

devanshu-finlatics-3

April 15, 2024

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[2]: #Q1
import numpy as np

# Initialize a 3x3 NumPy array with integer values
arr = np.array([[1, 2, 3],
                [4, 5, 6],
                [7, 8, 9]])

print("Original Array:")
print(arr)

# Multiply the entire array by 2
arr_multiplied = arr * 2
print("\nArray multiplied by 2:")
print(arr_multiplied)

# Add 5 to each element of the array
arr_added_5 = arr + 5
print("\nArray with 5 added to each element:")
print(arr_added_5)

# Calculate the square of each element in the array
arr_squared = arr ** 2
print("\nArray with each element squared:")
print(arr_squared)
```

Original Array:

```
[[1 2 3]
 [4 5 6]
 [7 8 9]]
```

Array multiplied by 2:

```
[[ 2  4  6]
 [ 8 10 12]
 [14 16 18]]
```

Array with 5 added to each element:

```
[[ 6  7  8]
```

```
[ 9 10 11]
[12 13 14]]
```

Array with each element squared:

```
[[ 1  4  9]
 [16 25 36]
 [49 64 81]]
```

```
[3]: #Q2
import numpy as np

# Initialize a 3x3 NumPy array with integer values
arr = np.array([[1, 2, 3],
                [4, 5, 6],
                [7, 8, 9]])

print("Original Array:")
print(arr)

# Extract the first row of the array
first_row = arr[0]
print("\nFirst Row:")
print(first_row)

# Extract the last column of the array
last_column = arr[:, -1]
print("\nLast Column:")
print(last_column)

# Extract a 2x2 sub-array from the center of the original array
sub_array = arr[1:3, 1:3]
print("\n2x2 Sub-array from the center:")
print(sub_array)
```

Original Array:

```
[[1 2 3]
 [4 5 6]
 [7 8 9]]
```

First Row:

```
[1 2 3]
```

Last Column:

```
[3 6 9]
```

2x2 Sub-array from the center:

```
[[5 6]
 [8 9]]
```

```
[4]: #Q3
import pandas as pd

# Create DataFrame to store names and marks of students
data = {'Name': ['Student1', 'Student2', 'Student3', 'Student4', 'Student5', 'Student6', 'Student7', 'Student8', 'Student9', 'Student10'],
        'Marks': [80, 75, 90, 85, 78, 92, 88, 70, 95, 82]}

df = pd.DataFrame(data)

print(df)
```

	Name	Marks
0	Student1	80
1	Student2	75
2	Student3	90
3	Student4	85
4	Student5	78
5	Student6	92
6	Student7	88
7	Student8	70
8	Student9	95
9	Student10	82

```
[5]: #Q4
import pandas as pd

# Create DataFrame representing names and income of employees
data = {'Employee_name': ['John', 'Emily', 'Michael', 'Sarah', 'David'],
        'Income': [50000, 60000, 55000, 70000, 48000]}

df = pd.DataFrame(data, index=['a', 'b', 'c', 'd', 'e'])

print(df)
```

	Employee_name	Income
a	John	50000
b	Emily	60000
c	Michael	55000
d	Sarah	70000
e	David	48000

```
[6]: #Q5
import matplotlib.pyplot as plt

x = ['A', 'B', 'C', 'D', 'E']
y = [10, 20, 15, 25, 30]
```

```
plt.bar(x, y)
plt.xlabel('Categories')
plt.ylabel('Frequency')
plt.title('Frequency of Occurrences for Categories A, B, C, D, and E')
plt.show()
```

