = (Pet) other;
    return ((this.age == otherPet.age) && Math.abs(this.weight - otherPet.weight) < 1e-8) && this.name.equals(otherPet.name));
}
```

// SHOW ECLIPSE EXAMPLE OF Equals code.