

## Assignment 2

1. Why we need packages in java?

A package in Java is used to group related classes. Think of it as a folder in a file directory. We use packages to avoid name conflicts, and to write a better maintainable code.

2. What is the default imported package?

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?

an object is an element (or instance) of a class; objects have the behaviors of their class. The object is the actual component of programs, while the class specifies how instances are created and how they behave. method: a method is an action which an object is able to perform.

4. Why we need constructor?

The purpose of constructor is to initialize the object of a class while the purpose of a method is to perform a task by executing java code. Constructors cannot be abstract, final, static and synchronised while methods can be. Constructors do not have return types while methods do.

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

- The local variables do not have any default values in Java. This means that they can be declared and assigned a value before the variables are used for the first time, otherwise, the compiler throws an error.
- 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?

garbage collection (GC) is a form of automatic memory management. The garbage collector, or just collector, attempts to reclaim garbage, or memory occupied by objects that are no longer in use by the program.

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

False, only subclass

8. What is immutable class?

Immutable class 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?

== should be used during reference comparison. == checks if both references points to same location or not. equals() method should be used for content comparison.

10. What is wrapper class?

A Wrapper class is a class which contains the primitive data types (int, char, short, byte, etc). In other words, wrapper classes provide a way to use primitive data types (int, char, short, byte, 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. For example, converting an int to an Integer, a double to a Double, and so on. If the conversion goes the other way, this is called unboxing.

<https://www.geeksforgeeks.org/autoboxing-unboxing-java/>

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

false , StringBuffer is thread safe(synchronized). Thus StringBuilder is faster than the StringBuffer

13. Constructor can be inherited, true or false?

False. Constructors are not members of classes and only members are inherited.

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

super()

super() can be used only inside the subclass constructor and must be the first statement.

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

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.

```
package com.antra;

import java.io.File;

public class Criteria {
    String path, subFolder, extension;
    Criteria(String path,String subFolder,String extension){
        this.path = path;
        this.subFolder = subFolder;
        this.extension = extension;
    }

    //throws: declare an NullPointerException
    //use throw to return exception to main
    static void count(Criteria criteria)throws NullPointerException{
        File files = new File(criteria.path); //.list().length
        //System.out.println(files.list());
        int fcount=0,ecount=0,count=0;
```

```

        boolean includeSubFolder = false;
        File[] directoryListing = files.listFiles();
        if (directoryListing != null) {
            for (File child : directoryListing) {
                count++;
                if(child.isDirectory()) {
                    fcount++;
                    if(child.getName().equals(criteria.subFolder))
                        includeSubFolder=true;
                }
                if(child.getName().toLowerCase().endsWith(criteria.extension))
                    ecount++;
                //System.out.println(child.getName());
            }
            else {
                throw new NullPointerException("wrong path");
            }
            if(includeSubFolder)
                System.out.println(criteria.subFolder+" is in the folder");
            else
                System.out.println(criteria.subFolder+" is not in the
folder");
            System.out.println("There are "+count+" file(s) and "+fcount+"
folder(s) inside folder "+ecount+" with extension "+criteria.extension);
        }
        public static void main(String[] args) {
            Criteria criteria = new Criteria("E:\\Google Drive\\Antra1","New
folder1","docx");

            try {
                count(criteria);
            } catch (NullPointerException e) {
                System.err.println("wrong path");
            }
        }
    }
}

```