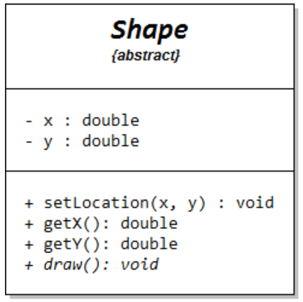
Creating an Abstract Class

Unlike Java and Python, C++ has no `abstract` keyword. Instead, in C++, an **Abstract Base Class** (or **ABC**) is any class that has one, or more, **pure virtual member functions**, created using the following syntax in the prototype:

```
class Shape     // abstract class
{
public:
    ...
    // Pure virtual function (abstract method)
    virtual void draw() const = 0;
    ...
};
```

Think of the `= 0;` part of syntax as a **replacement** for the `abstract` keyword in Java and Python.



Abstract classes are **not restricted** to abstract member functions like `draw()`; you can have as many regular (concrete) member functions as you'd like, freely mixed with your abstract methods.

The `Shape` class in the UML diagram at the right has a `setLocation()` member function. In UML, abstract methods, such as `draw()`, are drawn using italics.

Your concrete methods may **call** abstract methods as part of their definition, even though the member function is never implemented in the base class. Unlike Java, C++ pure virtual functions **may have an optional implementation**. Since you cannot create an instance of an abstract base class, you could only call this implementation from a derived class.