Activity

In a script called **A16-create-array.py**

1. Import NumPy

For questions 2, 3 and 4 figure out when to use arange() vs linspace()

1. Create a 1D array v in range [-1,1) (–1 included, and 1 excluded) in step of 0.25.

- print v
- print the type of v
- print the the type of the elements of v
- print the attributes of v : the shape, size and axis

3. Create a 1D array v1 of even integer numbers in range [0,10] (including both 0 and 10).

4. Create a 1D array v3 of 5 elements evenly spaced in range [–pi,pi]

Activity

In **A16-create-array.py**

Use Numpy functions and attributes

5. Create a 1D array of 0s with 5 elements, and print it to screen

6. Create a column vector b of 1s with 5 elements.

7. Create a matrix M with 6 rows and 2 columns of random integer numbers in range [1,20].

8. Print the transpose of M.

9. Convert M to a 1D array and print it to screen.

10. Store the number of rows and number of columns of M, in two separate variables. Use tuple unpacking. Use the variables to print a statement reporting the number of rows and number of columns. Do not format and do not concatenate.

```
There are 6 rows and 2 columns
```

Activity

In **A16-create-array.py**

Use Numpy functions and attributes

11. Create a matrix O of 1s, with 3 rows and 4 columns, and print it to screen

12. Reshape matrix O in a 6x2 matrix O1 and print O1 to screen.

13. Vertically concatenate O1 and M, store result in V, and print V to screen.

14. Horizontally concatenate O1 and M, store result in H, and print H to screen.

15. Convert the 1D array v to a list type L. Print L to screen.

16. Optional - Convert this list [1,100,1000] to a 1D array a1 of dtype float and print a1 to screen.

In a script called **A16-indexing-array.py**

1. Create a 1D array arr1 containing integer random numbers in range [0, 9].

2. Access and print the element at index 3 of arr1

3. Slice arr1 to obtain the subarray from index 2 to index 6 (inclusive). Print the sliced subarray.

4. Create a 1D array containing the indices [1, 3, 5].
Use idx to access and print the elements at the specified indices in arr1

5. Create a 2D NumPy array arr2 of shape (3, 4) containing random numbers in the half-open interval [0.0, 1.0)

6. Access and print the element at the 2nd row and 2nd column in arr2

7. Slice arr2 to obtain the subarray consisting of the first two rows and the first three columns. Print the sliced subarray.

In **A16-indexing-array.py**

8. Create a 1D array row_idx containing the row indices [0, 2].
   Create a 1D array col_idx containing the column indices [2, 1].
   Use row_idx and col_idx to access and print the elements at the specified row and column indices in arr2

9. Access and print the second row of arr2

10. Access and print the third column of arr2

Submit to A16:

- A16-create-array.py
- A16-indexing-array.py