Computing for Mathematics: Handout 2

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 functions and data structures chapter of Python for Mathematics.

1 Expected progress

At the end of this week you should have a few potential ideas for projects.

- For each of your ideas: what tools will be in your library?
- Have some early code for each of your ideas: this might help identify the coding techniques you will need to learn.
- Have an early conversation with me (Vince) about each idea.

> At this stage I'd expect you to have some ideas and code written in a Jupyter notebook

2 Summary

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

- Write docstrings:

```
def square(x):
    """
    Returns x ^ 2 + 1

    Parameters
    ----------
    x : float
        The element x

    Returns
    -------
    float
        The image
    """
    return x ** 2 + 1
```

- Create a set:

```
unique_values = {"one", 2, "3"}
```

- Do set operations:

```
unique_values = {"one", 2, "3"}
other_vaues = {1, 2, 3}
union = unique_values | other_values
```

```
intersection = unique_value & other_values
difference = unique_values - other_values
```

- Using hash tables (called dictionaries in Python):

```
id_numbers = {"Vince": 839, "Julien": 20, "Kaitlynn": 1049}
id_numbers["Vince"]
```