

Python & NumPy Programs

1. Append values to the end of a NumPy array

```
import numpy as np
arr = np.array([1, 2, 3])
arr = np.append(arr, [4, 5])
print(arr)
```

2. Sum of first N natural numbers using while loop

```
n = int(input("Enter N: "))
i = 1
total = 0
while i <= n:
    total += i
    i += 1
print("Sum =", total)
```

3. Sum of first n natural numbers using recursion

```
def recursive_sum(n):
    if n == 0:
        return 0
    return n + recursive_sum(n-1)

n = int(input("Enter N: "))
print("Sum =", recursive_sum(n))
```

4. Convert Centigrade to Fahrenheit using NumPy

```
import numpy as np
centigrade = np.array([0, 20, 37, 100])
fahrenheit = centigrade * 9/5 + 32
print(fahrenheit)
```

5. Cube of first N natural numbers in a single line

```
n = int(input("Enter N: "))
print([i**3 for i in range(1, n+1)])
```

6. Find common values between two NumPy arrays

```
import numpy as np
a = np.array([1, 2, 3, 4])
b = np.array([3, 4, 5, 6])
common = np.intersect1d(a, b)
print("Common values:", common)
```

7. Number to month and days

```
months = {
    1: ("January", 31),
    2: ("February", 28),
    3: ("March", 31),
    4: ("April", 30),
    5: ("May", 31),
    6: ("June", 30),
    7: ("July", 31),
    8: ("August", 31),
    9: ("September", 30),
    10: ("October", 31),
    11: ("November", 30),
    12: ("December", 31)
}
n = int(input("Enter month number (1-12): "))
if 1 <= n <= 12:
    print("Month:", months[n][0], ", Days:", months[n][1])
else:
    print("Invalid month")
```

8. Indices of max and min values in a NumPy array

```
import numpy as np
arr = np.array([[10, 20, 5], [30, 15, 25]])
print("Max Index:", np.argmax(arr, axis=1))
print("Min Index:", np.argmin(arr, axis=1))
```

9. Number to weekday

```
days = ["Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday", "Sunday"]
n = int(input("Enter day number (1-7): "))
if 1 <= n <= 7:
    print("Day:", days[n-1])
else:
    print("Invalid input")
```

10. Sum of elements > 10 in a NumPy array

```
import numpy as np
arr = np.array([5, 12, 7, 15, 3])
result = arr[arr > 10].sum()
print("Sum of elements > 10:", result)
```