NUMPY

What is numpy? And why would we need it?

- C-like arrays **vs** python lists
- Designed partly by the designer of Python himself
- Advanced mathematical manipulation (at least partial replacement for Matlab)

```
import numpy as np
```

numpy is commonly reffered to as np

Features

- N-dimensional arrays (tensors)
- Support for data type specification (will not waste memory)
- Linear algebra operations. Ex:
  - Matrix inversion and transposing, and matrix multiplications
  - Solving Ax = b
- Creation of intervals (spaces)

Example of a space

```
x = np.linspace(0, 2, 100)
y = np.logspace(1, 1000000, 10)
```

Example of an n-dimensional array

```
a = np.array([[1, 2, 3],
              [3, 4, 6.7],
              [5, 9.0, 5]])
a = a.transpose
b = np.random.rand(3,3) # 3*3 random matrix from [0,1]
c = np.dot(a,b) # matrix multiplication
```