

HOMEWORK – 1

1-) Why we need to use OOP ? Some major OOP languages ?

OOP stands for Object Oriented Programming. OOP is one type of programming that, helps us to simplify complex code. It makes codes of others more understandable and provides a reliable, maintainable structure.

2-) Interface vs Abstract Class?

In both particular cases are used for abstraction.

- Unlike interface, an abstract class can contain abstract and non-abstract methods.
- Variables declared in an interface are final by default; in abstract classes, variables can be final or non-final.
- Unlike abstract classes, an interface can only have static and final variables.
- For interface, “implements” keyword is used. For Abstract class, “extends” is used.
- Java interface members are public by default.

3-) Why we need equals and hashCode ? When to override ?

equals() method considers the identity of an object as the parameter to be compared. Therefore, if 2 different objects contain the same values; if compared with equals(), the result will not be true.

Since, equal() method does not provide enough depth for relatively bigger projects; if one aims to compare the property of the objects, it needs to be overridden.

HashCode() returns the value of hash code of the referred object. These two methods are closely related. Hashcode returns an integer, that represents the current instance of the class. If equals() is overridden, so must hashCode().

4-) Diamond problem in Java ? How to fix it?

Java does not allow inheritance in multi-inheritance level. In Java, a class cannot inherit properties from more than one class. This problem is resolved with default methods and interfaces.

5-) Why we need Garbage Collector ? How does it run ?

Java Virtual Machine automatically determines the memory that is not being used no longer by that application and basically “recycles” the memory for other purposes.

2 types of garbage collection activity usually occurs in Java. One is called incremental garbage collection and the other is full garbage collection. Incremental applies when the objects that are unreachable in the young generation heap memory are removed.

Full garbage collection occurs when an unwanted object does not get cleaned during incremental stage. This occurs in more rare conditions.

6-) Java ‘static’ keyword usage ?

When a variable or method in a given class is shared, one can use static keyword to the desired property. The static keyword is used for constants variables and methods to make them the same for every instance.

7-) Immutability means ? Where, How and Why to use it ?

Once the constructor completes the execution for an object, that particular instance cannot be altered. This is referred to as immutability. When one needs read-only access to data, immutable classes can be used. It provides a program with objects that has no conflicts between them.

8-) Composition and Aggregation means and differences ?

These terms are related to association. It refers to the relation between 2 classes that the relation is based on their objects. In OOP, Composition and aggregation are 2 forms of association.

Composition happens when an object contains another, let's assume object A contains object B. If object B cannot exist without object A.

Aggregation is the relationship between 2 classes that can be summarized as has-a and whole / part type of relationship. The class that contains a reference to the other has an "ownership" over the other class.

9-) Cohesion and Coupling means and differences ?

Cohesion is the term that describes the level of relation and responsibilities of a software element.

Coupling is the strength of the bond of the element to the other elements.

10-) Heap and Stack means and differences ?

Stack stores the order of method execution and local variables.

On the other hand, heap stores the objects with dynamic memory allocation.

11-) Exception means ? Type of Exceptions ?

An event that happens in the occurrence of a disruption of the normal flow of a program. When this happens, the method hands this disruption to the runtime system. Runtime system searches for a block of code that can handle the given exception. There are 2 types of exceptions.

- Built-in Exceptions
- User Defined Exceptions

12-) How to summarize 'clean code' as short as possible ?

It is referred to as a type of coding that can be read by any developer and changed easily by them. It should be simple, each method and variable must have proper names according to their use. Function of a method should be apparent and every method must have one task.

13-) What is the method of hiding in Java ?

When a class and sub-class of that class, has the same method; the method in the parent class will be hidden by the method in the subclass. This is referred to as method hiding.

14-) What is the difference between abstraction and polymorphism in Java ?

Abstraction is used to hide details. For example, a person who uses a computer knows if he/she presses the power button, the computer would turn on. But that person does not know how the inner mechanics of the computer occur.

Polymorphism is the process of defining various types of objects and classes through a single term. Considering a class Car which includes Mercedes, BMW and etc. All can be referred to as Car.

