41012 Programming for Mechatronic Systems

Week 3

Example Class

```
class Rectangle {
public:
        Rectangle();
        void setWidthHeight (double width, double
height);
        double area ();
        double perimeter();
private:
        double width_, height_;
};
```

Polymorphism

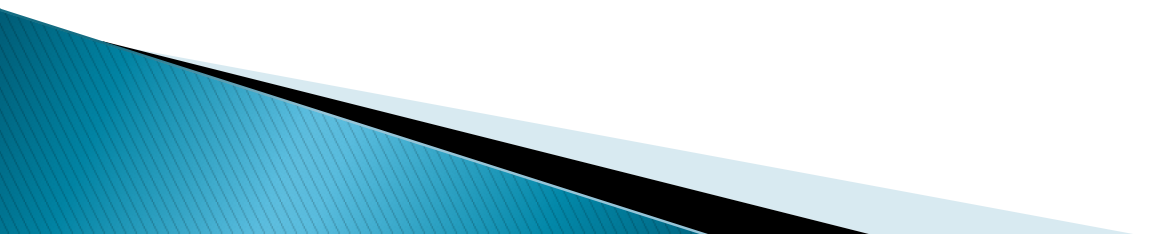
```
class Rectangle {
public:
        Rectangle();
        void setWidthHeight (double width, double height);
        void setWidthHeight (double side);
        double area ();
        double perimeter()
private:
        double width_, height_;
};
```

Questions:

- Provide an implementation of the function
  - If supplied one value what could we assume?

Polymorphism

- What if we want to have different types of shape?
- How can we make sure all shapes can compute area and perimeter?
- What should be in the base class?



Inheritance (Base Class)

```
class Shape{
public:
        Shape();
        double area ();
        double perimeter();
protected:
        double width_, height_;
};
```

- In class exercise :
  - Create a Shape, Base Class
  - Implement Rectangle as a child/subclass of Shape and use it in an executable.
  - Implement a child class for an isosceles Triangle and use it in an executable.
  - Use the create and triangle and rectangle and access them via a pointer to shape

Inheritance (Base Class)

```
class Shape{
public:
        Shape();
        double area ();
        double perimeter();
protected:
        double width_, height_;
};
```

- Questions
  - Does it make sense to create an object of the Shape class?