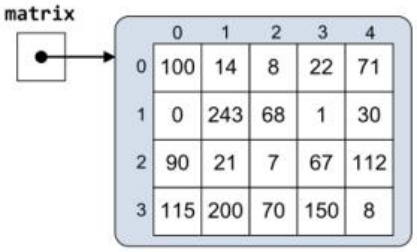
LECTURE

SIX

Multidimensional Lists

Some kinds of information are better represented n-dimensionally, in a rectangular list of elements, also known as a matrix; for example,



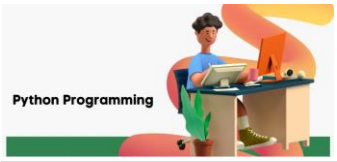

```
matrix = [[100,  14,   8,  22,  71],
          [  0, 243,  68,   1,  30],
          [ 90,  21,   7,  67, 112],
          [115, 200,  70, 150,   8]]
```

Note the double square brackets for access. The first index (2) selects the row, and the second index (3) specifies the column. For example: matrix[2][3])

Example: multi-List and Modifying Elements
a = [[1, 2, 3], [4, 5, 6]] print(a[0]) print(a[1]) print(a[0][2]) a[0][1] = 7 print(a)

Output

[1, 2, 3]
[4, 5, 6]
3
[[1, 7, 3], [4, 5, 6]]

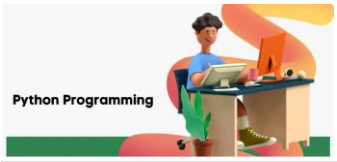


Example (7): Write Python Program to read 2D list and print each item in 2D list.

```
ls = []
ls.append([])
ls.append([])

for i in range(2):
        for j in range(2):
                x=int(input("enter item ="))
                ls[i].append(x)

for i in range(2):
        for j in range(2):
                print(ls[i][j])
```

Example (8): Write Python Program to read 2D list and sum all the items in 2D list

```
ls = []
ls.append([])
ls.append([])

for i in range(2):
        for j in range(2):
                x=int(input("enter item ="))
                ls[i].append(x)
s=0
for i in range(2):
        for j in range(2):
                s+=ls[i][j]
print(s)
```

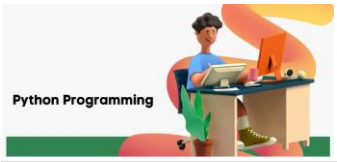


Example (9): Write Python Program to read 2D list and print the first diagonal item in 2D list.

```
ls = []
ls.append([])
ls.append([])

for i in range(2):
        for j in range(2):
                x=int(input("enter item ="))
                ls[i].append(x)

for i in range(2):
        for j in range(2):
                if i==j:
                        print(ls[i][j])
```

Example (10): Write Python Program to read 2D list and print upper triangular items in 2D list

```
ls = []
ls.append([])
ls.append([])

for i in range(2):
        for j in range(2):
                x=int(input("enter item ="))
                ls[i].append(x)

for i in range(2):
        for j in range(2):
                if i<=j:
                        print(ls[i][j])
```



Example (11): Write a Python function that takes a 2D list matrix = [[1, 2],[4, 5]] and returns its transpose using function called “transpose_matrix”

```
def transpose_matrix(matrix):
    transpose = [[0] * 2 for j in range(2)]
    for i in range(2):
        for j in range(2):
            transpose [j][i] = matrix[i][j]
    return transpose

matrix = [ [1, 2],
           [4, 5]]
transpose = transpose_matrix(matrix)
print(transpose)
```