Abstract Classes in Java

In C++, if a class has at least one pure virtual function, then the class becomes abstract. Unlike C++, in Java, a separate keyword *abstract* is used to make a class abstract.

```
// An example abstract class in Java
abstract class Shape {
    int color;

    // An abstract function (like a pure virtual function in C++)
    abstract void draw();
}
```

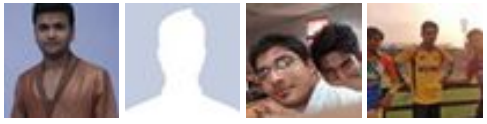
Following are some important observations about abstract classes in Java.

1) Like C++, in Java, an instance of an abstract class cannot be created, we can have references of abstract class type though.

```
abstract class Base {
    abstract void fun();
}
class Derived extends Base {
    void fun() { System.out.println("Derived fun() called"); }
}
class Main {
    public static void main(String args[]) {

        // Uncommenting the following line will cause compiler error a
        // line tries to create an instance of abstract class.
        // Base b = new Base();

        // We can have references of Base type.
        Base b = new Derived();
        b.fun();
```

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```
    }
}
```

Output:

```
Derived fun() called
```

2) Like C++, an abstract class can contain constructors in Java. And a constructor of abstract class is called when an instance of a inherited class is created. For example, the following is a valid Java program.

```
// An abstract class with constructor
abstract class Base {
    Base() { System.out.println("Base Constructor Called"); }
    abstract void fun();
}
class Derived extends Base {
    Derived() { System.out.println("Derived Constructor Called"); }
    void fun() { System.out.println("Derived fun() called"); }
}
class Main {
    public static void main(String args[]) {
        Derived d = new Derived();
    }
}
```

Output:

```
Base Constructor Called
Derived Constructor Called
```

3) In Java, we can have an abstract class without any abstract method. This allows us to create classes that cannot be instantiated, but can only be inherited.

```
// An abstract class without any abstract method
abstract class Base {
    void fun() { System.out.println("Base fun() called"); }
}

class Derived extends Base { }

class Main {
```

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```
    public static void main(String args[]) {
        Derived d = new Derived();
        d.fun();
    }
}
```

Output:

```
Base fun() called
```

4) Abstract classes can also have final methods (methods that cannot be overridden). For example, the following program compiles and runs fine.

```
// An abstract class with a final method
abstract class Base {
    final void fun() { System.out.println("Derived fun() called"); }
}

class Derived extends Base {}

class Main {
    public static void main(String args[]) {
       Base b = new Derived();
       b.fun();
    }
}
```

Output:

```
Derived fun() called
```

Exercise:

1. Is it possible to create abstract and final class in Java?

2. Is it possible to have an abstract method in a final class?

3. Is it possible to inherit from multiple abstract classes in Java?

Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above.

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Excersie:

1. No we cannot mark an abstract class as final
2. No we cant have a abstract method in final class as final class not be sub c
3. In java we can not have multiple inheritance due to the ambiguity problem th bodies

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yeah Ghazanfar Ali Bhayo you can make your abstract class to extend

```
class A
{
public int a;
}
abstract class AbsA extends A
{
void assign_a()
{
a=10;
}
}
class MainClass extends AbsA
{
psvm(String args[])
{
```

```
AbsA obj=new Mainclass();
obj.assign_a();
sysout(a);
}
}
```

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we need not write "abstract" keyword for abstract methods.plz correct me if I a

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Yes you are correct. To make any method abstract you have to mark c

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To specify a method as Abstract ,,, keyword is mandatory . take any ex

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we need not write "abstract" keyword for abstract methods.plz correct me if I a

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wgpshashank • a year ago

1. Is it possible to create abstract and final class in Java?
No,

When a class is declared final,it cannot be extended or subclassed.If any atte

compilation error .

An abstract class can never be instantiated.Its main mission is to be sub-class
abstract, the whole class must be declared abstract.However you can have n
class.You cannot create an object out of abstract classes,which will result in
compilation error, thus its duty of subclass to give definition of superclass's m
abstract, not following such result in complication error

So now if one declare the class both final and abstract then both will contradic
final an d abstract .

2. Is it possible to have an abstract method in a final class?

NO , since if you declare abstract method in class must be declared abstract
info please read above reasoning .

3. Is it possible to inherit from multiple abstract classes in Java?

No, Java Doesn't support multiple inheritance , but you can achieve this by imp

Feel free to comment !!!

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