Java Interview Questions

Java Basics & Features

Q: What is Java?
Q: What is Java and what are its main features?

Explain "Write Once, Run Anywhere" principle in Java.

Q: What are the advantages and disadvantages of Java?
Q: How is Java platform-independent?
Q: What is bytecode in Java?

Memory Management

Explain Java memory management and garbage collection.

Q: What is the difference between stack and heap memory?
Q: How does garbage collection work in Java?
Q: What are memory leaks in Java and how to prevent them?

Explain different types of references in Java (Strong, Weak, Soft, Phantom).

Default Values & Variables

Q: What are the default values assigned to variables in Java?
Q: What happens if you don't initialize a local variable?
Q: What are the different types of variables in Java?

Explain the difference between instance and static variables.

Q: What is the scope of variables in Java?

Public Static Void Main

Explain each keyword in public static void main(String[] args).

Q: Why is the main method static in Java?
Q: Can we have multiple main methods in a Java class?
Q: Can we overload the main method?
Q: What happens if we remove 'static' from the main method?

Packages & Access Modifiers

Packages

Q: What are packages in Java and why are they used?
Q: How many built-in packages does Java have?
Q: What is the difference between import and static import?
Q: Can a class belong to multiple packages?
Q: What is the naming convention for packages?

Wrapper Classes

Q: What are wrapper classes in Java?
Q: What is autoboxing and unboxing?
Q: When should you use wrapper classes vs primitives?
Q: What is the difference between == and .equals() with wrapper classes?

Explain the Integer cache in Java.

Default Values & Variable Assignment

Q: What are default values for different data types?
Q: Can you change the default values of instance variables?
Q: What is the difference between declaration and initialization?

Explain variable shadowing in Java.

Q: What happens when you access an uninitialized variable?

System.out vs System.err

Q: What is the difference between System.out and System.err?
Q: Can you redirect System.out and System.err?
Q: What is System.in used for?

Explain the PrintStream class.

Q: How do you format output using System.out.printf()?

Classes & Objects

Q: What is the difference between a class and an object?
Q: How many objects can be created from a single class?
Q: What is a constructor and its types?
Q: Can a class exist without a constructor?

Q: What is the difference between default and parameterized constructors?

Object-Oriented Programming

Explain OOPs Concepts

Q: What are the four pillars of Object-Oriented Programming?

Explain encapsulation with an example.

Q: What is inheritance and its types?

Explain polymorphism and its types.

Q: What is abstraction and how is it achieved?

Abstract Class vs Interface

Q: What is the difference between abstract class and interface?
Q: When would you use an abstract class vs an interface?
Q: Can an abstract class have constructors?

Can an interface have concrete methods? (Java 8+)

Q: What are default and static methods in interfaces?

String & StringBuffer

Q: What is the difference between String, StringBuffer, and StringBuilder?
Q: Why are Strings immutable in Java?
Q: What is the String pool?
Q: When should you use StringBuilder over String concatenation?

Explain the intern() method in String class.

Collections Framework

Java Collections

Q: What is the Collection Framework in Java?
Q: What are the main interfaces in the Collection Framework?

Explain the hierarchy of Collection classes.

Q: What is the difference between Collection and Collections?

Q: When to use ArrayList vs LinkedList vs Vector?

List, Set, Map

Q: What is the difference between List, Set, and Map?

Explain HashMap vs HashTable vs ConcurrentHashMap.

Q: What is the difference between HashSet and TreeSet?
Q: How does HashMap work internally?
Q: What is the load factor in HashMap?

Coding & Pattern Problems

Basic Programming

Write a program to check if a number is prime.

Write a program to find factorial of a number.

Write a program to generate Fibonacci series.

Write a program to reverse a string.

Write a program to check if a string is palindrome.

Pattern Printing

Write a program to print a pyramid pattern.

Write a program to print diamond pattern.

Write a program to print number patterns.

Write a program to print Floyd's triangle.

Write a program to print Pascal's triangle.

Advanced Java Concepts

Exception Handling

Q: What is exception handling in Java?
Q: What is the difference between checked and unchecked exceptions?

Explain try-catch-finally blocks.

Q: What is the difference between throw and throws?
Q: Can you have multiple catch blocks for a single try?

Multithreading

Q: What is multithreading in Java?
Q: What are the ways to create threads in Java?

Explain synchronization in Java.

Q: What is deadlock and how to prevent it?
Q: What is the difference between wait() and sleep() methods?

Java 8 Features

Q: What are lambda expressions?

Explain the Stream API in Java 8.

Q: What is the Optional class?
Q: What are method references?
Q: What are functional interfaces?

Practical Scenario Questions

Q: How would you design a simple library management system?

Explain how you would implement a parking lot system.

Q: How would you handle a situation where multiple threads access shared data?

Design a simple calculator using OOP principles.

Q: How would you optimize the performance of a Java application?

Bonus Questions for Depth

Explain JVM architecture.

Q: What is reflection in Java?
Q: What are annotations and how are they used?

Explain the Singleton design pattern.

Q: What is dependency injection?