CASTING AND MEMBER VARIABLES

Locating variables inside objects
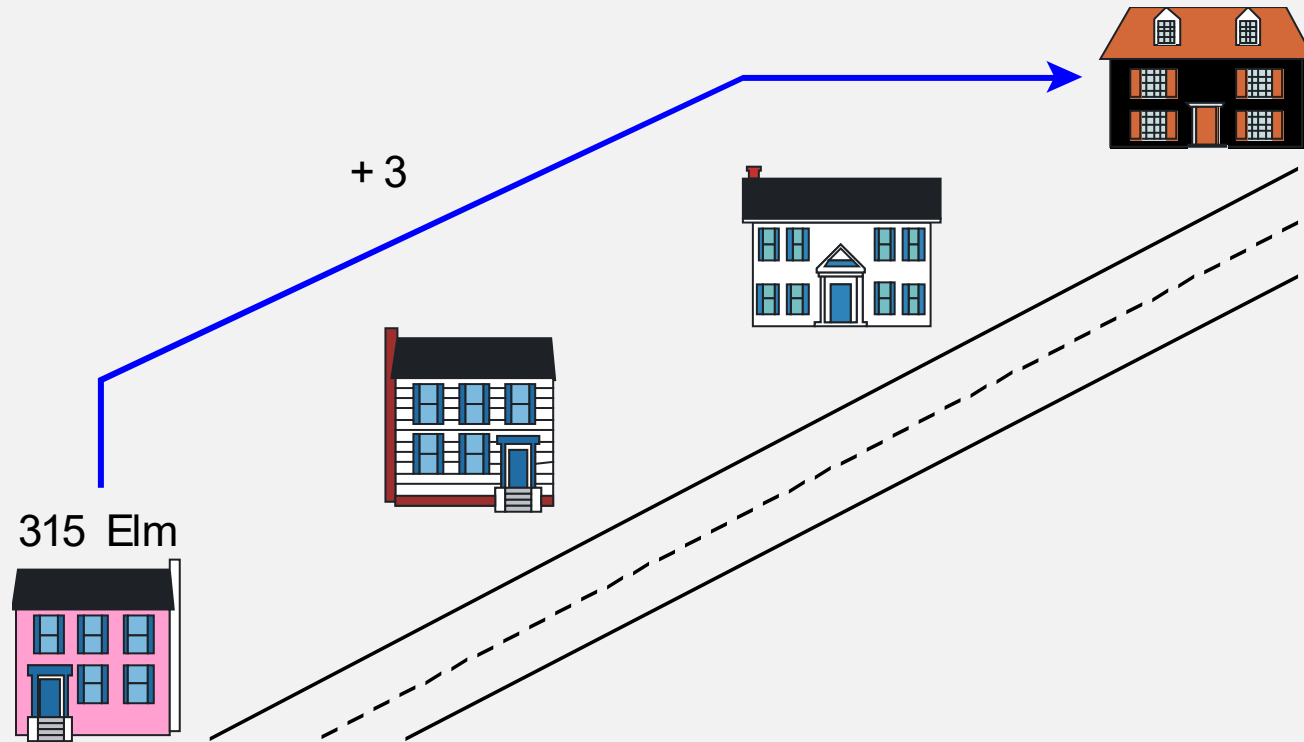
Delroy A. Brinkerhoff

TYPICAL UPCASTING

- `void render(Shape* s) { ... }`
- `Circle* c = new Circle;`
  - `Shape* s = c;`
  - `render(c);`
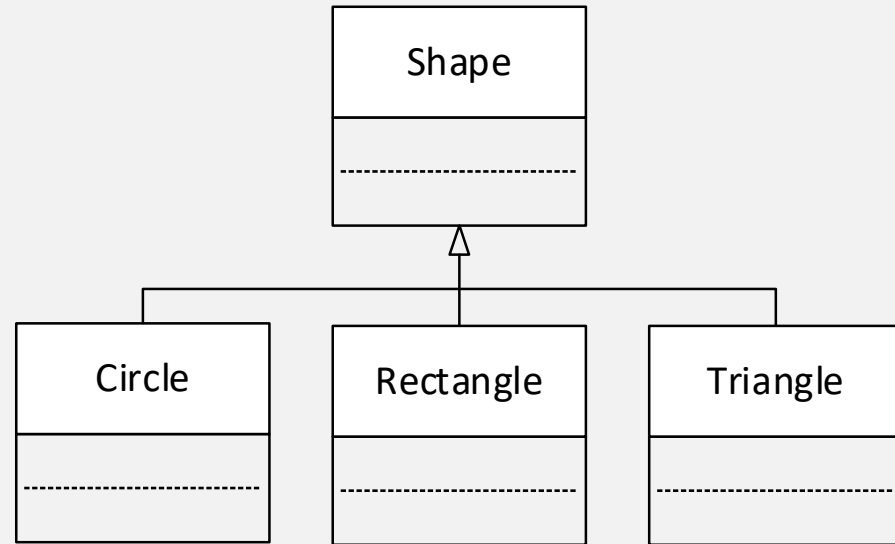
LOCATING BY OFFSET

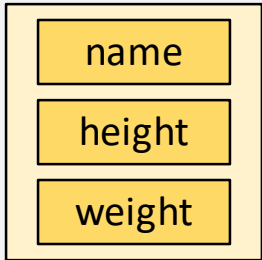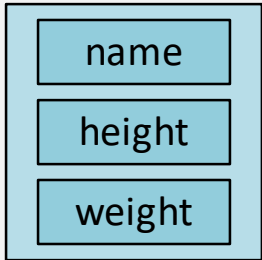# LOCATING MEMBER DATA

```
class Person
{
  private:
      string  name;
      double  height;
      int     weight;
};


Person* student
      = new Person(…);


Person* instructor
      = new Person(…);
```

name	student;
height	student + sizeof(name);
weight	student + sizeof(name) + sizeof(height);

name	instructor;
height	instructor + sizeof(name);
weight	instructor + sizeof(name) + sizeof(height);

INHERITANCE AND MEMBER VARIABLES

INHERITANCE AND MEMBER VARIABLES
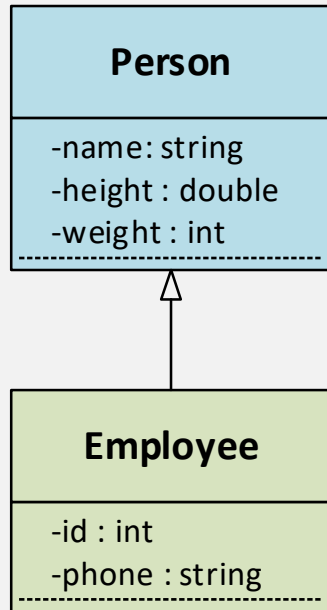

```cpp
class Person
{
  private:
      string      name;
      double      height;
      int         weight;
};


class Employee :
              public Person
{
  private:
      int         id;
      string      phone
};
```
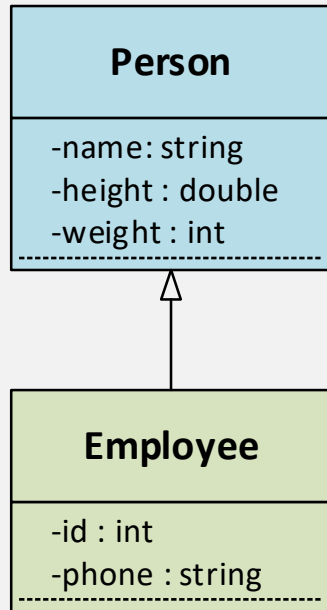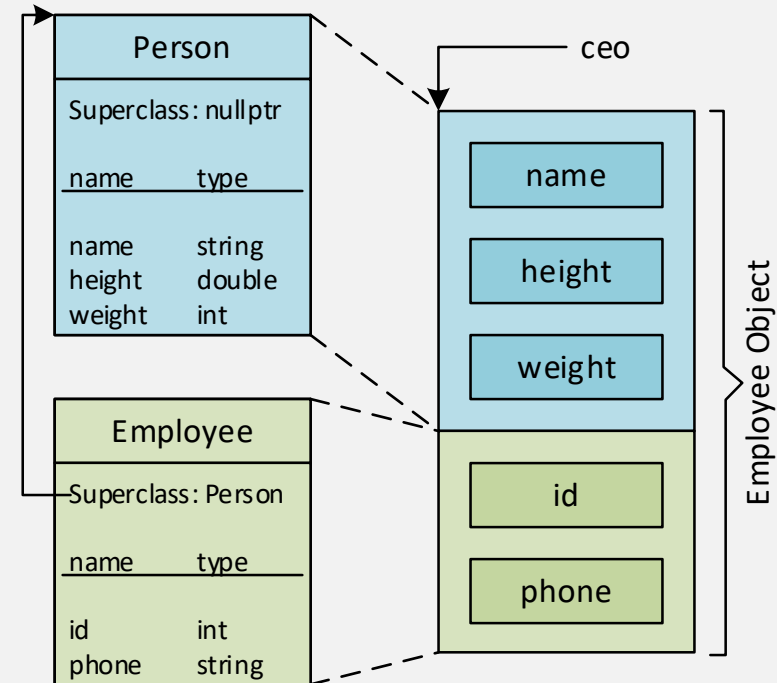
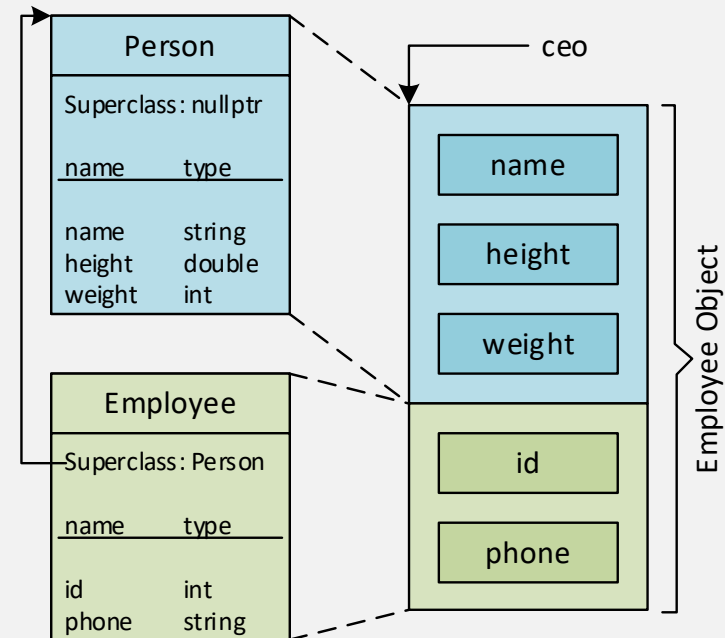**Employee* ceo = new Employee(...);**

INHERITANCE AND CASTING

- `Person* ceo = new Employee(...);`

INHERITANCE AND CASTING

- `Person* ceo = new Employee(...);`

INHERITANCE AND CASTING

- Person* ceo = new Employee(...);

- Employee* temp = (Employee *)ceo;