

## 1 Basic multiple inheritance issues

[http://www.adp-gmbh.ch/cpp/virt\\_base.html](http://www.adp-gmbh.ch/cpp/virt_base.html)

```
class B
{
    protected: int b_;
};

class D1 : public B { };
class D2 : public B { };

class D1v : public virtual B { };
class D2v : public virtual B { };

class D : public D1, public D2
{
    public: void f();
};

class Dvv : public virtual D1, public virtual D2
{
    public: void f();
};

class D_vv : public D1v, public D2v
{
    public: void f();
};

void D::f()
{
    // b_ = 4;
    // error C2385 D::b_ is ambiguous,
    // could be the 'b_' in base 'B' of base 'D1' of class 'D'
    // or the 'b_' in base 'B' of base 'D2' of class 'D'

    D1::b_ = 5; // Ok
    D2::b_ = 6; // Ok
}

void Dvv::f()
{
    // b_ = 4;
    // error C2385: 'Dvv::b_' is ambiguous
    // could be the 'b_' in base 'B' of base 'D1' of class 'Dvv'
    // or the 'b_' in base 'B' of base 'D2' of class 'Dvv'
```

```

D1::b_ = 7; // Ok
D2::b_ = 8; // Ok
}

```

Here is the implementation of `D_vv::f`. `D_vv` has two base classes: `D1v` and `D2v`, which both have `B` as a virtual base class. Therefore, `b_` is shared, and setting `b_` is equivalent to setting `D1v::b_` which is equivalent to setting `D2v::b_`.

```

void D_vv::f()
{
    b_=4; // Ok
    D1v::b_=5;
    D2v::b_=6;

    if (b_ != D1v::b_ ||
        b_ != D2v::b_ ||
        D1v::b_ != D2v::b_) {
throw "Should not be thrown";
    }
}

int main()
{
    D d;
    d.f();
    Dvv dvv;
    dvv.f();
    D_vv d_vv;
    d_vv.f();
    return 0;
}

```

## 2 Java interface vs. abstract class

<http://java.sun.com/docs/books/tutorial/java/interpack/interfaceDef.html>

- Interfaces cannot implement any methods. Can only declare methods and define constants.
- Classes can implement many interfaces. Unrelated classes can implement the same interface.
- Interfaces can have multiple super-interfaces. Can only have one superclass. Implementations of interface methods must have the same signature as the declaration.
- Interfaces can be used as types. From the URL above:

```

public class StockMonitor {
    public void watchStock(StockWatcher watcher,
                          String tickerSymbol, double delta) {
        ...
    }
}

```