

```
import numpy as np
```

```
# 1. Array Creation Techniques
```

```
print("1. Array Creation Techniques")
```

```
➦ 1. Array Creation Techniques
```

```
# a. Creating an array from a list
```

```
array_from_list = np.array([1, 2, 3, 4, 5])
```

```
array_from_list
```

```
➦ array([1, 2, 3, 4, 5])
```

```
# b. Using arange()
```

```
array_arange = np.arange(0, 10, 2)
```

```
array_arange
```

```
➦ array([0, 2, 4, 6, 8])
```

```
# c. Using linspace()
```

```
array_linspace = np.linspace(0, 10, 5) # Divides 0 to 10 into 5 points
```

```
array_linspace
```

```
➦ array([ 0. ,  2.5,  5. ,  7.5, 10. ])
```

```
# d. Using zeros()
```

```
array_zeros = np.zeros((3, 3))
```

```
array_zeros
```

```
➦ array([[0., 0., 0.],
        [0., 0., 0.],
        [0., 0., 0.]])
```

```
# e. Using ones()
```

```
array_ones = np.ones((2, 2))
```

```
array_ones
```

```
➦ array([[1., 1.],
        [1., 1.]])
```

```
# f. Using eye() for identity matrix
```

```
array_eye = np.eye(3)
```

```
array_eye
```

```
➦ array([[1., 0., 0.],
        [0., 1., 0.],
        [0., 0., 1.]])
```

```
# g. Using random() for random values
```

```
array_random = np.random.random((3, 3))
```

```
array_random
```

```
➦ array([[0.3194049 , 0.85750703, 0.48372929],
        [0.48591783, 0.04850303, 0.60685535],
        [0.6652718 , 0.3319404 , 0.65096444]])
```

```
# 2. Different NumPy Methods
```

```
print("\n2. NumPy Methods")
```

```
➦ 2. NumPy Methods
```

```
# a. Reshaping an array
```

```
reshaped_array = np.arange(1, 10).reshape(3, 3)
```

```
reshaped_array
```

```
➦ array([[1, 2, 3],
        [4, 5, 6],
        [7, 8, 9]])
```

```
# b. Transposing an array
transposed_array = reshaped_array.T
transposed_array
```

```
↵ array([[1, 4, 7],
         [2, 5, 8],
         [3, 6, 9]])
```

```
# c. Mathematical operations
array_math = np.array([1, 2, 3])
array_math + 2
array_math * 3
np.sqrt(array_math)
```

```
↵ array([1.          , 1.41421356, 1.73205081])
```

```
# d. Aggregation methods
np.sum(array_math)
np.mean(array_math)
np.max(array_math)
np.min(array_math)
```

```
↵ np.int64(1)
```

```
# e. Concatenation of arrays
array_a = np.array([1, 2, 3])
array_b = np.array([4, 5, 6])
concat_array = np.concatenate((array_a, array_b))
concat_array
```

```
↵ array([1, 2, 3, 4, 5, 6])
```

```
# f. Sorting an array
unsorted_array = np.array([3, 1, 4, 2])
sorted_array = np.sort(unsorted_array)
sorted_array
```

```
↵ array([1, 2, 3, 4])
```

```
# g. Indexing and Slicing
indexed_value = array_math[1] # Indexing
indexed_value
sliced_array = array_math[1:3] # Slicing
sliced_array
```

```
↵ array([2, 3])
```

```
# h. Boolean Masking
boolean_mask = array_math > 2
boolean_mask
array_math[boolean_mask]
```

```
↵ array([3])
```

