

COMPUTER SCIENCE AND DA

Data Structures through Python

Lists and Arrays

Lecture No. 03



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RECAP OF PREVIOUS CLASS



MULTIDIMENSIONAL ARRAYS

$y = x[2:6]$
 $z = y[:4]$

$y = [2, 3, 1, [0, 2], 4]$
 $z = [2, 3, 1, [0, 2], 4]$

Ex $x = [1, 0, [2, 3, 1, [0, 2], 4], 5, 3]$

0, 1, 2, 3, 4

$ans = len(x[2][3])$



$y = x[2:3]$
 $z = y[:3]$



for i in range(len(x)):
for j in range(len(x[2])):

$ans += len(y) + len(z)$

$ans = ans + len(y) + len(z)$

print(ans)

range(5)
stop
0, 1, 2, 3, 4
 $2 + 2 + 5 = 9$



TOPICS TO BE COVERED



1) Mult-Dimensional Array

2) Problem.



Multi Dimensional Array



$a = [1, 2, 3, [4, 5, [6, 7, 8], 9], 0]$

$b = a[::-1] \Leftarrow [b = [0, [4, 5, [6, 7, 8], 9], 3, 2, 1]]$

$\Rightarrow c = b[0: \text{len}(b): 2] \Rightarrow c = [0, 3, 1]$

$0, 0+2=2, 2+2=4$
 $d = c[::-1] \Rightarrow d = [1, 3, 0]$

$\text{result} = \text{len}(b) + \text{len}(c) - \text{len}(d) = 5 + 3 - 3 = 5$

$0, 2, 7$

for i in $\text{range}(\text{len}(c))$:

for j in $\text{range}(\text{len}(d))$:

$\text{result} -= c[i] - d[j]$

$\text{print}(\text{result})$

$\text{result} = \text{result} - (c[i] - d[j])$
 $\text{result} = \text{result} + d[j] - c[i]$

$i=0$

$j=0$

result

$5 + 1 - 0 = 6$

$j=1$

$6 + 3 - 0 = 9$

$j=2$

$9 + 0 - 0 = 9$

$j=0$

$9 + 1 - 3 = 7$

$j=1$

$7 + 3 - 3 = 7$

$j=2$

$7 + 0 - 3 = 4$

$j=0$

$4 + 1 - 1 = 4$

$j=1$

$4 + 3 - 1 = 6$

$j=2$

$4 + 0 - 1 = 3$

$6 + 0 - 1$

$= 5$



ARRAY IMPLEMENTATION



array()
import array ↓ type
arr = array.array('i', [1, 2, 3])
print(arr[1]) ⇒ 2

numpy
import numpy as np
arr = np.array([1, 2, 3])
print(arr[2])
 ↓
 3



COMPARISON

→ list
non-homogeneous

=> non-contiguous

array 1
homogeneous

contiguous

array 2
homogeneous
contiguous



2D, 3D X

THANK - YOU