- -> notebooks from this lecture: https://github.com/ine-rmotr-curriculum/freecodecamp-intro-to-numpy
- *-> how numpy is used*
    - -> processing large forms of data
    - -> for array and numeric processing
    - -> these arrays look like Python lists
    - -> we are creating two arrays
    - -> np.array
    - -> accessing the visual elements of a numpy array -> you can ask it for the [0]'th element of the list, for example
    - -> slicing works in the same way
    - -> this is a zero indexed language
- *-> multi indexing*
    - -> extracting three elements out of it
    - -> from B, I want to select these elements
    - -> you can pass another list containing the indices of the elements you want to contain
- *-> array types*
    - -> numpy arrays continuously assign memories
    - -> the type of the object which we're storing
    - -> providing a performance optimisation
    - -> numpy selects integers
    - -> you can also assign an array a different type (for example, a float)
    - -> a type integer 8
    - -> strings and regular objects <- you don't need numpy to store these
- *-> storing strings*
    - -> this is related to the unicode representation
- *-> dimensions and shapes*
    - -> you can create multidimensional arrays
    - -> attributes and functions
    - -> she shape of the array -> this is the rows by the columns
    - -> in this example there are two dimensions
    - -> then we have the size of the array
    - -> a 3D object / array
    - -> in another example, the array takes a specific shape and has a size <- the size is the count of the elements
    - -> you need to shape the array into something which has the correct amount of elements which you are trying to shape into it
- *-> to index and slice matrices*
    - -> this has to be similar to what was done before -> multiple dimensions
    - -> 012
    - -> index positions for slicing
    - -> to get the first element of the second row
    - -> select the second row and then the first element
    - -> you can also use numpty to do this selection
    - -> selectors for each one of the dimensions we are passing
    - *-> adding slicing*
        - -> you can select everything from one row to another
        - -> you can also pass other dimensions
        - -> he's doing a slicing example
- *-> you can set an array equal to an entire row*
    - -> so the dimensions match
    - -> using an expand operation
    - -> for row number 2, assign the number 99

- **-> numpy operations on arrays**
    - ○ -> summary statistics
    - ○ -> the standard deviation, variance, mean
    - ○ -> we can also do these summary statistics per axis
- **-> question**

What will the following code print out?

```
A = np.array([
    ['a', 'b', 'c'],
    ['d', 'e', 'f'],
    ['g', 'h', 'i']
])

print(A[:, :2])
```

[['a' 'b']]

[['b' 'c']
['e' 'f']
['h' 'i']]

[['a' 'b'] <- This one (until the second element, not including it)
['d' 'e']
['g' 'h']]