1. What is jvm?

JVM (Java Virtual Machine) is an abstract machine that enables your computer to run a Java program.When you run the Java program, Java compiler first compiles your Java code to bytecode. Then, the JVM translates bytecode into native machine code (set of instructions that a computer's CPU executes directly).Java is a platform-independent language. It's because when you write Java code, it's ultimately written for JVM but not your physical machine (computer). Since JVM executes the Java bytecode which is platform-independent, Java is platform-independent.

2. What is jdk?

JDK (Java Development Kit) is a software development kit required to develop applications in Java. When you download JDK, JRE is also downloaded with it.In addition to JRE, JDK also contains a number of development tools (compilers, JavaDoc, Java Debugger, etc).

3. What is jre?

JRE (Java Runtime Environment) is a software package that provides Java class libraries, Java Virtual Machine (JVM), and other components that are required to run Java applications. If you need to run Java programs, but not develop them, JRE is what you need.

4.What is Exception?

An exception is an unexpected event that occurs during program execution. It affects the flow of the program instructions which can cause the program to terminate abnormally.

Exceptions can be caught and handled by the program.When an exception occurs within a method, it creates an object. This object is called the exception object.It contains information about the exception such as the

name and description of the exception and state of the program when the exception occurred.

5.What is an error?

Errors represent irrecoverable conditions such as Java virtual machine (JVM) running out of memory, memory leaks, stack overflow errors, library incompatibility, infinite recursion, etc.
Errors are usually beyond the control of the programmer and we should not try to handle errors.

6.What is RunTime Exception?

A **runtime exception** happens due to a programming error. They are also known as **unchecked exceptions**.
These exceptions are not checked at compile-time but run-time. Some of the common runtime exceptions are:

- Improper use of an API - `IllegalArgumentException`
- Null pointer access (missing the initialization of a variable) - `NullPointerException`
- Out-of-bounds array access - `ArrayIndexOutOfBoundsException`
- Dividing a number by 0 - `ArithmeticException`

You can think about it in this way. “If it is a runtime exception, it is your fault”.The `NullPointerException` would not have occurred if you had checked whether the variable was initialized or not before using it.An `ArrayIndexOutOfBoundsException` would not have occurred if you tested the array index against the array bounds.

7.What is an IO Exception?

An IOException is also known as a **checked exception**. They are checked by the compiler at the compile-time and the programmer is prompted to handle these exceptions.

Some of the examples of checked exceptions are:

- Trying to open a file that doesn't exist results in FileNotFoundException
- Trying to read past the end of a file

8.Explain Throw and Throws keyword?

The Java throw keyword is used to explicitly throw a single exception.

When we throw an exception, the flow of the program moves from the try block to the catch block.

Similarly, the throws keyword is used to declare the type of exceptions that might occur within the method. It is used in the method declaration.

9.What is JAVA ASSERTION?

Assertions in Java help to detect bugs by testing code we assume to be true.

An assertion is made using the assert keyword. When assertions are enabled and the condition is true, the program executes normally.

But if the condition evaluates to false while assertions are enabled, JVM throws an AssertionError, and the program stops immediately.

10.What is advantage of assertion?

Advantages of Assertion

1. Quick and efficient for detecting and correcting bugs.

2. Assertion checks are done only during development and testing. They are automatically removed in the production code at runtime so that it won't slow the execution of the program.
3. It helps remove boilerplate code and make code more readable.
4. Refactors and optimizes code with increased confidence that it functions correctly.

11.When to use assertion?

Unreachable codes

Unreachable codes are codes that do not execute when we try to run the program. Use assertions to make sure unreachable codes are actually unreachable.

12.Compare between == and .equals()?

In Java, string equals() method compares the two given strings based on the data/content of the string. If all the contents of both the strings are same then it returns true. If all characters are not matched then it returns false.

We can use == operators for reference comparison

13.Difference between BFS DFS?

BFS stands for **Breadth First Search** is a vertex based technique for finding a shortest path in graph. It uses a Queue data structure which follows first in first out. In BFS, one vertex is selected at a time when it is visited and marked then its adjacent are visited and stored in the queue. It is slower than DFS.

DFS stands for **Depth First Search** is a edge based technique. It uses the Stack data structure, performs two stages, first visited vertices are pushed into stack and second if there is no vertices then visited vertices are popped.

14.Difference between Black box and White Box testing?

Black Box Testing	White Box Testing
It is a way of software testing in which the internal structure or the program or the code is hidden and nothing is known about it.	It is a way of testing the software in which the tester has knowledge about the internal structure or the code or the program of the software.
It is mostly done by software testers.	It is mostly done by software developers.
No knowledge of implementation is needed.	Knowledge of implementation is required.
It can be referred as outer or external software testing.	It is the inner or the internal software testing.
It is functional test of the software.	It is structural test of the software.
This testing can be initiated on the basis of requirement specifications document.	This type of testing of software is started after detail design document.
No knowledge of programming is required.	It is mandatory to have knowledge of programming.
It is the behavior testing of the software.	It is the logic testing of the software.
It is applicable to the higher levels of testing of software.	It is generally applicable to the lower levels of software testing.
It is also called closed testing.	It is also called as clear box testing.
It is least time consuming.	It is most time consuming.
It is not suitable or preferred for algorithm testing.	It is suitable for algorithm testing.
Can be done by trial and error ways and methods.	Data domains along with inner or internal boundaries can be better tested.
Example: search something on google by using keywords	**Example:** by input to check and verify loops

15.Difference between TCP AND UDP?

Transmission control protocol (TCP)	User datagram protocol (UDP)
TCP is a connection-oriented protocol. Connection-orientation means that the communicating devices should establish a connection before transmitting data and should close the connection after transmitting the data.	UDP is the Datagram oriented protocol. This is because there is no overhead for opening a connection, maintaining a connection, and terminating a connection. UDP is efficient for broadcast and multicast type of network transmission.
TCP is reliable as it guarantees delivery of data to the destination router.	The delivery of data to the destination cannot be guaranteed in UDP.
TCP provides extensive error checking mechanisms. It is because it provides flow control and acknowledgment of data.	UDP has only the basic error checking mechanism using checksums.
Sequencing of data is a feature of Transmission Control Protocol (TCP). this means that packets arrive in-order at the receiver.	There is no sequencing of data in UDP. If ordering is required, it has to be managed by the application layer.
TCP is comparatively slower than UDP.	UDP is faster, simpler and more efficient than TCP.
Retransmission of lost packets is possible in TCP, but not in UDP.	There is no retransmission of lost packets in User Datagram Protocol (UDP).
TCP has a (20-80) bytes variable length header.	UDP has a 8 bytes fixed length header.
TCP is heavy-weight.	UDP is lightweight.
TCP doesn’t supports Broadcasting.	UDP supports Broadcasting.

16. What is Functional Interface?

If a Java interface contains one and only one abstract method then it is termed as functional interface. This only one method specifies the intended purpose of the interface.

For example, the `Runnable` interface from package `java.lang`; is a functional interface because it constitutes only one method i.e. `run()`.
Here, we have used the annotation `@FunctionalInterface`. The annotation forces the Java compiler to indicate that the interface is a functional interface. Hence, does not allow to have more than one abstract method. However, it is not compulsory though.

17. What is Generics?

The Java Generics allows us to create a single class, interface, and method that can be used with different types of data (objects).

This helps us to reuse our code.

> **Note**: **Generics** does not work with primitive types (`int`, `float`, `char`, etc).

18. What is collection framework in java?

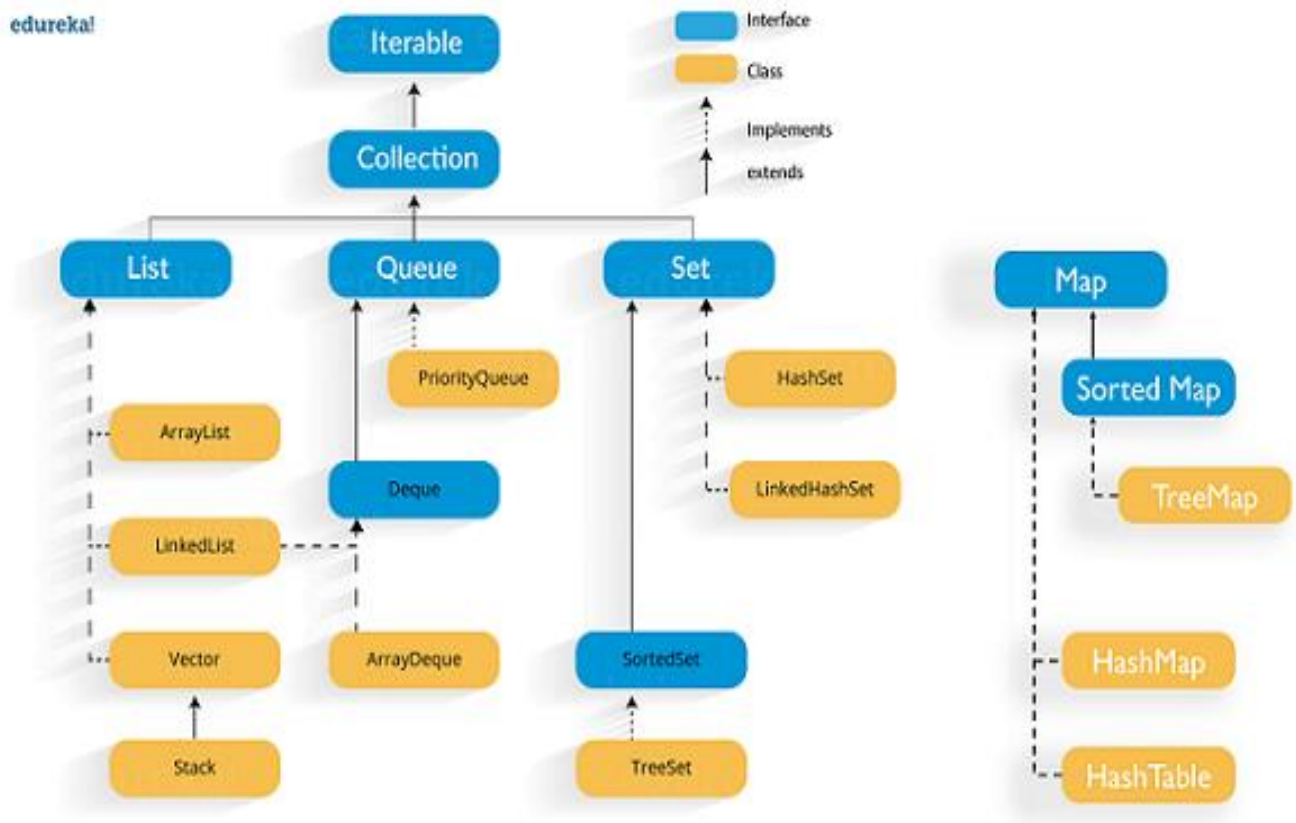
The Java Collection framework provides an architecture to store and manage a group of objects. It permits the developers to access prepackaged data structures as well as algorithms to manipulate data. The collection framework includes the following:

- Interfaces
- Classes

19.What are advantages of collection framework in java ?

Performance	The collection framework provides highly effective and efficient data structures that result in enhancing the speed and accuracy of a program.
Maintainability	The code developed with the collection framework is easy to maintain as it supports data consistency and interoperability within the implementation.
Reusability	The classes in Collection Framework can effortlessly mix with other types which results in increasing the code reusability.
Extensibility	The Collection Framework in Java allows the developers to customize the primitive collection types as per their requirements.

20.Draw collection hierarchy in java ?



21.List the primary interfaces in java?

Collection

List

Set

Queue

22.Advantages of generic collection?

- Provides stronger type checks at the time of compilation
- Eliminates the need for typecasting
- Enables the implementation of generic algorithms which makes the code customizable, type-safe and easier to read

23.What are benefits of using Properties File?

The main advantage of using the properties file in Java is that in case the values in the properties file is changed it will be automatically reflected without having to recompile the java class. Thus it is mainly used to store information which is liable to change such as username and passwords. This makes the management of the application easy and efficient.

24. What is the need for overriding equals() method in Java?

The initial implementation of the equals method helps in checking whether two objects are the same or not. But in case you want to compare the objects based on the property you will have to override this method.

25. How would you convert an ArrayList to Array and an Array to ArrayList?

An Array can be converted into an ArrayList by making use of the asList() method provided by the Array class. It is a static method that accepts List objects as a parameter.

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