Java Based Interview questions

Q1 .Why is Java not a pure object oriented language?

Java supports primitive data types - byte, boolean, char, short, int, float, long, and double and hence it is not a pure object-oriented language.

Q2 .What are the differences between JVM, JRE and JDK in Java?

Criteria	JDK	JRE	JVM
Abbreviation	Java Development Kit	Java Runtime Environment	Java Virtual Machine
Definition	JDK is a complete software development kit for developing Java applications. It comprises JRE, JavaDoc, compiler, debuggers, etc.	JRE is a software package providing Java class libraries, JVM and all the required components to run the Java applications.	JVM is a platform-dependent, abstract machine comprising of 3 specifications - document describing the JVM implementation requirements, computer program meeting the JVM requirements and instance object for executing the Java byte code and provide the runtime environment for execution.
Main Purpose	JDK is mainly used for code development and execution.	JRE is mainly used for environment creation to execute the code.	JVM provides specifications for all the implementations to JRE.
Tools provided	JDK provides tools like compiler, debuggers, etc for code development	JRE provides libraries and classes required by JVM to run the program.	JVM does not include any tools, but instead, it provides the specification for implementation.
Summary	JDK = (JRE) + Development tools	JRE = (JVM) + Libraries to execute the application	JVM = Runtime environment to execute Java byte code.

Q3 .How many types of memory areas are allocated by JVM?

Many types:

1. **Class(Method) Area:** Class Area stores per-class structures such as the runtime constant pool, field, method data, and the code for methods.

2. **Heap:** It is the runtime data area in which the memory is allocated to the objects
3. **Stack:** Java Stack stores frames. It holds local variables and partial results, and plays a part in method invocation and return. Each thread has a private JVM stack, created at the same time as the thread. A new frame is created each time a method is invoked. A frame is destroyed when its method invocation completes.
4. **Program Counter Register:** PC (program counter) register contains the address of the Java virtual machine instruction currently being executed.
5. **Native Method Stack:** It contains all the native methods used in the application.

Q4 .What is JIT compiler?

Just-In-Time(JIT) compiler: It is used to improve the performance. JIT compiles parts of the bytecode that have similar functionality at the same time, and hence reduces the amount of time needed for compilation. Here the term “compiler” refers to a translator from the instruction set of a Java virtual machine (JVM) to the instruction set of a specific CPU.

Q5 .What are wrapper classes in Java?

Wrapper classes convert the Java primitives into the reference types (objects). Every primitive data type has a class dedicated to it. These are known as wrapper classes because they “wrap” the primitive data type into an object of that class. Refer to the below image which displays different primitive type, wrapper class and constructor argument.

Q6 .Why pointers are not used in Java?

Java doesn’t use pointers because they are unsafe and increases the complexity of the program. Since, Java is known for its simplicity of code, adding the concept of pointers will be contradicting. Moreover, since JVM is responsible for implicit memory allocation, thus in order to avoid direct access to memory by the user, pointers are discouraged in Java.

Q7 .What is Object Oriented Programming?

Object-oriented programming or popularly known as OOPs is a programming model or approach where the programs are organized around objects rather than logic and functions. In other words, OOP mainly focuses on the objects that are required to be manipulated instead of logic. This approach is ideal for the programs large and complex codes and needs to be actively updated or maintained.

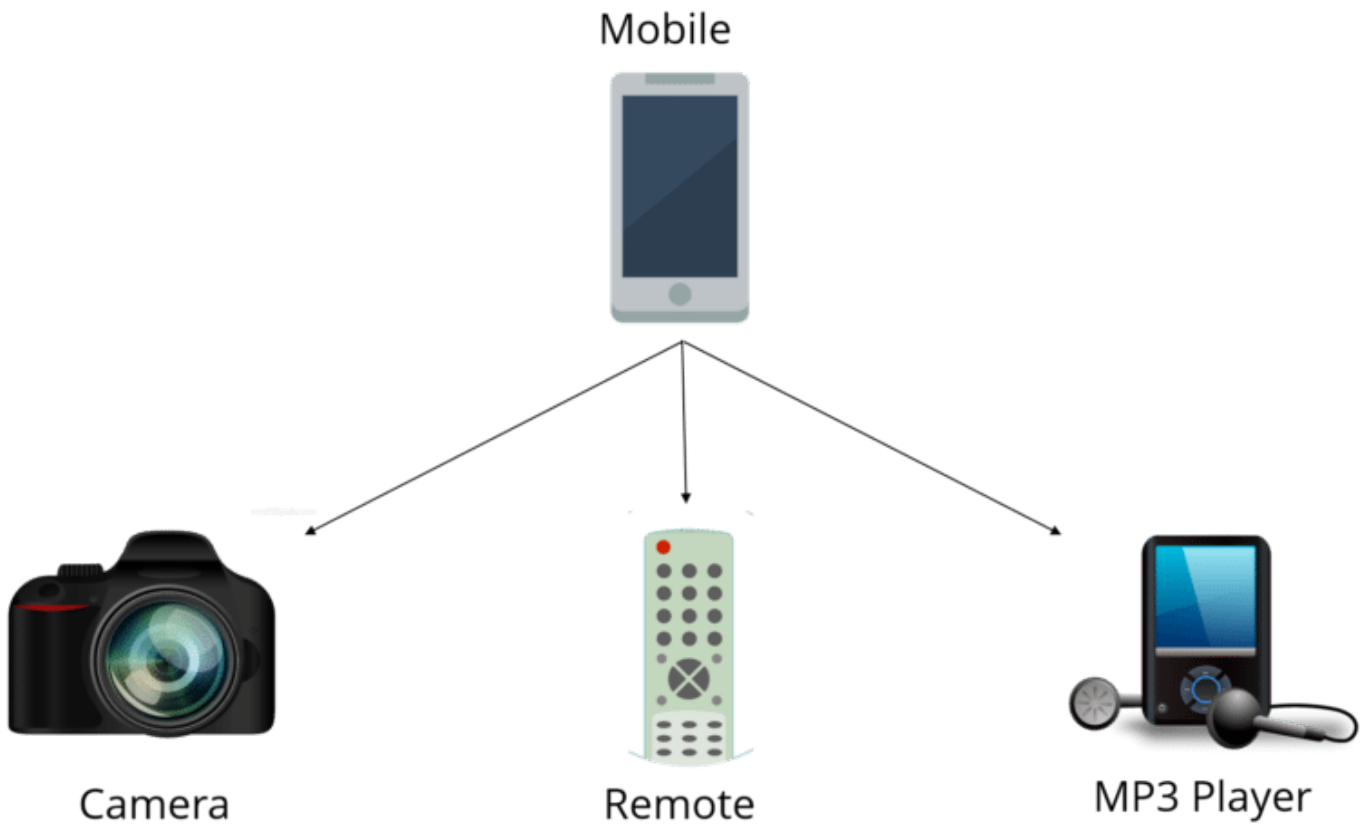
Q8 .What is the difference between a local variable and an instance variable?

In Java, a **local variable** is typically used inside a method, constructor, or a **block** and has only local scope. Thus, this variable can be used only within the scope of a block. The best benefit of having a local variable is that other methods in the class won’t be even aware of that variable.

Whereas, an **instance variable** in Java, is a variable which is bounded to its object itself. These variables are declared within a **class**, but outside a method. Every object of that class will create it's own copy of the variable while using it. Thus, any changes made to the variable won't reflect in any other instances of that class and will be bound to that particular instance only.

Q9 .What is Polymorphism?

Polymorphism is briefly described as "one interface, many implementations". Polymorphism is a characteristic of being able to assign a different meaning or usage to something in different contexts – specifically, to allow an entity such as a variable, a function, or an object to have more than one form. There are two types of polymorphism:



1. Compile time polymorphism
2. Run time polymorphism

Compile time polymorphism is method overloading whereas Runtime time polymorphism is done using inheritance and interface.

Q10 .What is an Association?

An Association can be defined as a relationship that has no ownership over another. For example, a person can be associated with multiple banks, and a bank can be related to various people, but no one can own the other.