Computing for Mathematics: Handout 3

This handout contains a summary of the topics covered as well as outline of expected progress.

For further practice you can do the exercises available at the object oriented programming chapter of Python for Mathematics.

1   Expected progress

At the end of this week you should have a clear project defined.

- Have a concise answer to "What is the purpose of our library"?

- Have some general ideas about how your library would work.

- Have a list of similar and/or related tools.

At this stage I'd expect you to have a clear library in mind as well as early code and documentation in Jupyter notebooks

2   Summary

The programming topics covered in the functions and data structures are:

- Writing a class:

```python
class Polygon:
    """A class to represent a Polygon"""
    def __init__(self, number_of_sides):
        self.number_of_sides = number_of_sides

    def get_perimeter(self, length_of_side=None):
        """
        Computes the perimeter of the Polygon.

        If no side length is given, this assumes the unit length is the length
        of a given side.

        Parameters
        ----------
        length_of_side : int
            The length of a given side. The default is None.

        Returns
        -------
        float
            The perimeter of the polygon
        """
        return self.number_of_sides * length_of_side
```

- Create an instance of a class:

```
triangle = Polygon(number_of_sides=3)
```

- Call a method of a class:

```
triangle.get_perimeter(length_of_side=3)
```

- Use inheritance

```python
class Triangle(Polygon):
    """A class to represent polygons with 3 sides"""
    def __init__(self):
        self.number_of_sides = 3
```