Data Mining

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1) Write a Python program to do the following operations:

a) Create multi-dimensional arrays and find its shape and dimension

code:

```
import numpy as np


array1 = np.array([[1, 2, 3], [4, 5, 6]])
print("Array:\n", array1)
print("Shape:", array1.shape)
print("Dimensions:", array1.ndim)
```

b) Create a matrix full of zeros and ones

Code:

```
zeros_matrix = np.zeros((3, 4))
ones_matrix = np.ones((2, 3))
print("\nZeros:\n", zeros_matrix)
print("Ones:\n", ones_matrix)
```

c) Reshape and flatten data in the array

code:

```
reshaped_array = array1.reshape(3, 2)
flattened_array = array1.flatten()
print("\nReshaped Array:\n", reshaped_array)
print("Flattened Array:", flattened_array)
```

d) Append data vertically and horizontally

code:

```
array2 = np.array([[7, 8, 9], [10, 11, 12]])
vertical_stack = np.vstack((array1, array2))
horizontal_stack = np.hstack((array1, array2))
print("\nVertical Stack:\n", vertical_stack)
print("Horizontal Stack:\n", horizontal_stack)
```

e) Apply indexing and slicing on array

code:

```
print("\nElement at (0,1):", array1[0, 1])
print("First row:", array1[0])
print("Last column:", array1[:, -1])
```

f) Use statistical functions on array - Min, Max, Mean, Median and Standard Deviation

code:

```
print("\nMin:", np.min(array1))
print("Max:", np.max(array1))
print("Mean:", np.mean(array1))
print("Median:", np.median(array1))
print("Standard Deviation:", np.std(array1))
```