

# Practical No. 3

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**Q. Prepare/Take [datasets](#) for any real-life application. Read a [dataset](#) into an array. Perform the following operations on it:**

1. **Perform all matrix operations**
2. **Horizontal and vertical stacking of Numpy Arrays**
3. **Custom sequence generation**
4. **Arithmetic and Statistical Operations, Mathematical Operations, Bitwise Operators**
5. **Copying and viewing arrays**
6. **Data Stacking, Searching, Sorting, Counting, Broadcasting**

**Code:-**

```
import numpy as np
```

```
m1=np.array([[2,4,6],[8,1,3],[5,7,9]])
```

```
m2=np.array([[12,13,14],[10,11,5],[9,15,10]])
```

```
#addition add_result=m1+m2
```

```
print("add result:") print(add_result)
```

```
#subtraction
```

```
sub_result=m1-m2 print("sub  
result:") print(sub_result)
```

```
# multiplication
```

```
multiplication_result=np.dot(m1,m2)  
print("multiplication result:")  
print(multiplication_result)
```

```
# division
```

```
division_result=m2%m1 print("division  
result:") print(division_result)
```

```
#inverse inverse_result=np.linalg.inv(m1)  
print("\n inverse result:") print(inverse_result)
```

```
#transpose
```

```
transpose_result=np.linalg.inv(m1) print("\n  
transpose result:") print(transpose_result)
```

#view

```
array=np.array([2,4,10,11,5])  
array.view array[0]=50  
print("array view:")  
print(array)
```

#copy

```
array=np.array([2,4,10,11,5])  
array.copy print("array  
copy:") print(array)
```

#Horizontal and vertical stacking

```
verticalstack_result=np.vstack((m1,m2))  
print("vertical stack:") print(verticalstack_result)
```

```
Horizontalstack_result=np.hstack((m1,m2))  
print("Horizontal stack:")  
print(Horizontalstack_result)
```

# Bitwise Operators

```
bitwise_and = np.bitwise_and(m1,m2)  
print("bitwise_and:") print(bitwise_and)
```

```
bitwise_or = np.bitwise_or(m1,m2)  
print("bitwise_or:") print(bitwise_or)
```

# OUTPUT:-

```
IDLE Shell 3.11.4
File Edit Shell Debug Options Window Help
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun 7 2023, 05:45:37) [MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Users/Admin/s1.py =====
add result:
[[14 17 20]
 [18 12 8]
 [14 22 19]]
sub result:
[[-10 -9 -8]
 [-2 -10 -2]
 [-4 -8 -1]]
multiplication result:
[[118 160 108]
 [133 160 147]
 [211 277 195]]
division result:
[[0 1 2]
 [2 0 2]
 [4 1 1]]

inverse result:
[[-0.22222222 0.11111111 0.11111111]
 [-1.05555556 -0.22222222 0.77777778]
 [ 0.94444444 0.11111111 -0.55555556]]

transpose result:
[[-0.22222222 0.11111111 0.11111111]
 [-1.05555556 -0.22222222 0.77777778]
 [ 0.94444444 0.11111111 -0.55555556]]
array view:
[50  4 10 11  5]
array copy:
[ 2  4 10 11  5]
vertical stack:
[[ 2  4  6]
 [ 8  1  3]
 [ 5  7  9]
 [12 13 14]
 [10 11  5]
 [ 9 15 10]]
Horizontal stack:
[[ 2  4  6 12 13 14]
 [ 8  1  3 10 11  5]
 [ 5  7  9  9 15 10]]
Horizontal stack:
[[ 2  4  6 12 13 14]
 [ 8  1  3 10 11  5]
 [ 5  7  9  9 15 10]]
bitwise_and:
[[0 4 6]
 [8 1 1]
 [1 7 8]]
bitwise_or:
[[14 13 14]
 [10 11  7]
 [13 15 11]]
```