Multiple Inheritance Cases
Ambiguities and Solutions

CS 617 Object Oriented Systems
Lecture 11
Multiple Inheritance
3:30-5:00 pm, Mon Feb 11

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Outline

1. Multiple Inheritance Cases
2. Ambiguities and Solutions
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1. Multiple Inheritance Cases

2. Ambiguities and Solutions
class Input {
public:
    virtual void in(int)=0;
};

class Output {
public:
    virtual int out()=0;
};

class UnsecuredIO : public Input, public Output {
int buff;
    void in(int val) { buff=val;}
    int out() { return buff;}
};
int main () {
    UnsecuredIO *u = new UnsecuredIO();
    Input *in = u;
    Output *out = u;
    in→in(25);
    int x = out→out();
    cout << x;
}
class Input {
    int buff;
    public:
        void in(int val) { buff=val;}
    }

class Output {
    int buff;
    public:
        int out() { return buff;}
    }

class UnsecuredIO : public Input, public Output { };
int main () {
    UnsecuredIO *u = new UnsecuredIO();
    Input *in = u;
    Output *out = u;
    in->in(25);
    int x = out->out();
    cout << x;
}

class Channel {
protected:
    int buff;
};

class Input: public Channel {
public:
    virtual void in(int val) { buff=val;}
};

class Output: public Channel {
public:
    virtual int out() { return buff;}
};

class UnsecuredIO : public Input, public Output { };
int main () {
    UnsecuredIO *u = new UnsecuredIO();
    Input *in = u;
    Output *out = u;
    in->in(25);
    int x = out->out();
    cout << x;
}
How many copies of "buff" in instance of most derived class? I

- one?
- two?
Repeated or Shared?

```
Class a
  f()
  g()

Class b
  f()
  k()

Class c
  f()
  l()

??
```
Solving Ambiguities

Member Functions

Attributes

choice of repeated vs. shared
Another Solution

Diagram:

```
  a
    f()    a
    g()   ×

  b
    f()   f() = 0
    k()   g() = 0

  c
    f() = 0
    l() = 0

??
```