**Interview Questions :-**

1.What is method overloading?

Method overloading means to perfor operation within class with same method name with difference parameter at run called as method overloading .

 Improves **code readability**.

 Provides **flexibility** to call the same method with different arguments.

**Example of method overloading :-**

class Calculator {

// Method with 2 int parameters

int add(int a, int b) {

return a + b;

}

// Method with 3 int parameters

int add(int a, int b, int c) {

return a + b + c;

}

// Method with 2 double parameters

double add(double a, double b) {

return a + b;

}

}

public class Main {

public static void main(String[] args) {

Calculator c = new Calculator();

System.out.println(c.add(2, 3)); // calls int add(int, int)

System.out.println(c.add(2, 3, 4)); // calls int add(int, int, int)

System.out.println(c.add(2.5, 3.5)); // calls double add(double, double)

}

}

2.How do you handle divide-by-zero?

You handle it using a **conditional check** or **try-catch block**:

// method 1

if (b != 0) {

int result = a / b;

} else {

System.out.println("Cannot divide by zero");

}

// method 2

try {

int result = a / b;

} catch (ArithmeticException e) {

System.out.println("Error: " + e.getmessage());

}

3.Difference between == and .equals()?

== compares **object references** (memory addresses).

.equals() compares **object values** (content), usually overridden in classes like String.

Class ABC{

Public static void main(String arg[])

{

String a = new String("hello");

String b = new String("hello");

System.out.println(a == b); // false (different objects)

System.out.println(a.equals(b)); // true (same content)

}

4.What are the basic data types in Java?

**1) int:**  
This data type is used to store integer (whole number) values. It typically takes **4 bytes** of memory and can store values from approximately **-2,147,483,648 to 2,147,483,647**.

**2) float:**  
This data type is used to store decimal (floating-point) numbers. It takes **4 bytes** of memory and provides up to **6 to 7 digits of precision**.

**3) char:**  
This data type is used to store a **single character**, such as 'A' or '9'. It takes **2 bytes** in Java (because it uses Unicode encoding).

**4) long:**  
This data type is used to store **larger integer values** than int. It takes **8 bytes** of memory and can store values from approximately **-9 quintillion to +9 quintillion**.

**5) double:**  
This data type is used to store **double-precision decimal numbers**. It takes **8 bytes** and provides up to **15 to 16 digits of precision**, making it more accurate than float.

6) **byte**

Stores very small integers: range from **-128 to 127**

Size: **1 byte**

Useful for saving memory in large arrays.

7) **short**

Stores small integers: range from **-32,768 to 32,767** and Size: **2 bytes**

**8)boolean**

Stores **true** or **false** values only and Size: **1 bit** (though JVM uses 1 byte internally)

5.How is Scanner used for input?

In java the Scanner class is use to take input from the user through when we want to use Scanner in our program we need to add package import java.util.Scanner; or import java.util.\*;Scanner present in this package and create scanner reference foruse to take input .

Ex:-

Import java.util.Scanner ;

Class ABC{

Public static void main(String arg[])

{

Scanner sc=new Scanner (System.in);

Int a=sc.nextInt();//

String str=sc.nextLine();

}

}

**sc**: This is a **reference variable** of the Scanner class. It refers to the Scanner object created to read input.

6.Explain the role of a loop.

A **loop** in programming is used to **repeat a block of code** multiple times — either **a fixed number of times** or **until a certain condition is met**.

 **Avoids code repetition**  
Instead of writing the same code multiple times, you write it once and loop over it.

 **Automates repetitive tasks**  
Example: printing numbers from 1 to 100.

 **Saves time and memory**  
Less code means better readability and lower chance of errors.

 **Used for processing collections**  
You can loop through arrays, lists, database records, etc.

7.Difference between while and for loop?

For Loop:-

Initialization, condition, and increment in one line

When number of iterations is **known**

Done in the loop itself

More compact, easier to read for fixed loops

for (int i = 1; i <= 5; i++) {

System.out.println(i);

}

While Loop:-

Only condition is part of the loop header

When number of iterations is **unknown**

Done **before** the loop and Done **inside** the loop body

More flexible for complex conditions

int i = 1;

while (i <= 5)

{

System.out.println(i);

i++;

}

8.What is the JVM?

JVM is machine in java with the help of jvm we can conver byte code into machine understandable code . JVM stand for Java Virtual Machine

Java Source Code (.java)

↓

Java Compiler (javac)

↓

Bytecode (.class)

↓

JVM (Java Virtual Machine)

↓

Machine Code (executed on hardware)

9.How is Java platform-independent?

because **Java code can run on any operating system (Windows, Linux, macOS, etc.)** without changing the source code.this is possible fror (JVM )

10.How do you debug a Java program?

Debugging is the process of **finding and fixing errors (bugs)** in a program so that it works as expected.

#### ****Using**** System.out.println() ****statements****

Add print statements to check variable values and flow of execution.

Example :-

int x = 10;

System.out.println("x = " + x);