Java is one of the most popular programming languages in the world, known for its versatility, portability, and wide range of applications. Java is the most used language in top companies such as Uber, Airbnb, Google, Netflix, Instagram, Spotify, Amazon, and many more because of its features and performance.

**1. Is Java Platform Independent if then how?**

Yes, Java is a Platform Independent language. Unlike many programming languages javac compiles the program to form a bytecode or .class file. This file is independent of the software or hardware running but needs a JVM(Java Virtual Machine) file preinstalled in the operating system for further execution of the bytecode.

**2. What are the top Java Features?**

Java is one the most famous and most used language in the real world, there are many features in Java that makes it better than any other language

* **Simple**: Java is quite simple to understand and the syntax
* **Platform Independent:** Java is platform independent means we can run the same program in any software and hardware and will get the same result.
* **Robust**: features like Garbage collection, exception handling, etc that make the language robust.
* **Object-Oriented**: Java is an object-oriented language that supports the concepts of class,  objects, four pillars of OOPS, etc.

### 3. What is JVM?

JVM also known as Java Virtual Machine is a part of JRE. JVM is a type of interpreter responsible for converting bytecode into machine-readable code.

**4. What is JIT?**

JIT stands for (Just-in-Time) compiler is a part of JRE(Java Runtime Environment), it is used for better performance of the Java applications during run-time.

**7. Difference between JVM, JRE, and JDK.**

**JVM**: JVM also known as Java Virtual Machine is a part of JRE. JVM is a type of interpreter responsible for converting bytecode into machine-readable code.

**JRE**: JRE stands for Java Runtime Environment, it is an installation package that provides an environment to run the Java program

**JDK**: JDK stands for Java Development Kit which provides the environment to develop and execute Java programs. JDK is a package that includes two things Development Tools to provide an environment to develop your Java programs and, JRE to execute Java programs or applications.

**8. What are the differences between Java and C++?**

| **Basis** | **C++** | **Java** |
| --- | --- | --- |
| **Platform** | C++ is Platform Dependent | Java is Platform Independent |
| **Application** | C++ is mainly used for System Programming | Java is Mainly used for Application Programming |

**9. Explain public static void main(String args[]) in Java.**

**Public**It is responsible for making the main function globally available. It is made public so that JVM can invoke it from outside the class

**static**: static is a keyword used so that we can use the element without initialising the class.

**Void** : keyword is used so that the main method doesn’t return anything.

**main**: main represents that the function declared is the main function. It helps JVM to identify that the declared function is the main function.

**String args[]**: It stores Java command-line arguments and is an array of type java.lang.String class

**10. What will happen if we declare don’t declare the main as static?**

We can declare the main method without using static and without getting any errors. But, the main method will not be treated as the entry point to the application or the program.

**11. What are packages in Java?**

Packages in Java are used to organize related classes and avoid name conflicts. They act like folders to group classes together, making code easier to manage and maintain.

**12. Explain different data types in Java.**

There are 2 types of data types in Java as mentioned below:

1. Primitive Data Type
2. Non-Primitive Data Type or Object Data type

**Primitive Data Type:** Primitive data are single values with no special capabilities. There are 8 primitive data types:

* **boolean**: stores value true or false
* **byte**: stores an 8-bit signed two’s complement integer
* **char**: stores a single 16-bit Unicode character
* **short**: stores a 16-bit signed two’s complement integer
* **int**: stores a 32-bit signed two’s complement integer
* **long**: stores a 64-bit two’s complement integer
* **float**: stores a single-precision 32-bit IEEE 754 floating-point
* **double**: stores a double-precision 64-bit IEEE 754 floating-point

**Non-Primitive Data Type:** Reference Data types will contain a memory address of the variable’s values because it is not able to directly store the values in the memory. Types of Non-Primitive are mentioned below:

* Strings
* Array
* Class
* Object
* Interface

### 13. Can we declare Pointer in Java?

No, Java doesn’t provide the support of Pointer. As Java needed to be more secure because which feature of the pointer is not provided in Java.

### 14.  What is the Wrapper class in Java?

Wrapper classes in Java are used to convert primitive data types (like int, char) into objects. For example, int can be wrapped into an Integer object. we need them for the following reasons:

1. Provides methods like valueOf(), parseInt(), etc.
2. It provides the feature of autoboxing and unboxing.

**15. Differentiate between instance and local variables.**

| **Instance Variable** | **Local Variable** |
| --- | --- |
| Declared outside the method, directly invoked by the method. | Declared within the method. |
| Has a default value. | No default value |
| It can be used throughout the class. | The scope is limited to the method. |

### 16. What is a Class Variable?

### In Java, a class variable (also known as a static variable) is a variable that is declared within a class but outside of any method, constructor, or block. Class variables are declared with the static keyword, and they are shared by all instances (objects) of the class

class A{

static int CHAR = 200;

public static void main(String args[])

{

System.out.println(CHAR);

}

}

**17. Difference in the use of print, println, and printf.**

print, println, and printf all are used for printing the elements but print prints all the elements and the cursor remains in the same line. println shifts the cursor to next line. And with printf we can use format identifiers too.

**18. What are operators?**

Operators are the special types of symbols used for performing some operations over variables and values.

**Types of operators in Java**:

1. **Arithmetic operators**: For math operations (e.g., +, -, \*, /).
2. **Relational operators**: For comparisons (e.g., ==, >, <).
3. **Logical operators**: For logical conditions (e.g., &&, ||, !).
4. **Assignment operators**: To assign values (e.g., =, +=).
5. **Unary operators**: For single operand operations (e.g., ++, --).
6. **Bitwise operators**: For operations on bits (e.g., &, |, ^)

**19. What is an array in Java?**

Array is a linear data structure which is used to store the mulptiple item together in onepalce and this item are of same type . In array elements are stroed in a contiguous memory . Array elements are accessed through indexing .

Advatage of array :=>

1> Randome access

2> Cache freidliness

Types of Array:

1> Fixed sized array = the are the array which dont allow the eleemnts more than the defined sized

ex =

int arr[] = {10, 15, 30};

int[] arr = new int[100];

int[] arr = new int[n];

2> Dynamic Sized Array = these are the array which can resize themeselves internally based upon the user implemenentation.

ex =

import java.util.\*;

class A

{

public static void main(String[] args)

{

ArrayList<Integer> al = new ArrayList<Integer>();

al.add(10);

al.add(20);

System.out.println(al);

}

}

**20. Why does the Java array index start with 0?**

Array indexing starts at zero because it's simpler for the computer to find the first item in memory. The first item is stored at the beginning, so starting at zero makes it easier to calculate its location.

**21. What do you understand by the jagged array?**

A jagged Array in Java is just a two-dimensional array in which each row of the array can have a different length. Since all the rows in a 2-d Array have the same length but a jagged array allows more flexibility i

n the size of each row.

**22. What are the advantages and disadvantages of an array?**

**Advantages of Arrays:**

1. **Fast Access:** Easy to access elements using index.
2. **Fixed Size:** Memory is allocated in a single block.
3. **Efficient for Similar Data:** Good for storing data of the same type.

**Disadvantages of Arrays:**

1. **Fixed Size:** Can't change size after creation.
2. **Inefficient Insertion/Deletion:** Adding or removing elements is slow, as it may require shifting.
3. **Wastes Memory:** If not all elements are used, memory is wasted.

### 23. What are Classes in Java?

In Java, Classes are the collection of objects sharing similar characteristics and attributes. Classes represent the blueprint or template from which objects are created.  Classes are not real-world entities but help us to create objects which are real-world entities.

**24. What is the difference between static (class) method and instance method?**

 **Static Method**:

* Belongs to the **class**.
* Called using the **class name**.
* No need to create an object.
* Can only access **static** variables/methods.

 **Instance Method**:

* Belongs to the **object**.
* Called using an **object**.
* Requires an object to be created.
* Can access **both static and instance** variables/methods.

**25. What is this keyword in Java?**

‘this’ is a keyword used to reference a variable that refers to the current object.

**27. What are Brief Access Specifiers and Types of Access Specifiers?**

Access Specifiers in Java help to restrict the scope of a class, constructor, variable, method, or data member. There are four types of Access Specifiers in Java mentioned below:

1. Public
2. Private
3. Protected
4. Default

**28. What is an object?**

The object is a real-life entity that has certain properties and methods associated with it. The object is also defined as the instance of a class. An object can be declared using a new keyword.

**29. What is the constructor?**

Constructor is a special method that is used to initialize objects. Constructor is called when a object is created. The name of constructor is same as of the class.

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