

## Assignment 2

### 1. Why we need packages in java?

A Java package is a mechanism for organizing Java classes into namespaces similar to the modules of Modula. Java packages can be stored in compressed files called JAR files, allowing classes to download faster as a group rather than one at a time. Programmers also typically use packages to organize classes belonging to the same category or providing similar functionality.

### 2. What is the default imported package?

Java compiler imports java.lang package internally by default. It provides the fundamental classes that are necessary to design a basic Java program.

### 3. What is Class? What is Object?

A class is a user-defined type that describes what a certain type of object will look like. An object is a single instance of a class. You can create many objects from the same class type.

### 4. Why we need constructor?

A constructor is a special method of a class that initializes new objects or instances of the class. Without a constructor, you can't create instances of the class. Imagine that you could create a class that represents files, but without constructors, you couldn't create any files based on the class.

### 5. What is the default value of local variable? What is the default value of instance variable?

The default value of the local variable is NULL in JAVA, no primitive values or object references.

Instance variables have default values. For numbers, the default value is 0, for Booleans it is false, and for object references it is null. Values can be assigned during the declaration or within the constructor.

### 6. What is garbage collection?

Java garbage collection is the process by which Java programs perform automatic memory management. Java programs compile to bytecode that can be run on a Java Virtual Machine, or JVM for short. When Java programs run on the JVM, objects are created on the heap, which is a portion of memory dedicated to the program. Eventually, some objects will no longer be needed. The garbage collector finds these unused objects and deletes them to free up memory.

### 7. The protected data can be accessed by subclasses or same package. True or false?

True

### 8. What is immutable class?

Immutable class in java means that once an object is created, we cannot change its content. In Java, all the wrapper classes (like Integer, Boolean, Byte, Short) and String class is immutable. We can create our own immutable class as well.

9. What's the difference between "==" and equals method?

In simple words, == checks if both objects point to the same memory location whereas . equals() evaluates to the comparison of values in the objects. If a class does not override the equals method, then by default, it uses the equals(Object o) method of the closest parent class that has overridden this method.

10. What is wrapper class?

Wrapper classes provide a way to use primitive data types (int, boolean, etc..) as objects.

11. What is autoboxing?

Autoboxing is the automatic conversion that the Java compiler makes between the primitive types and their corresponding object wrapper classes.

12. StringBuilder is threadsafe but slower than StringBuffer, true or false? **True**

13. Constructor can be inherited, true or false? **False**

14. How to call a super class's constructor?

As we know, when an object of a class is created, its default constructor is automatically called. To explicitly call the superclass constructor from the subclass constructor, we use super() . It's a special form of the super keyword.

15. Which class is the super class of all classes?

Object class is the root or superclass of the class hierarchy, which is present in java.lang package. All predefined classes and user-defined classes are the subclasses from Object class.

16. Create a program to count how many files/folders are there inside one folder.

- the count method should take a parameter called Criteria like this:  
count(Criteria criteria){}
- For Criteria class, multiple conditions should be included such as: folder path, includeSubFolder or not, the extension of the file be counted and so on.
- Optional: Take the input from keyboard.
- Take care of the invalid inputs. Exception handling.
- Get proper result displayed.  
"There are XXX file(s) and XXX folder(s) inside folder XXX with extension XXX." or something user friendly.