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:-

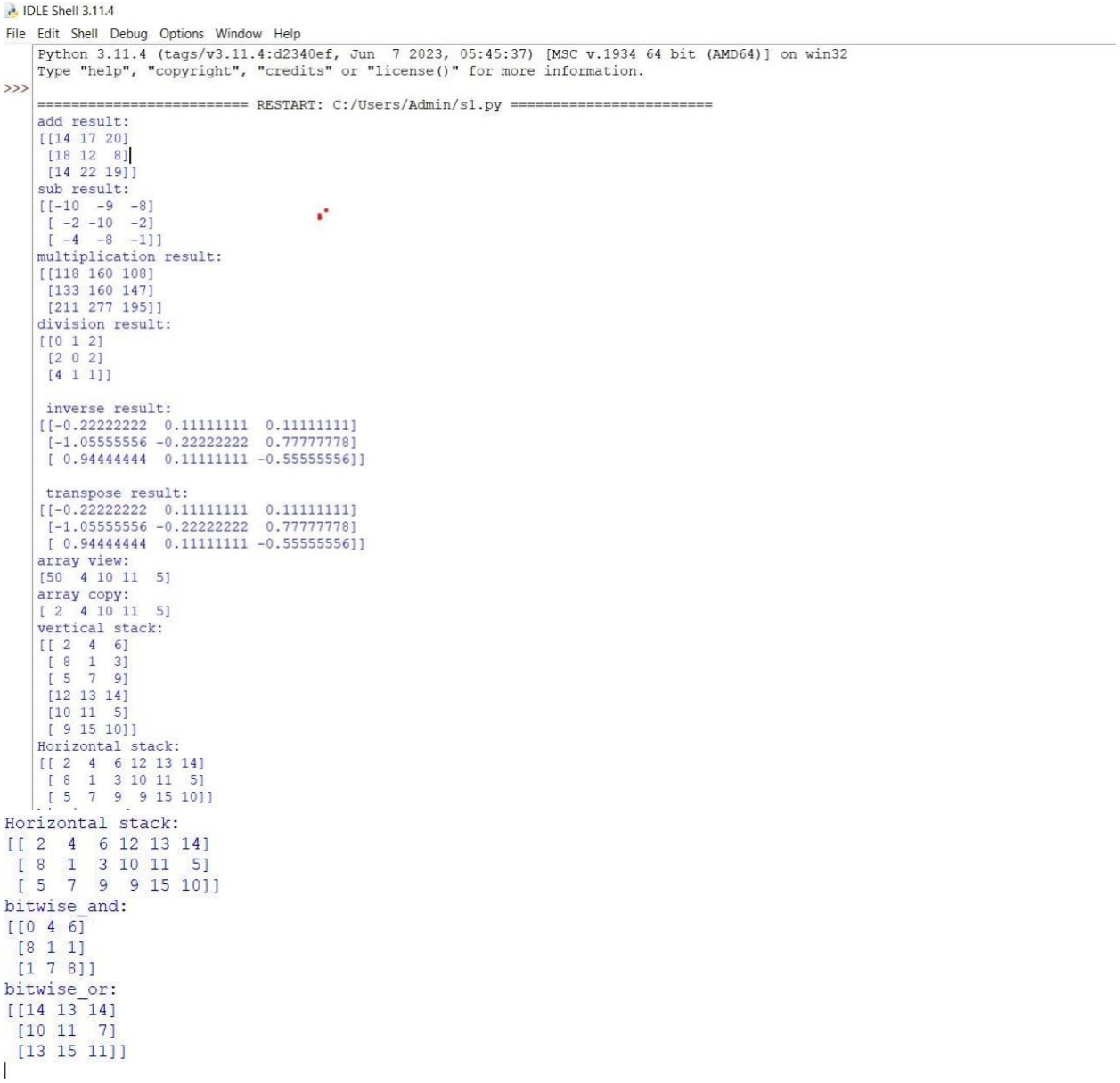
```
import numpy as np


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)

#coppy

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]]
```