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Assignment - 2

Problem Statement: Write a program in Java showing hierarchical inheritance with base class as Employee & derived classes as Full Time Employee & Intern Employee with methods Display Salary in base class & CalculateSalary in derived classes. Calculate salary method will calculate as per increment given to full time & intern employees. Full Time employee - 50 % hike, Intern Employee - 25% hike. Display salary before & after hike.

Objective:
1. To study Inheritance in Java.
2. To study why to use Inheritance.
3. To study types of Inheritance.

Theory:-

1. What is inheritance in Java.

Inheritance in java is a concept where one class acquires the properties & behaviors of another class.

use:
- code reusability
- reduces duplication
- runtime polymorphism.

2. Why to use inheritance?

-i) Code reusability
-ii) Reduces code duplication.
-iii) Easy maintenance
-iv) Supports method overriding.
-v) Better relationship. b/w classes.
-vi) Supports polymorphism

3 Types in inheritance.

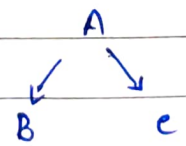
-i) Single inheritance :

A ⟶ B

-ii) Multi-level inheritance:

A ⟶ B ⟶ C

-iii) Hierarchical inheritance:



FAQs

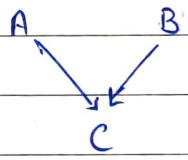
1. Is multiple inheritance supported in java? How is it achieved?

Soln: No, java does not support multiple inheritance through classes.

Multiple inheritance means a class inheriting properties & behavior from more than one parent class.

Java does not support this because it may create ambiguity known as the Diamond problem.

Multiple inheritance:



=> Java achieves multiple inheritance through interfaces, using implements keyword.

```
interface A {
    void function1();
}
interface B {
    void function2();
}

class C implements A, B {
    public void function1() { }
    public void function2() { // }
}
```

2. What is Is-A-Relationship in Java?

Soln: An Is-A- Relationship in java represents inheritance.

It shows that one class is a specialized form of another class.

It is achieved using extends keyword. or implements keyword.
- helps in code reusability
- helps polymorphism.

3. Are constructor & instance initialization block inherited to subclass?

Soln: No, constructors & instance initialization blocks are not inherited by a subclass in Java.

1. Constructor: belongs only to its own class. when a subclass object is created:
   - parent class constructor is executed first

2. Instance initialization: such blocks are also not inherited.
   - they execute whenever an object of that class is executed.

Conclusion: Thus, successfully implemented usage of inheritance in java.