

# Object Oriented Programming in Java

## Interview Questions

- Q1) (a) What are the differences between procedural programming and object oriented programming languages?
- (b) What are the drawbacks of procedural programming language?
- (c) What are the needs/advantages of object oriented programming language?

## Procedural Programming

- Focuses on functions & logic!
- less reliable & secure
  - ↳ No access modifiers
- less reusability & difficulty in maintaining the codebase
- Example: → C Programming language

Note: → Javascript is functional programming language.

## Object oriented Programming

- Focuses on data & objects!
    - ↳ Data members & member functions
  - more reliable & secure
    - ↳ Data hiding & Encapsulation
  - more reusability & easy maintainability
    - ↳ Due to Inheritance & Polymorphism
  - Example: → C++, Java, Python, C#
- higher order functions

# Need of Object Oriented Programming

## PILLARS OF OOPS

**Encapsulation**

- classes & objects
- Getters & Setters
- Constructors (types & chaining)
- this, static, final keyword

**Inheritance**

- Types of Inheritance
- ISA (Inheritance) vs hasA (composition)
- Super keyword
- Multiple Inheritance (Diamond Problem)

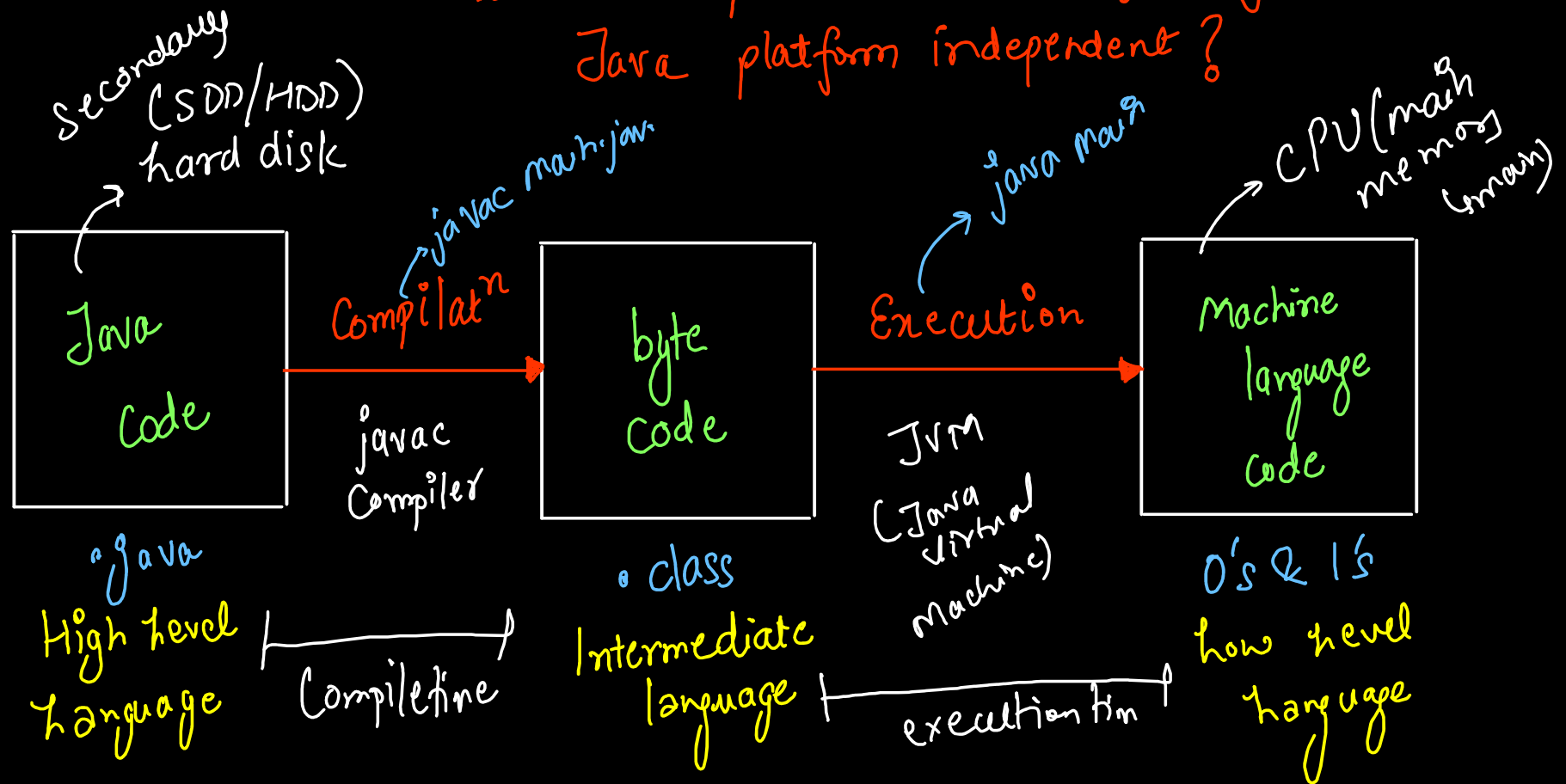
**Polymorphism**

- Compile Time or Static or method overloading
- Runtime or Dynamic or method overriding

**Abstraction & Data Hiding**

- Packages
- Access Specifier
- Abstract classes
- Interfaces

~~Q~~ Q) Explain Software Development Process in Java. What are various components in Java? Why is Java platform independent?



# # Java Architecture

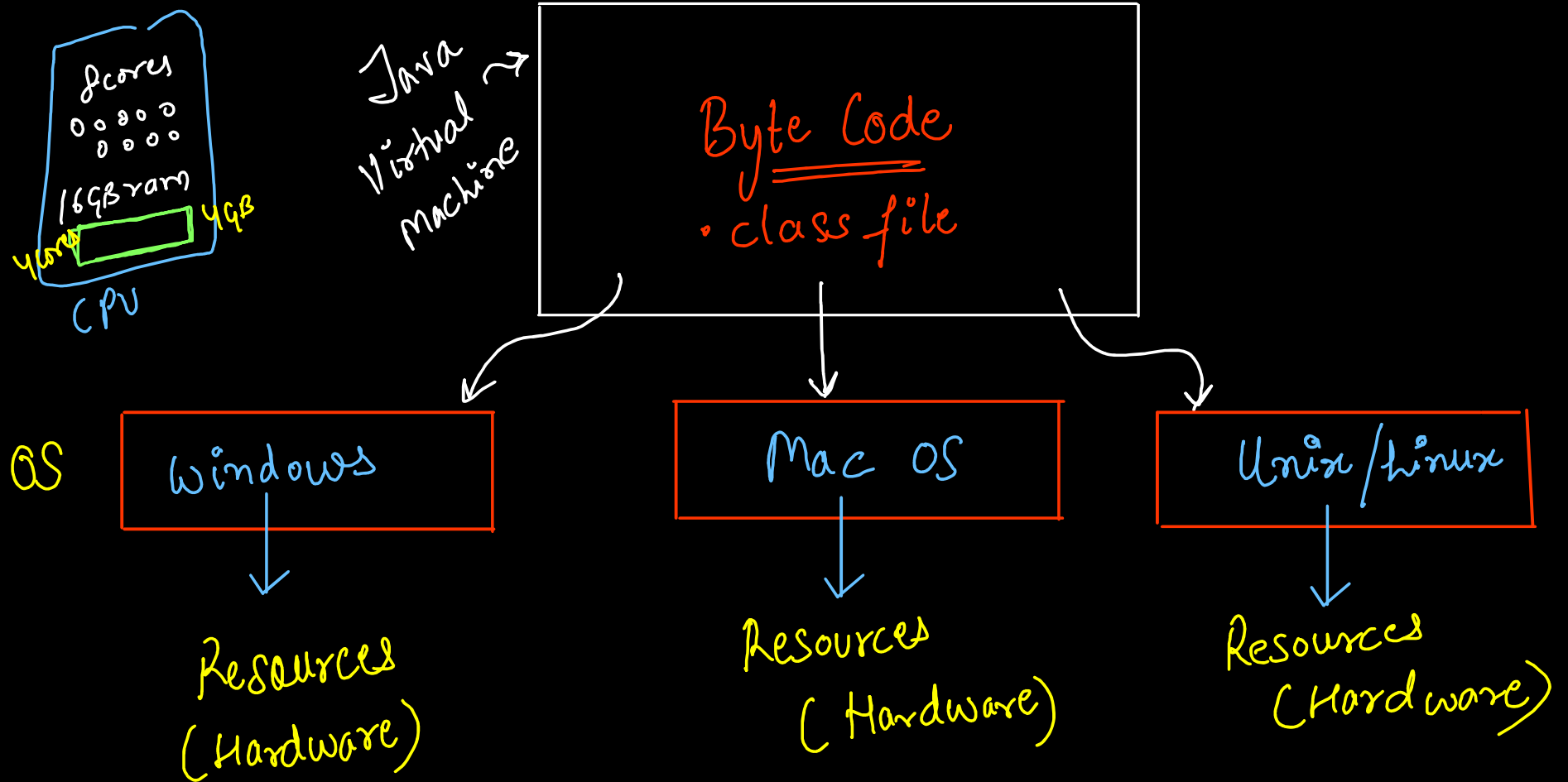
Oracle

Java Development Kit (JDK) = JRE + Development Tools  
{ Interpreter, Class loader, compiler (javac) }  
linker,

Java Runtime Environment (JRE)  
= JVM + library classes

Java Virtual Machine (JVM)

# # Java Is Platform Independent



# Games  
# desktop apps

C++

2 faster

Java

• cpp source code

compiler

machine  
dependent

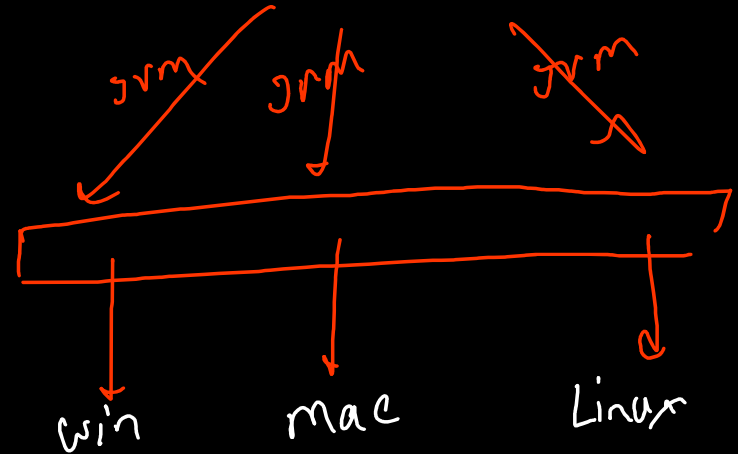
• exe executable file

faster  
run on operating syst

java source code

↓

• class byte code



Q) What are differences between Program & Process? What do you mean by process memory layout? Explain the steps in process creation/program execution?

(secondary storage)  
Hard disk  
↑

## # Program vs Process

# Program → Code/Set of Instructions (• Java)

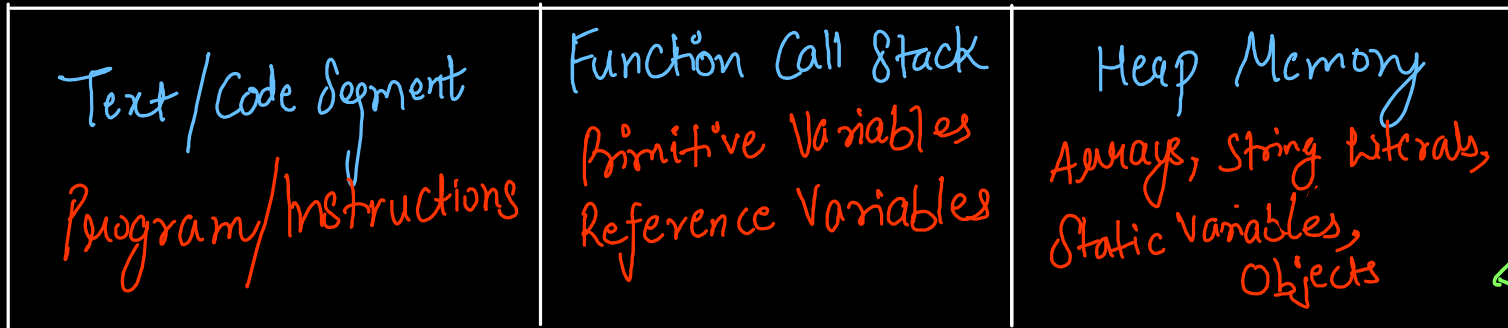
# Program under execution is known as process

# Process = Program (Code) + Stack & Heap memory  
+ Other resources  
(CPU, disk, Network, I/O file, etc)



RAM

## # Process Memory Layout (Random Access memory) main memory



↓  
function scope  
lifetime = fn  
↳ int, char, boolean, short, byte, long, float, double

↖ scope = program  
(global)  
↘ lifetime = program

Global / Static data  
Segment  
static data, global data  
Constants

# # Steps in Program Execution

JVM

