

Java Fundamentals - Lab 3 Practice Problems

CSE 201 - Advanced Programming

NOTES:

- Write all programs within an IDE – either NetBeans or Eclipse – and feel free to utilize any features of the IDE that may help.
- **Follow the following package structure:**
`in.ac.iiitd.cse201.lab4`
- This is clearly not an exhaustive set of practice problems. Feel free to be creative and explore other alternative problem settings to program.
- Some of the problems below may require some additional exploration of the language/IDE features than those taught in the class. While every care is taken to make them closely related to the topics covered in the class, there may be some which have slipped this filter. Do not treat this as an issue, but use this to learn more about Java (take TAs help if needed).

Before you begin with programming, make sure you have:

- A working IDE – either NetBeans or Eclipse
- The latest version of Java JDK and JVM. Currently it is JDK 7 update 25 (if you have a slightly lower update value, it is OK)
- You have access to the Oracle's Java Documentation URL

Practice Problems

Problems

1. **Object class.** We discussed in the lecture that the inheritance hierarchy in Java is rooted at a special class called `Object`. Answer the following:

- (a) Is `Object` class an abstract class? How did you learn this?
- (b) If you have an array of basic types (e.g. `int`, `float`, `double`, etc.), can you call the method `toString()` on the array? If so, what is the output produced? Will the output depend on the dimensions of the array, size of the array, contents of the array, the type of elements in the array? How do you verify your hypothesis?
- (c) Consider the following array:

`{2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 101}`

containing the first few prime numbers. Develop a class called `PrimeContainer` which overrides the `equals(Object other)` method as follows: (i) If the argument is anything other than an integer array, then return `false`, (ii) if all the elements of the argument are contained in the prime number array above, then return `true`, (iii) otherwise, return `false`. (HINT: use the `instanceof` operator.)