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Roll No: 33

Numpy Techniques

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

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

1. Array Creation Techniques

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

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

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

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

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

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

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

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

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

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

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

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

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

```
Out[27]: array([[0.86636852, 0.5524452 , 0.04101204],
               [0.18211762, 0.39604996, 0.07929499],
               [0.94078462, 0.48834313, 0.18475138]])
```

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

2. NumPy Methods

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

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

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

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

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

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

```
In [32]: # d. Aggregation methods
np.sum(array_math)
np.mean(array_math)
np.max(array_math)
np.min(array_math)
```

```
Out[32]: np.int64(1)
```

```
In [33]: # 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
```

Out[33]: array([1, 2, 3, 4, 5, 6])

```
In [34]: # f. Sorting an array
         unsorted_array = np.array([3, 1, 4, 2])
         sorted_array = np.sort(unsorted_array)
         sorted_array
```

Out[34]: array([1, 2, 3, 4])

```
In [35]: # g. Indexing and Slicing
         indexed_value = array_math[1] # Indexing
         indexed_value
```

Out[35]: np.int64(2)

```
In [36]: sliced_array = array_math[1:3] # Slicing
         sliced_array
```

Out[36]: array([2, 3])

```
In [37]: # h. Boolean Masking
         boolean_mask = array_math > 2
         boolean_mask
```

Out[37]: array([False, False, True])

```
In [38]: array_math[boolean_mask]
```

Out[38]: array([3])