Abstract Class & Abstract Method - Complete Notes

Abstract Class and Abstract Method

Abstract Class:

Definition:

A class which contains the 'abstract' keyword in its declaration is called an Abstract Class.

Important Points:

1. We can't create an object of an abstract class.
2. It may or may not contain abstract methods.
3. It can have both abstract and non-abstract methods.
4. To use an abstract class, you must inherit it from a subclass.
5. If a class contains partial implementation, we should declare it as abstract.

Example:

```
abstract class A { }
class B extends A { }
```

Abstract Method:

Definition:

A method which contains the 'abstract' modifier at the time of declaration is called an Abstract Method.

Important Points:

1. It can only be used in an abstract class.
2. It doesn't contain any body and always ends with a semicolon (;).
3. Abstract methods must be overridden in subclasses, otherwise the subclass also becomes abstract.
4. Whenever the action is common but implementation is different, we should use abstract methods.

Example:

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```
abstract class Fruits {
    abstract void taste();
}
abstract class Vehicle {
    abstract void wheels();
}
```

Practical Java Example:

```
abstract class Programming { // Superclass
    public abstract void Developer();
    public abstract void Rank();
}

class Html extends Programming {
    @Override
    public void Developer() {
        System.out.println("Tim Berners Lee");
    }
    @Override
    public void Rank() {
        System.out.println("1st");
    }
}

abstract class Java extends Programming { // Still abstract because Rank() is not overridden
    @Override
    public void Developer() {
        System.out.println("James Gosling");
    }
}
```

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```
class Main {
    public static void main(String[] args) {
        Programming ha = new Html();
        ha.Developer();
        ha.Rank();
    }
}
```

Explanation of Code:

- The Programming class is abstract and defines two abstract methods: Developer() and Rank().
- Html class overrides both methods, so it becomes a concrete class and can be instantiated.
- Java class overrides only Developer(), so it remains abstract.
- We use an object reference of type Programming to call overridden methods in Html.