

Q Define object oriented programming (OOP). Describe four pillars of OOP.

Definition: Object oriented programming (OOP) is a programming approach where software is designed around objects. Each object has attributes (data) and methods/behaviors.

The four pillars of OOP -

i) Encapsulation: Wrapping data or variable and methods together inside a single unit.

ii) Abstraction: Showing only essential details and hiding the complex implementation.

iii) Inheritance: A mechanism where one class acquires the properties and methods of another class.

iv) Polymorphism: A ability of an object to behave in many forms.

Q Describe Compilation and Execution of Java programming with a diagram.

Answer:-

Here are the steps of compilation and Execution of Java program -

Steps:-

1. Writing code: ~~the~~ source code is written in .Java file.
2. compilation: Java compiler translates .Java into bytecode (.class file).
3. Class Loader: Loads class files into JVM memory.
4. Bytecode verifier: Checks security & correctness.
5. JVM Execution Engine: Interprets bytecode or uses JIT to convert into machine code.
6. program output: Runs on the operating system.

## Diagram:

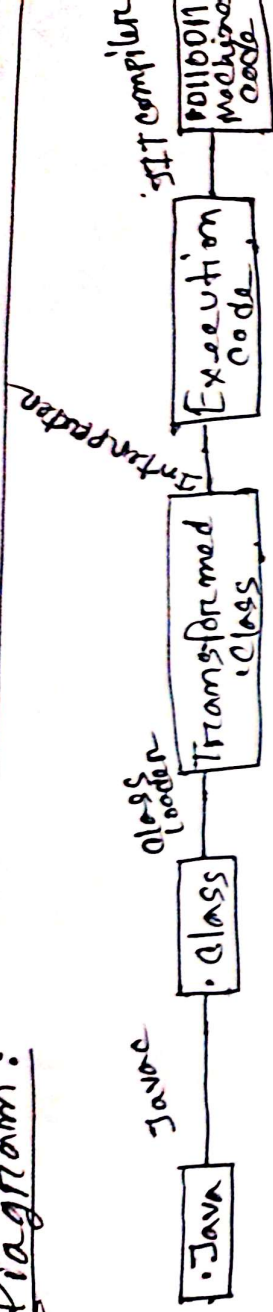


fig: compilation & Execution process.

Answer:-

Tracing the output including simulation of the following problem:-

Iteration	x before	Condition ( $x++ > y$ )	x (after ( $x++ > y$ ))	Branch Chosen	x (after assignment)
1	6	$6 > 3 \rightarrow$ true	7	$x - y$	4
2	4	$4 > 3 \rightarrow$ true	5	$x - y$	2
3	2	$2 > 3 \rightarrow$ false	3	$++y - i$	1

Simulation Table

Output:

run:-

4 3 1 2 3 1 1 4 1

final values:  $x=1, y=4$