Peer Instruction #10: Methods, Classes, Data, Objects

Classes versus Objects

Which of the following statements are correct?

1) A class is basically a template for making an object.
2) Instantiation does not require memory allocation.
3) Instantiation makes a class from an object.
4) Many objects can be made from a single class.
5) Only a single object can be made from a single class.

A. 1) and 3)
B. 1) and 4)
C. 2) and 3)
D. 2) and 4)
E. 1) and 5)

Object Instantiation

Which of the following does not correctly instantiate an object of type Scanner?

A. Scanner scan = new Scanner();
B. Scanner scan = new Scanner("Hello There");
C. Scanner scan = new Scanner(System.in);
D. Scanner scan = new Scanner(new File("input.txt"));
E. Scanner scan = new Scanner("123.4567");

Public versus Private

Which of the following statements is correct?

A. Public variables and methods cannot be accessed outside the class in which they are defined.

B. Private variables can be accessed outside the class only by writing ‘getter’ or ‘setter’ methods.

C. Private methods cannot be non-static, but public methods can be, and both can be static.

D. Private methods comprise the ‘interface’ provided to users of the class.

E. If you instantiate a class you can access both private and public variables.

Public and Private

Static versus Non-static Data

Which of the following statements is correct?

A. Static data is also called instance data, and non-static data is called class data.

B. Instance data is identified by the static keyword, and only one copy exists.

C. There is a separate copy of instance data for every object that is instantiated.

D. Accessing class data using the class name instead of the object name is not a good practice.

E. Accessing instance data does not require use of the class name, if done from within the same class.

(Non)Static Data

Static versus Non-static Methods

Which of the following statements are correct?

A. Static methods are also called instance methods, and non-static method are called class methods.

B. Instance methods are identified by the static keyword, and they can access class or instance data.

C. There is a separate copy of each instance method for every object that is instantiated.

D. Accessing class methods using the instance name is discouraged in Java.

E. Calling class methods requires use of the class name, even if the call is done from within the same class.

(Non)Static Methods

Putting it all together!

What does the following code print?

```
public class Peer {
    static int i = 11;
    int j = 22;
    public static void main(String args[]) {
        Peer p1 = new Peer();
        Peer p2 = new Peer();
        p1.i = 33; p1.j = 44; p2.i = 55; p2.j = 66;
        System.out.println(p1.i+“ ”+p1.j+“ ”+p2.i+“ ”+p2.j);
    …
```

A. 11 44 11 66
B. 33 44 55 66
C. 55 44 55 66
D. 55 66 55 66
E. Will not compile