# SCJA Exercises Day 3

- **Multiple Choice**

In today's lab we give questions covering the following topics:

- Implementing Interfaces
- Arrays and Multiplicities
- Instance Methods
- Manipulating Data
- Standard Development Toolkit

- **Coding Questions**
  - Following an online tutorial: http://www.freejavaguide.com/corejava.htm
  - Today try running and understanding the code examples in Parts 1 and 2 (you can skip the HelloWorld section)
  - Feel free to continue on with the tutorial in your own time

## Multiple Choice

### Implementing Interfaces

1.How many interfaces can a class implement directly?

A. Zero
B. One
C. Two
D. As many as it needs

2. Which of the following statements are true?
Select all correct answers:

a. A class can extend more than one class

b. A class can implement more than one interface

c. An interface can extend more than one interface

d. An interface can implement more than one interface

3. Interfaces overcome the Java limitation of:
a) Many to many relationships
b) Single inheritance
c) polymorphism
d) Inheriting from Object class

4. Fill in the blanks: classes.....interfaces, while interfaces can.....other interfaces.
a) extend, extend
b) extend, implement
c) implement, implement
d) implement, extend

**Answers:**

1. Answer:
D Unlike extending other classes, a class can implement as many interfaces as it needs. A, B, and C are incorrect.

2. Answer:
b. and c. are correct.

3. Answer:
B

4. Answer:
D

**Arrays and Multiplicities**

1. Which of the following statements about the School and Student classes are true?

```
class Student {}
class School {
        private Student student[];
}
```

Select all correct answers:
a. A School is associated with one Student
b. A School is associated with many Students
c. The School class implements multiplicity using an array
d. student[] is navigable through the School class

2. Which of the following statements about the Employee and Task classes are true?

```
public class Employee implements java.io.Serializable {
        private Task task;
        public void setTask(Task task) {
                this.task = task;
        }
}
```

Select all correct answers:
a. An Employee is associated with one Task
b. The Employee class implements multiplicity using an array
c. The Employee class must be declared abstract
d. Task is navigable through the Employee class

3. How many objects are referenced in this code segment?

```
int numberOfTrees = 5;
Integer ageOfFarm = 14;
float averageHeightOfTrees = 124.2f
Tree treeType;
int[] heightOfEachTree;
```

A. 0
B. 1
C. 2
D. 3
E. 4
F. 5

,

4. What is the correct way to create an array with five int data types? (Choose all that apply.)

A. int intArray = new int[5];
B. int intArray = new int(5);
C. int[] intArray = new int[5];
D. int intArray[] = new int[5];

**Answers**

1.Answer:
b. and c. are correct.

2 Answer:
a. is correct.

3. Answer:
D. Integer, Tree, and int[] are all references to objects. Remember an array is an object. A, B, C, E and F are incorrect.

4. Answer:
C and D. C is the preferred way to declare an array. D is correct but does not follow standard conventions. A and B are incorrect.

**Instance Methods**

1. You need to create a method called findTotal. This method should take three arguments that are of type int. This method will return an int. Which of the following is the correct method declaration for this scenario?
   A. int findTotal(int, int, int){...}
   B. findTotal(int num1, int num2, int num3) return int{...}
   C. int findTotal(int num1, int num2, int num3) return int{...}
   D. int findTotal(int num1, int num2, int num3) {...}

2. A method needs to be created that accepts an array of floats as an argument and does not return any variables. The method should be called setPoints. Which of the following method declarations is correct?
   A. setPoints(float[] points) {...}
   B. void setPoints(float points) {...}
   C. void setPoints(float[] points) {...}
   D. float setPoints(float[] points) {...}

3. Objects are passed by _____.

   A. Value
   B. Reference

4. Primitives are passed by _____.

   A. Value
   B. Reference

5. When a method uses void to indicate it does not return a value, then a return statement is not required.
   A. True
   B. False

**Answers**

1 Answer:
D . A method declaration should be an optional modifier followed by the return data type, and then the method's name with a list of parameters. The parameters must be comma delimited and contain both their data type and name. A , B, and C are incorrect. A is incorrect because it is missing the names of the parameters. B is incorrect because it is missing the return type and places an incorrect return after the parameter list. C is incorrect because it has an incorrect return after the parameter list.

2 Answer:
C . void must be used for methods that do not return any data. A, B, and D are incorrect. A is incorrect because it is missing the return type. If the method is not going to return a variable, it still must use void. B is incorrect because it does not have an array of floats as a parameter. D is incorrect because it uses the incorrect return type.

3 Answer:
B . Objects are always passed to methods by reference. This means changes made to the object in the method will be reflected in the object in the code that invoked the method. A is incorrect.

4 Answer:
A . Primitives are always passed to methods by value. This means that a copy is made and then given to the method. Changes made in the method will not affect the variable that was passed to the method. B is incorrect.

5 Answer:
A. A return statement is not needed if the method does not return a variable. However, one can be used.

**Manipulating Data**

1. When performing the modulus operation: int remainder = x % 99; which of the following statements are true, assuming x is a valid int?

    a) The remainder will never be less than 99
    b) The remainder will never exceed 98
    c) The remainder will never be 0
    d) The remainder will never be negative

2. Given the following variable declarations, which of the following will print out the number 5?
   int x = 6; int y = 4; int z = 1;
    a) System.out.println(--x);
    b) System.out.println(x--);
    c) System.out.println(y+1);
    d) System.out.println(3 + x % 4);
    e) System.out.println(x % 4 + 3);

3. Given the initialization,
   int x = 10;
   x += 5; is the equivalent of:
    a) 20
    b) x = x + 5;
    c) x = = x + 5;
    d) x = 5;

4. What is the problem with the following code?
   int x;
   int y = x++;
    a) y has not been initialized
    b) x has not been initialized
    c) x has not been declared
    d) x has not been typed

**Answers**

Answer 1: b
Answer 2: a, c, d and e
Answer 3: b
Answer 4: b

**Standard Development Toolkit**

1. Given a file name called HelloWorld.java in the bin directory, which of the following commands would properly compile this code?

a) java HelloWorld
b) javac HelloWorld
c) java HelloWorld.java
d) javac HelloWorld.java
e) java HelloWorld.class
f) javac HelloWorld.class

2 . Given a successfully compiled class called HelloWorld.java, and assuming that the HelloWorld.java source file contains an executable main method, which one of the following would be the proper way to run the file?

a) java HelloWorld
b) javac HelloWorld
c) java HelloWorld.java
d) javac HelloWorld.java
e) java HelloWorld.class
f) javac HelloWorld.class

3. Which of the following errors would stop a compiled Java source file named HelloWorld.java from running properly?

a) main method was spelled Main in the source code
b) command used to run the program was java HelloWorld
c) command used to run the program was java Helloworld
d) the HelloWorld.java file does not include a package statement

4. Which of the following mistakes would stop a Java source file, with a class declaration of :

public class HelloWorld extends Object{}

from compiling into a Java class file?

a) the file was saved as HeloWorld.java
b) the file was compiled using javac HelloWorld.java
c) the text editor appended a .txt extension to the file name
d) the file was compiled using javac HelloWorld

5. When a Java source file is saved in a subdirectory of the classpath named com.mcnz.util, which package statement would correctly be placed at the top of the source file?

a) package com.mcnz.util.*;
b) package com.mcnz.util;
c) package "com.mcnz.util.*";
d) package com\mczn\util;

**Answers:**

1. Answer: D
2. Answer: A
3. Answer: A and C
4. Answer: A, C and D
5. Answer: B