Experiment09

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SE - 48

```python
[19]: import numpy as np
```

```python
[20]: # 1. Array Creation Techniques
      print("1. Array Creation Techniques")
```

1. Array Creation Techniques

```python
[21]: # a. Creating an array from a list
      array_from_list = np.array([1, 2, 3, 4, 5])
      array_from_list
```

```python
[21]: array([1, 2, 3, 4, 5])
```

```python
[22]: # b. Using arange()
      array_arange = np.arange(0, 10, 2)
      array_arange
```

```python
[22]: array([0, 2, 4, 6, 8])
```

```python
[23]: # c. Using linspace()
      array_linspace = np.linspace(0, 10, 5)  # Divides 0 to 10 into 5 points
      array_linspace
```

```python
[23]: array([ 0. ,  2.5,  5. ,  7.5, 10. ])
```

```python
[24]: # d. Using zeros()
      array_zeros = np.zeros((3, 3))
      array_zeros
```

```python
[24]: array([[0., 0., 0.],
             [0., 0., 0.],
             [0., 0., 0.]])
```

```python
[25]: # e. Using ones()
      array_ones = np.ones((2, 2))
      array_ones
```

```
[25]: array([[1., 1.],
             [1., 1.]])
```

```
[26]: # f. Using eye() for identity matrix
      array_eye = np.eye(3)
      array_eye
```

```
[26]: array([[1., 0., 0.],
             [0., 1., 0.],
             [0., 0., 1.]])
```

```
[27]: # g. Using random() for random values
      array_random = np.random.random((3, 3))
      array_random
```

```
[27]: array([[0.46301982, 0.97489598, 0.53979614],
             [0.42102937, 0.57458196, 0.70661145],
             [0.95281129, 0.78937898, 0.81926951]])
```

```
[28]: # 2. Different NumPy Methods
      print("\n2. NumPy Methods")
```

2. NumPy Methods

```
[29]: # a. Reshaping an array
      reshaped_array = np.arange(1, 10).reshape(3, 3)
      reshaped_array
```

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

```
[30]: # b. Transposing an array
      transposed_array = reshaped_array.T
      transposed_array
```

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

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

```
[31]: array([1.        , 1.41421356, 1.73205081])
```

```python
[32]:  # d. Aggregation methods
       np.sum(array_math)
```

[32]: 6

```python
[33]:  np.mean(array_math)
```

[33]: 2.0

```python
[34]:  np.max(array_math)
```

[34]: 3

```python
[35]:  np.min(array_math)
```

[35]: 1

```python
[36]:  # 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
```

[36]: array([1, 2, 3, 4, 5, 6])

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

[37]: array([1, 2, 3, 4])

```python
[41]:  # g. Indexing and Slicing
       indexed_value = array_math[1]   # Indexing
       indexed_value
```

[41]: 2

```python
[40]:  sliced_array = array_math[1:3]   # Slicing
       sliced_array
```

[40]: array([2, 3])

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

[42]: array([3])