PATİKA.DEV & PAYCORE JAVA SPRING BOOTCAMP HOMEWORK 1

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1-) Why we need OOP? Some major OOP Languages?

OOP is a programming paradigm that breaks the programs into objects. OOP programs aims to group the data and create functions that interacts with related data. Also with OOP paradigm some major concepts such as class,object,abstraction,polymorphism,inherştance and encapsulation becomes possible. These features considered some foundational parts of programming of today. There are many languages support OOP style programming while most popular and known ones being Java,C++,C#,Python,PHP,Javascript.

2-)Interface vs Abstract class ?

INTERFACES:

Interface can not be instantiated.No instance variables.But public static final can be used.All methods are abstract methods.Can not create constructors and destructors. No field can not defined. Multiple implementation. Used for solving multiple inheritance issues e.g. diamond problem in Java. Always public.

ABSTRACT CLASSES:

Has abstract keyword.Should have at least one abstract method. Can have multiple concrete method. Blueprints for concrete classes.Can not be instatiated.Allows code reusability.Public and Protected methods can be created.

3 – Why wee need equals and hashcode ? When to override ?

Hashcode returns the an unique integer that related to given object. Equals method is used for comparing objects in Java. It compares the object's attributes. If two objects stored in the same memory location they are the same objects. Overriding in Java, is done when a method in a child class has the same name, same signatures and same return type in their parent class.Equals method should be overridden if there will be multiple objects that represents the same entity. When .equals() method is overridden, hashCode() method should also be overridden.

4 – Diamond problem in Java ? How to fix it?

Multiple inheritance does not exists in Java. Creating multiple inheritance structure in Java would result in compiler error. We use interfaces to solve that issue. Multiple implementation of interfaces creates a solution for diamond problem.

5 – Why we need Garbagge Collector ? How does it run ?

In some languages such as C,C++ memory management is done manually. However in languages like Java and C#, memory management done automatically. Garbage collector is a form of automatic memory management. Automatically removes unused data from the memory to free up space.

6 – Java 'static' keyword usage ?

Static is a keyword in java adds some features to added variable, class, or block. Static variable created once in the memory, can be used for common properties of that will be used for various objects. Static methods are methods inside classes that are able to be invoked without the need for a intanciation. They can access the data in the static variables. Static blocks are initializer blocks. It is executed before the main method.

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

Immutable objects are objects that can not be altered after creating the object. Most variables are mutable by default, an exception example to this are primitive data type variable. For example, i n order to make a change in a string you should create a new object. And to make variables immutable , there is a keyword in use, this is "final" keyword . Immutaility is used for thread-safety, that makes immutable objects useful in multi-threaded applications.

8 – Composition and Aggregation means and differences ?

In Java, aggregation is a type of HAS-A relationship. Both classes can idependently exist. In composition, composition object can not exist by its own independent from the other class.

9 – Cohesion and Coupling means and differences ?

Coupling is how much a class knows about other class. It can be tight coupling or loose coupling. Cohesion stands for how a class defined for spesific function to do. Like coupling there exists tight cohesion and loose coupling types. Contradictory to coupling, tight cohesion is considered better alternative to loose cohesion, in coupling loose coupling considered the better design alternative.

10 - Heap and Stack means and differences ?

Stack is a special part of the computer's memory used for temporary storage memory. When the task is complete data will be erased from memory. Methods,local variables, and reference variables makes up most of the stack. Heap is the memory where program stores global variables. Heap memory stores all global variables by default. It supports dynamic memory allocation, and not managed automatically. Heap variables can be resized.

11 – Exception means ? Type of Exceptions ?

Exceptions are disruptions in the execution of the program. There are 12 type of built-in exceptions in Java. These are ArithmeticException, ArrayIndexOutOfBoundsException, ClassNotFoundException, FileNotFoundException, IOException, InterruptedException, NoSuchFieldException, NoSuchMethodException, NullPointerException, NumberFormatException, RuntimeException, StringIndexOutOfBoundsException.

12 – How to summarize 'clean code' as short as possible ?

Clean Code is a code written in readable, changeable, extensible, maintainable format.

13 - What is the method of hiding in Java ?

Method hiding is when sub class has static methods with same signature as in the super class, method that's in the subclass hiding the method on the super class.

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

Abstraction is a concept that makes it view things in more general term, creates flexibility. Polymorphism on the other hand makes it possible for methods to work differently on different classes. Polymorphism is possible with overriding and overloading, while abstraction done with interfaces and abstract classes.