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Stack & Queue -Part V

Course on Data Structure

Pankaj Sharma • Lesson 18 • July 28, 2024

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CS & IT Engineering

Data Structure

Stack & Queue

Lecture Number- 18

By- Pankaj Sir

A function f defined on stacks of integers satisfies the following properties:

$f(\phi) = 0$

and

$f(\text{Push}(s, i)) = \max(f(s), 0) + i$ for all stack S and integer i

If a stack S contains the integers 2, -3, 2, -1, 2 in order from bottom to top, what is f(s)?

A) 6 B) 4 C) 3 ✓ D) 2

① $f(\text{stack is Empty}) = 0$

② $f(\text{Push}(s,i)) = \max(f(s), 0) + i$

a) $f(\text{Push}(s,2)) = \max(0,0) + 2 = 2$

b) $f(\text{Push}(s,-3)) = \max(2,0) + (-3) = 2 + (-3) = -1$

c) $f(\text{Push}(s,2)) = \max(-1,0) + (2) = 0 + 2 = 2$

d) $f(\text{Push}(s,-1)) = \max(2,0) + (-1) = 2 - 1 = 1$

e) $f(\text{Push}(s,2)) = \max(1,0) + 2 = 1 + 2 = 3$

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Topics

to be covered

1. Stack & Queue

Q2. The result of evaluating the postfix expression

10 5 + 60 6 / * 8 -

A) 284

B) 213

C) 142

D) 71

10 5 + 60 6 / * 8 -

15 60 6 / * 8 -

15 10 * 8 -

150 8 -

142

Q3 The best data structure to check whether an arithmatic exp. has balanced paranthesis is

A) queue B) stack C) Tree D) list

)()(✗

(a+b) x (d x e)

( )( ) ✓

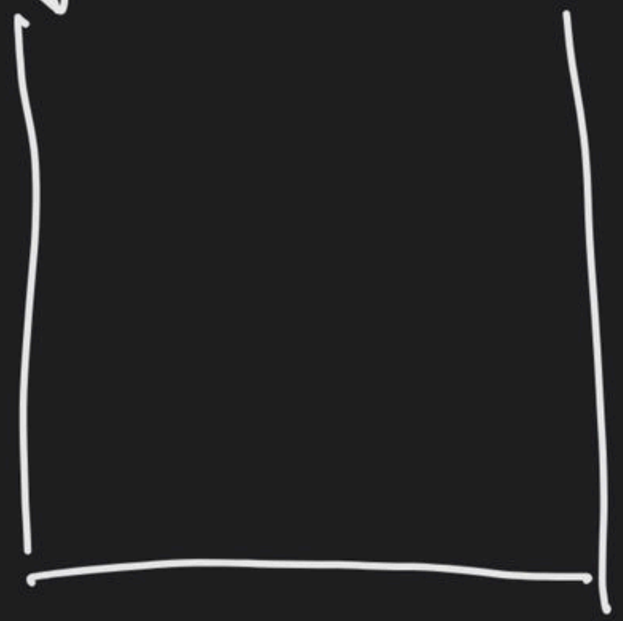
((a+b) x (d x e))

(( )( )) ✓

left parenthesis

exit

(( ))



S

2 1

(( ) ( ))

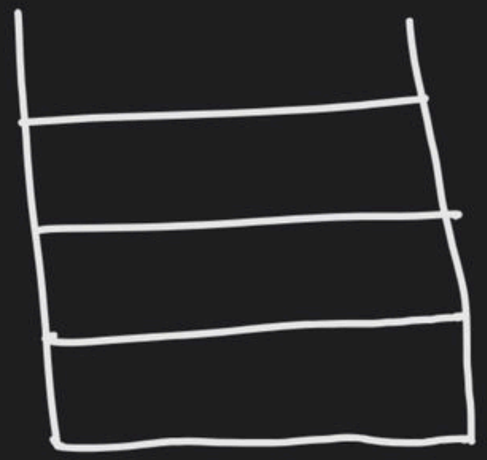
For every right parenthesis

⇓

Most recently occ. left parenthesis

(( ))

i/p ⇒ (( ) ( ))



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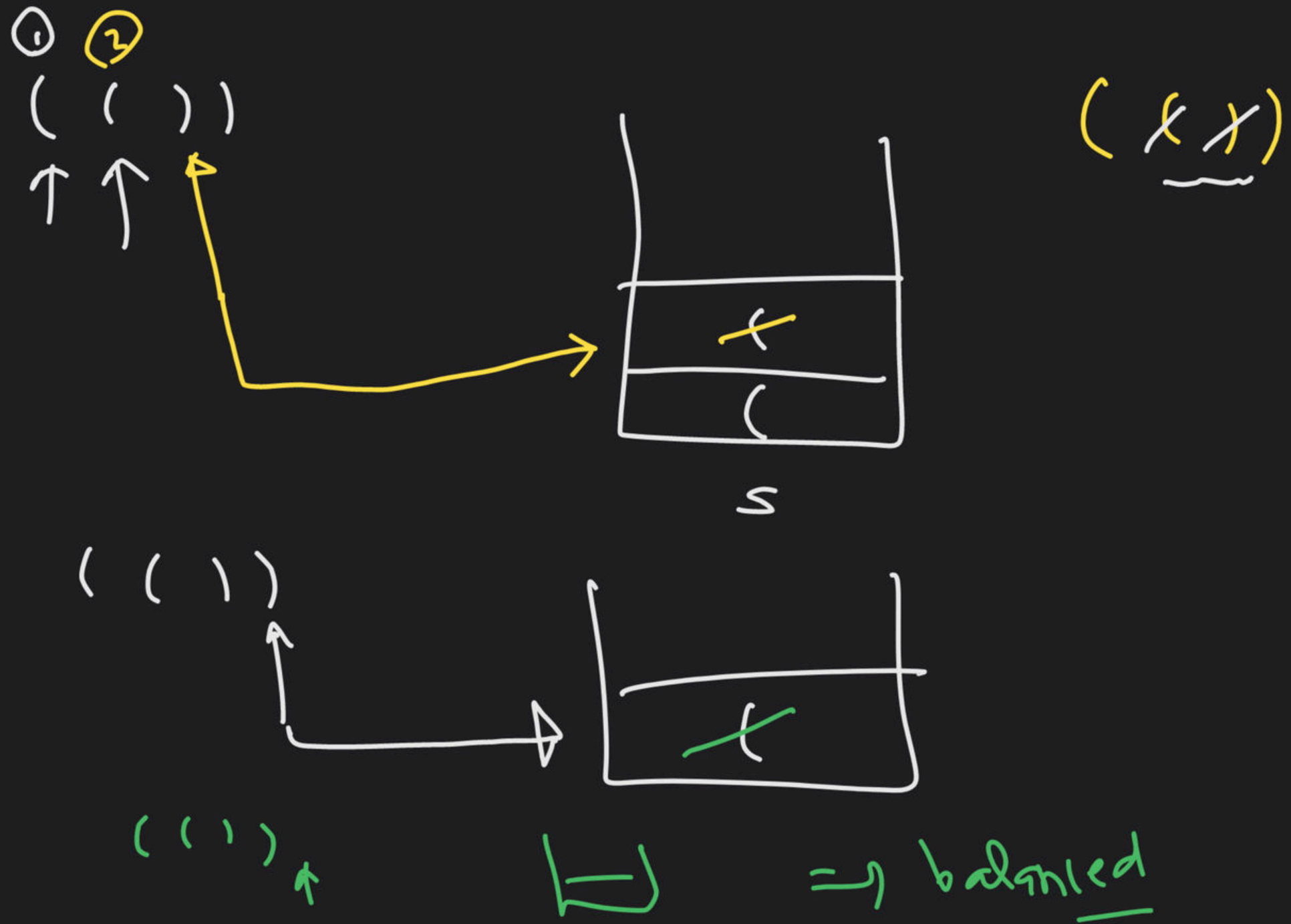
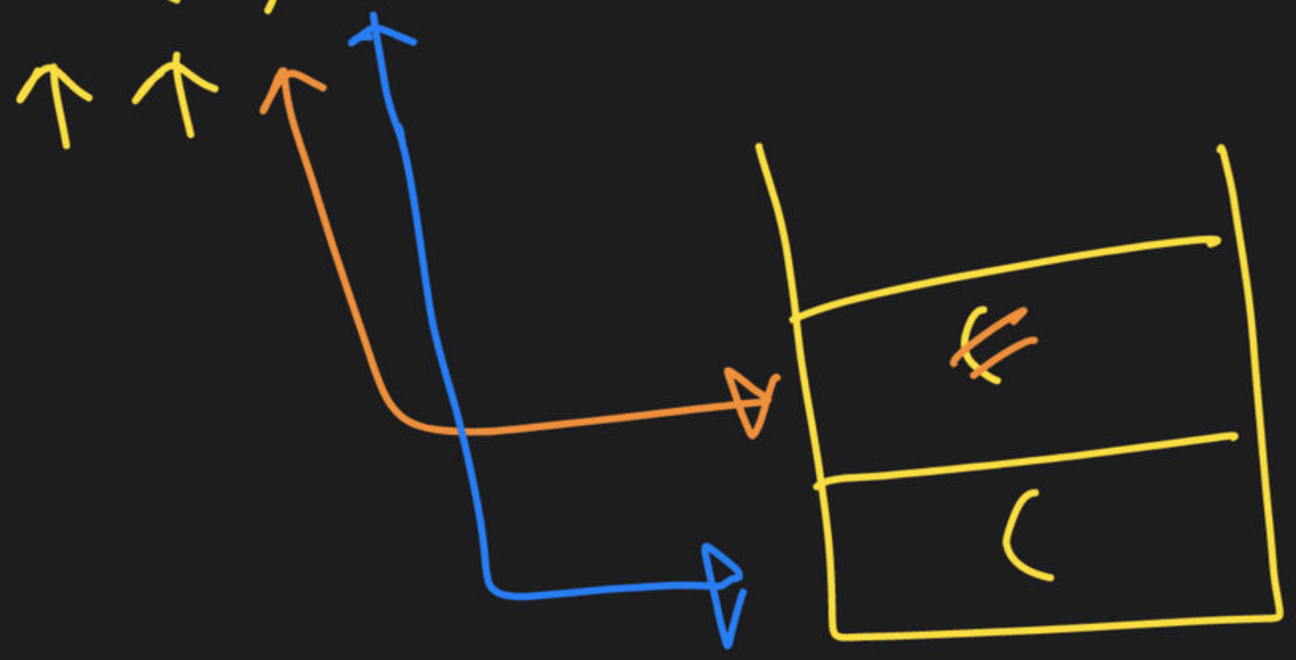
i/p:



i/p : (( ) End



unbalanced

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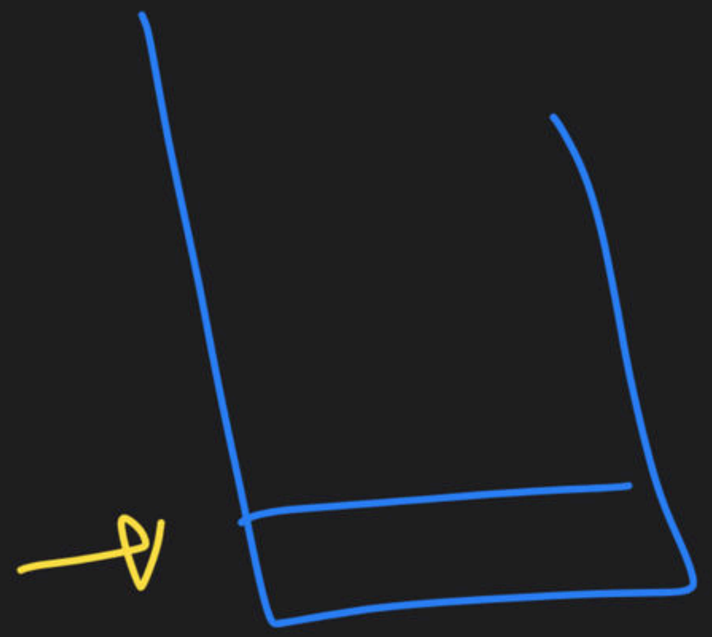
i/p:) ( )

Not balanced



Q. Which of the following is essential to convert an infix exp to postfix exp. efficiently.

A) An operator stack ✓

B) An operand stack

C) An operator & operand stack

D) A Tree

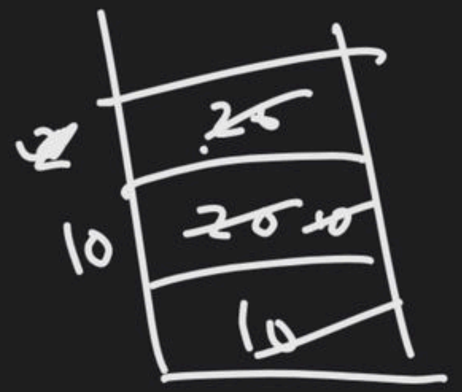
Q. The following seq. of operations is performed on stack: PUSH(10), PUSH(20), POP, PUSH(10), PUSH(20), POP, POP, POP, PUSH(20), POP. The seq. of values popped out is:

A) 20 10 20 10 20

B) 20 20 10 10 20

C) 10 20 20 10 20

D) 20 20 10 20 10



20 20 10

10 20

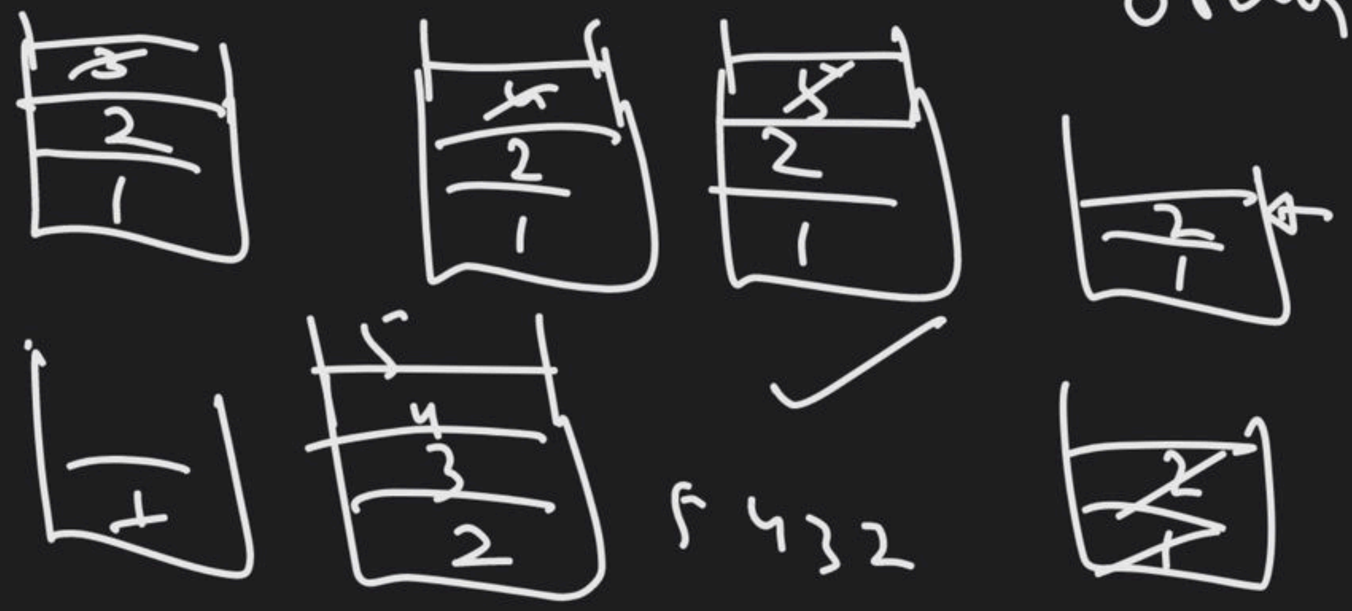
Q) Which of the following permutations can be obtained in the o/p (in the same order) using a stack assuming that the i/p seq. is 1, 2, 3, 4, 5 in that order?

A) 3, 4, 5, 1, 2

B) 3, 4, 5, 2, 1

C) 1, 5, 2, 3, 4

D) 5, 4, 3, 1, 2



A) 3, 4, 5, 1, 2 ✗

B) 3, 4, 5, 2, 1 ✓

C) 1, 5, 2, 3, 4 ✗

D) 5, 4, 3, 1, 2 ✗

20 sec

Q. A prog attempts to generate as many permutations as possible of the string "abcd" by pushing the char. a, b, c, d in the same order onto a stack but it may pop off the TOP char. at any time. Which one of the following strings CANNOT be generated using this prog.

A) abcd ✓

B) dcba ✗

C) cbad ✗

D) cabd ✓

Q) The postfix exp. corresponding to the infix exp:

$a + b \times c - d \wedge e \wedge f$ is :

$abc \times + def \wedge \wedge -$

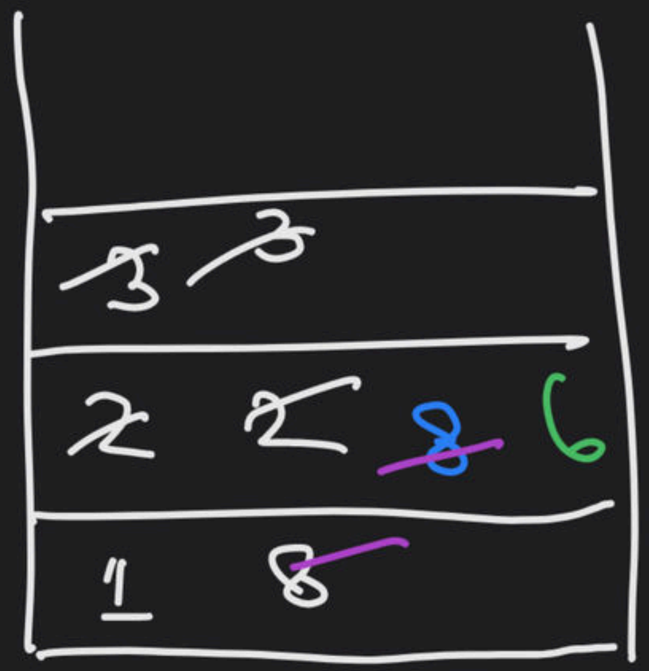
The following postfix exp. with single digit operand is eval. using a stack:

8 2 3 ^ / 2 3 x + 5 1 x -

^: Power. The top 2 elem. of the stack after the first x is eval. are:

A) 6, 1 B) 5, 7 C) 3, 2 D) 1, 5

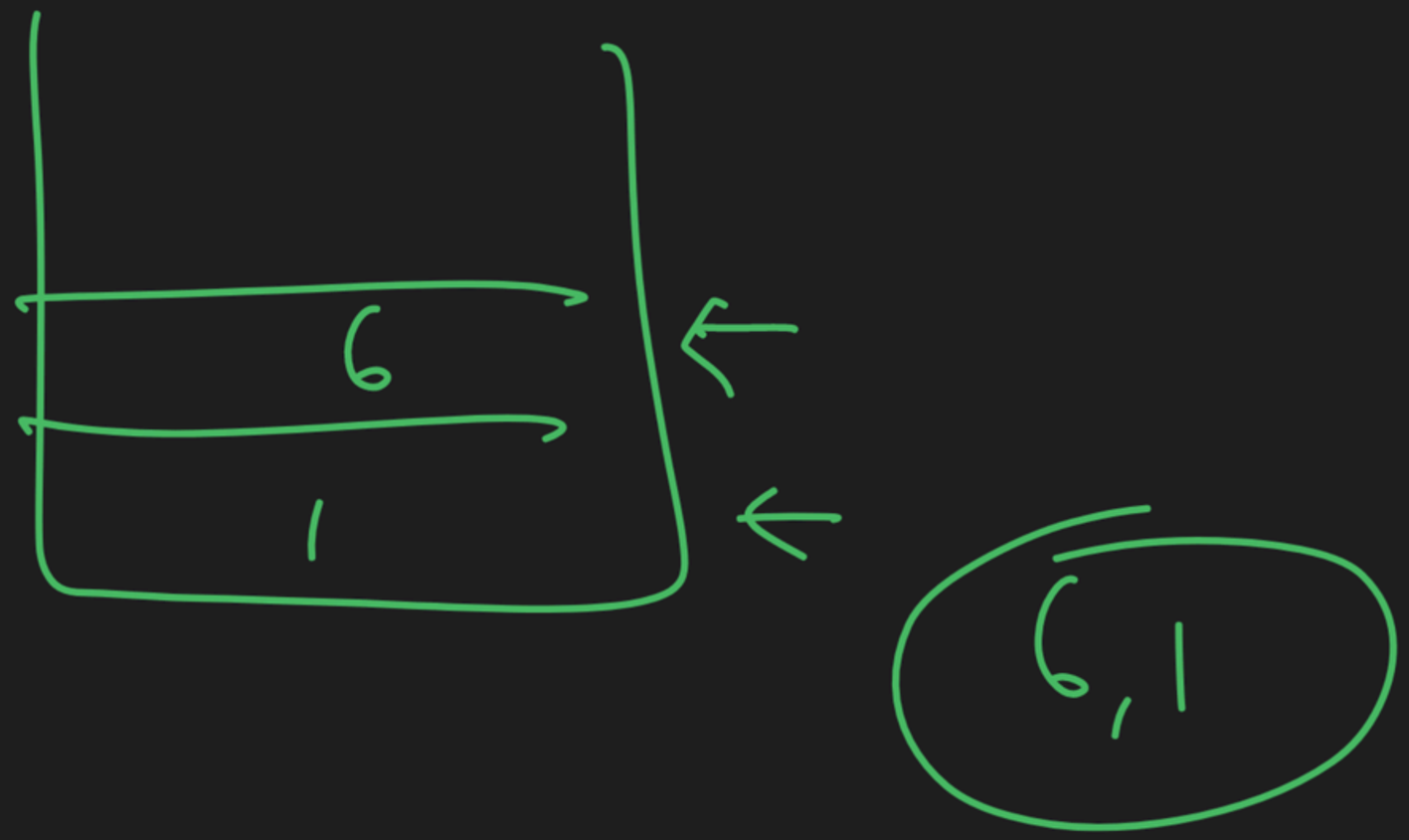
8 2 3 ^ / 2 3 x ~~+ 5 1 x -~~



^ 3, 2 $2 \wedge 3 = 8$

/ 8, 8 $8/8 = 1$

x : 3, 2 $2 \times 3 = 6$



Q. The attributes of three arith. operators in some prog. lang. are given below:

Op.	Precedence	Asso.	Arity
+	High	L to R	Binary
−	Medium	R to L	Binary
×	low	L to R	Binary

The value of the exp: 2 − 5 + 1 − 7 × 3 in this lang is _____

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Hum

Tree

Stack

Queue

Data structure

AIML

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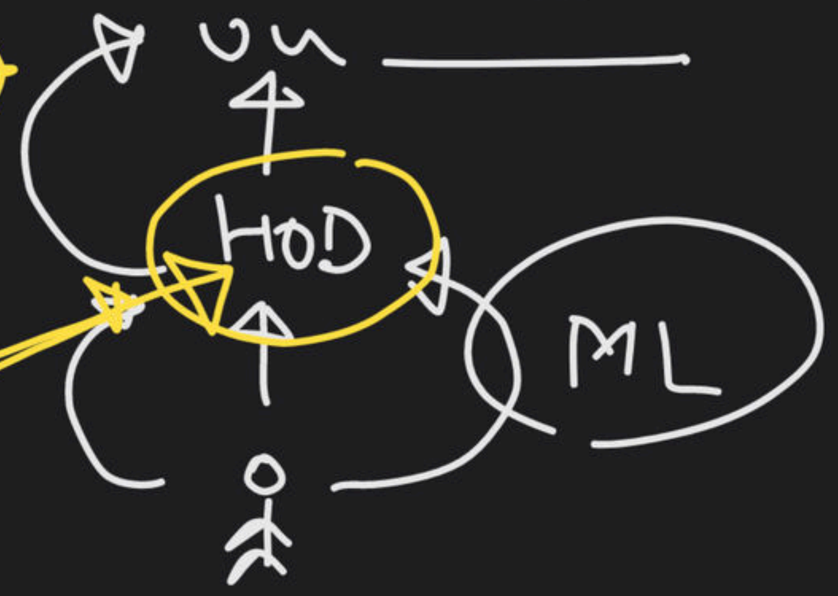
DSAI

Python prog.

and data structure

1 month

Hierarchy



AIML

Course Content

Hum

Java

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Java

Full stack

intern

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5 ⟷ =

→ Elevate batch orientation

→ C
→ DS
→ C++
→ STL
→ Algo
→ Coding C++
→ Python

→ 16 special class

1. DPPs
2. PYQs
3. Atleast 2 Test-series

Fund.

Queue

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THANK YOU!

Here's to a cracking journey ahead!