

ABSTRACT CLASS

- No object of this class

```
abstract class Shape {
    private Color c;
    abstract public double getArea(); // ← derived direct class has to implement this function
}
```

JAVA

```
Shape s;
X s = new Shape(); // error
✓ s = new Triangle();
```

```
class Triangle extends Shape {
    public double getArea() {
    }
}
```

Abstract class	method	Can create object?
∅	∅	✓
∅	1	X
1	∅	X
1	1	X

C++

```
class Person {
    public:
        string name;
        ;
}
```

```
void Print (list<Person>& l) {
    typedef list<Person>::const_iterator CI;
    for (CI iterator = l.begin(); iterator != l.end(); iterator++) {
        Person p = *iterator;
        p.print();
    }
}
```

```
list<Person> pl;
pl.push_back(Person(20, "Alice"));
pl.push_back(Person(21, "Bob"));
print(pl);
Person p3(22, "Claire");
pl.push_back(p3);
p3.name = "Deb"; print(pl);
```

reference

new copy!!!

gives "Claire"