

### NumPy array basics

|                                                                            |                                                         |
|----------------------------------------------------------------------------|---------------------------------------------------------|
| <code>np.array([1, 2, 3])</code>                                           | Creates a 1D array with values 1, 2, 3. (shape 1x3)     |
| <code>np.array([(1, 2, 3), (4, 5, 6)])</code>                              | Creates 2D array of shape 2x3 with values 1,2,3,4,5,6   |
| <code>np.array([[(1, 2, 3), (4, 5, 6)], [(7, 8, 9), (10, 11, 12)]])</code> | Creates a 3D array with shape 2x2x3                     |
| <code>np.zeros(3, 4)</code>                                                | Creates a 3x4 array of zeros                            |
| <code>np.arange(1, 60, 5)</code>                                           | Creates a 1D array of values 1 through 60 at steps of 5 |
| <code>a.reshape(2, 3, 4)</code>                                            | Reshapes array a into an array of shape 2x3x4           |
| <code>a.shape</code>                                                       | To get the shape of the array a                         |

### Subsetting

|                         |                                                                           |
|-------------------------|---------------------------------------------------------------------------|
| <code>a[0]</code>       | Gets the 0th element in 1D array a                                        |
| <code>b[0, 0]</code>    | Gets the 0th element in 2D array b                                        |
| <code>c[0, 0, 0]</code> | Gets the 0th element in 3D array c                                        |
| <code>c[9, 0, 0]</code> | Gets the element which is the 0th element in the 0th row in the 9th depth |

### Slicing arrays

#### 1D arrays

|                     |                                                                     |
|---------------------|---------------------------------------------------------------------|
| <code>a[:]</code>   | Selects everything                                                  |
| <code>a[2:5]</code> | Selects the 2nd through the 4th rows (does not include the 5th row) |

#### 2D arrays

|                          |                                                                                               |
|--------------------------|-----------------------------------------------------------------------------------------------|
| <code>b[:, :]</code>     | Selects all rows and all columns                                                              |
| <code>b[:, 0]</code>     | Selects all rows, and the zeroth column                                                       |
| <code>b[0, :]</code>     | Selects the zeroth row, and all columns in that row                                           |
| <code>b[0:2, :]</code>   | Selects the zeroth and first row, but NOT the second. It includes all the columns in that row |
| <code>b[0:2, 0:2]</code> | Selects the zeroth and first row, and the zeroth and first column                             |

#### 3D arrays

|                         |                                            |
|-------------------------|--------------------------------------------|
| <code>c[:, :, :]</code> | Selects all rows and columns on all depths |
| <code>c[0, :, :]</code> | Selects the everything in the first depth  |
| <code>c[:, 0, :]</code> | Selects the first row of each depth        |
| <code>c[:, :, 0]</code> | Selects the first column of each depth     |

