

COMPUTER SCIENCE AND DA

Data Structures through Python

Lists and Arrays

Lecture No. 04



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TOPICS TO BE COVERED



1) Mult-Dimensional Array

2) Problem.



Time Complexity

$a = [1, 2, 3, 4, 5, 6]$ $\rightarrow O(1)$

Diagram illustrating an array a with elements $1, 2, 3, 4, 5, 6$. Red arrows show sequential access from index 0 to 5. Yellow arrows show a jump from index 0 to index 7, indicating a deletion operation.

Delete

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

$O(n)$

$a[s]$

Access

$O(1)$



PRACTICE PROBLEM

$x = [1, -1, -2, 2, -3, 3]$

$y = [0, 1, 3, 2, 6, 2, 5, 4]$

$l1 = x[0:6:2]$

$l2 = y[: -3]$

$O(m \times n)$

count = 0

for i in l1:

for j in l2:

count -= i - j

print(count)

count = count - (i - j)
= count - i + j

$l1 = [1, -2, -3]$

$l2 = [0, 1, 3, 2, 6]$

count = 0

(12)
(36)
(-5) + 10
+ 5
(20)
(56)

i = 1

i = 2

i = -3

j = 0

0 - 1 + 0
= -1

9

32

1

-1 - 1 + 1
= -1

12

36

(3)

-1 - 1 + 3
= 1

17

42

2

2

21

47

6

7

29

(56)



PRACTICE PROBLEM



list = [11, 22, 11, 23, 11, 24, 12]

count = len(list) \Rightarrow 7

for i in list:

for j in range(len(list))

count += i - j

print(count)

count = count + i - j

$$\begin{aligned} & 7 + 77 + 154 + 77 + 161 + 77 \\ & + 168 + 84 - 147 \\ & = \boxed{658} \end{aligned}$$

$$(77) - 21$$

$$i = 11$$

$$i = 22$$

$$i = 11$$

$$i = 23$$

$$i = 11$$

$$i = 24$$

$$i = 12$$

$$j = 0$$

$$7 + \overbrace{77 - 21}$$

$$7 \times 22 - 21$$

$$7 \times 11 - 21$$

$$7 \times 23 - 21$$

$$7 \times 11 - 21$$

$$7 \times 24 - 21$$

$$7 \times 12 - 21$$

$$\begin{aligned} & 7 \times 21 \\ & \underline{147} \end{aligned}$$

$$\begin{aligned} & -0-1-2-3-4-5-6 \\ & -(0+1+2+3+4+5+6) = -21 \end{aligned}$$

THANK - YOU