



# Stack & Queue - Part VII

Course on Data Structure



# CS & IT Engineering

Data Structure  
Stack & Queue



Lecture Number- 20

By- Pankaj Sir





# Topics

*to be covered*

1

Stack & Queue



Test Series  $\rightarrow$  2 subject complete

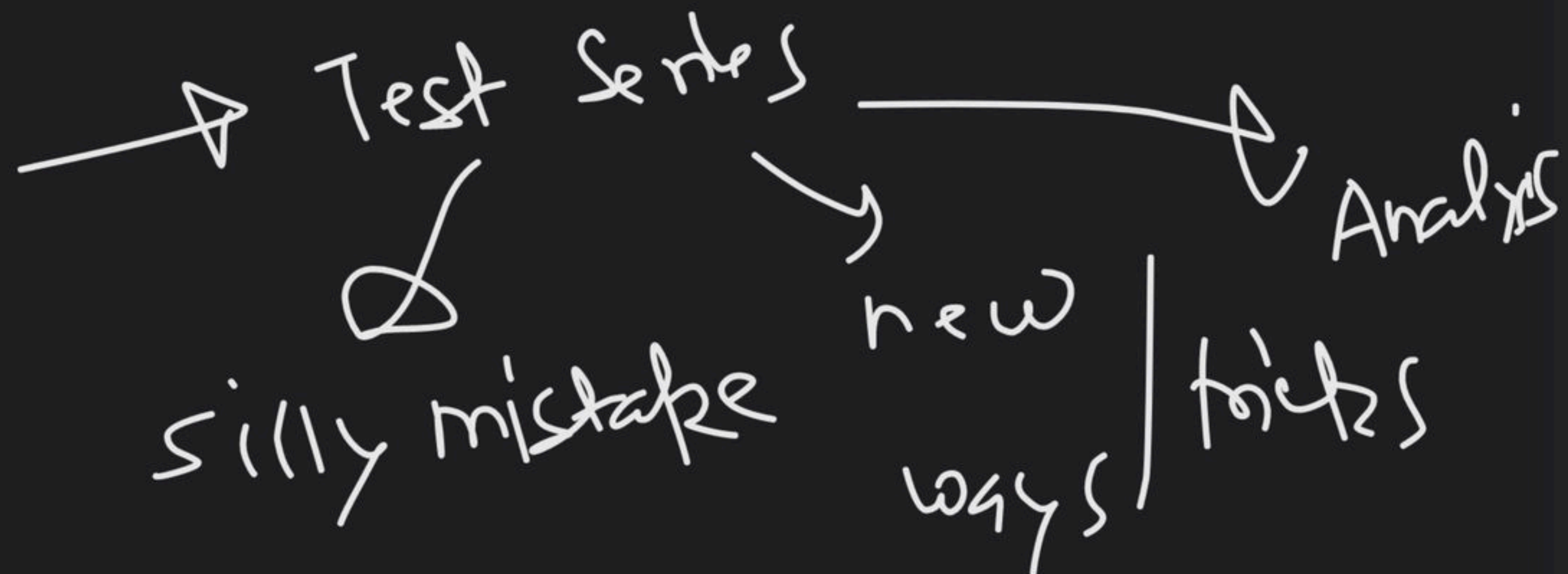
6 subject

Kishan

Maps

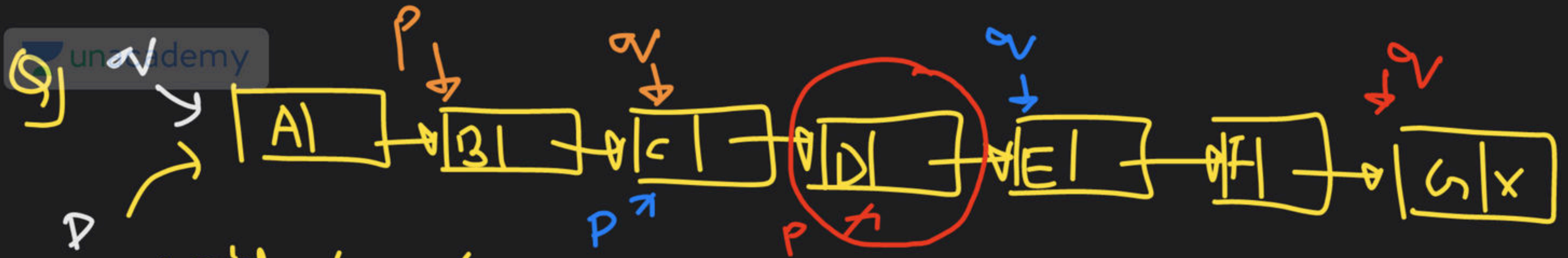


30 Mock



improvement





```
void func (struct node *head) {
```

```
    struct node *p = head, *q = head;
```

```
    while (q != NULL && q->next != NULL && q->next->
```

```
        next != NULL)
```

```
        p = p->next;
```

```
    } q = q->next->next;
```

```
    printf("%d", p->data);
```

```
}
```

D





```
int func(struct node *a) {
```

```
    static int k = 0;
```

```
    struct node *ptr = a;
```

```
    if (!ptr) return 0;
```

```
    else if (ptr->next == NULL) return k + ptr->data;
```

```
    else {
```

```
        k + ptr->data;
```

```
        func(ptr->next);
```

```
    } return k;
```



1 → 2 → 3 → 4 → 5

```
void func(struct node *p) {
    int temp;
    struct node *q = p → next;
    if (!p || !(p → next)) return;
```

```
else {
```

```
    temp = q → data;
```

```
    q → data = p → data;
```

```
    p → data = temp;
```

```
    func(p → next → next);
}
```

a) 2 3 4 5 1

b) 5 4 3 2 1

c) 2 1 4 3 5

d) 2, 4 5 3

Q) Consider the following seq. of operation on an empty stack:

Push(5);

Push(2);

Pop();

Push(4);

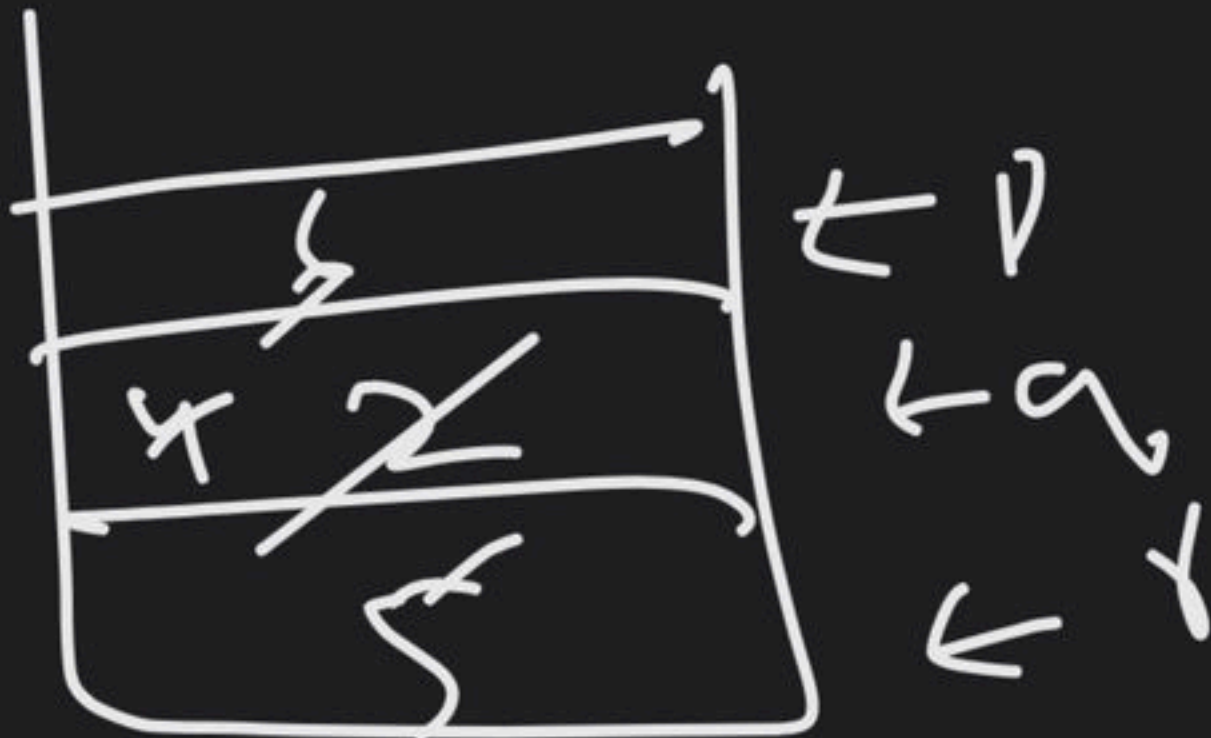
Push(6);

P = Pop();

q = Pop();

r = Pop();

The value of  $P + q + r$  is \_\_\_\_\_



$$1 + 4 + 5 = 10$$



2.) which of the following is not an application of stack.

~~A)~~ Recursive function calls

~~B)~~ HTML Tag matching

~~C)~~ Checking if an exp. contains balanced parenthesis

☒ D) None of these



Q Which one of the following <sup>(M5Q)</sup> permutations  
can not be obtained in the o/p string using  
a stack  $\Delta$  assuming that the i/p  
seq. is a, b, c, d, e in the same order.

☒ A) c d e a b ✓

☒ B) a e b c d ✓

☐ C) c d e b a

☐ D) e d c b a

e a c b

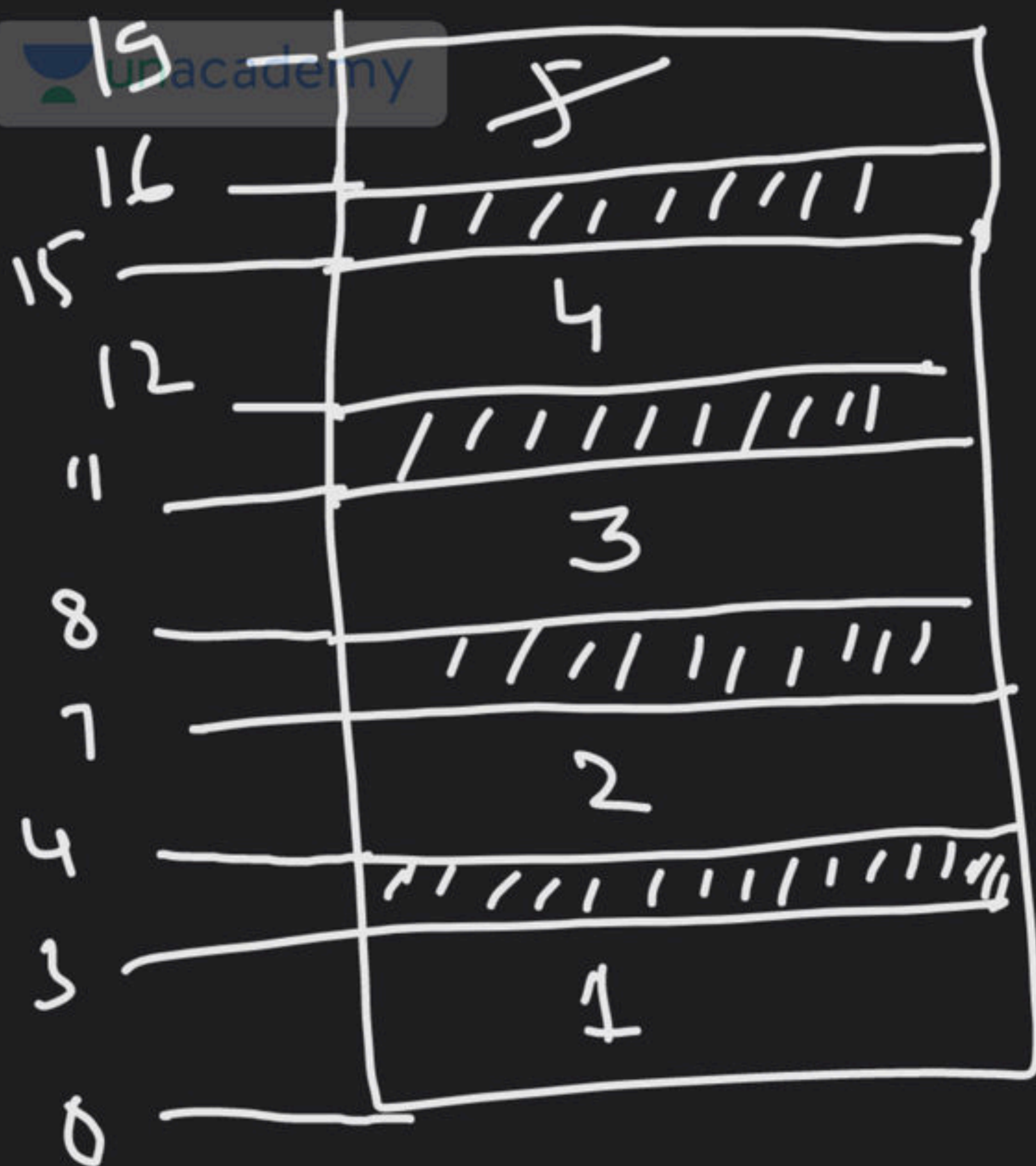
NO



Q) Let  $S$  be a stack of size  $n \geq 1$ . Starting with the empty stack, suppose we push first  $S$  natural numbers in seq. order then perform 5 pop operations. Assume that push and pop operations take 3 secs each and 1 sec elapse b/w the end of one such stack op. and start of next op. The average stack life of an element of this stack is \_\_\_\_\_

h.w





Pop(5)  $\rightarrow$  15+1  
 $=$  (26)

	Push	st	Push end	Pop st	Pop end
1	0		3	36	39
2	4		7	32	35
3	8		11	28	31
4	12		15	24	27
5	16		19	20	23

$(1 + 9 + 17 + 25 + 33) / 5 = (17) \checkmark$



Q/  $P - Q / (R \times S) + T \times U$

The prefix is:

- ~~A)  $- + P / Q \times R S \times T U$~~
- B)  $+ - P / Q \times R S \times T U$
- C)  $+ - P Q \times R S \times T U$
- D) None

$\ominus$  + last operation  
→

$$P - Q / [ \times R S ] + T \times U$$

$$P - [ / Q \times R S ] + T \times U$$

$$P - [ / Q \times R S ] + [ \times T U ]$$

$$[ - P / Q \times R S ] + [ \times T U ]$$

$$P + Q/R - S \times T \wedge U/V - W$$

Postfix is ?

$$P + Q/R - S^{\circ} \times [T \wedge U] / V - W$$

$$P + [Q/R] - [S \times T \wedge U] / V - W$$

$$P + [Q/R] - [S \times T \wedge U \times V] - W$$

$$[P \times Q/R] - [S \times T \wedge U \times V] - W$$

$$[P \times Q/R + S \times T \wedge U \times V] - W \Rightarrow P \times Q/R + S \times T \wedge U \times V / - W -$$



Q / Consider the infix exp:

$$P \times Q / R - S * T + U / V * W$$

On reaching symbol  $V$ , the top 2 element of the operator stack (while converting into postfix) are:



$$P \times Q / R - S * T + U / V * W$$

~ / p:

$$P Q \times R / S T^x - U$$

↑



e moji

/ +

Q / Postfix Expression:

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

The result of Eval. the above postfix exp. is

---

$$8 \text{ (2 3)}^1 / 5 \text{ 3} \times + 2 / 3 -$$

$$(8 \text{ 8} /) 5 \text{ 3} \times + 2 / 3 -$$

$$1 \text{ (5 3} \times) + 2 / 3 -$$

$$(1 \text{ 15} +) 2 / 3 -$$

$$(16 \text{ 2} /) 3 -$$

$$(5) \text{ (8 3} -)$$



Q) Let  $X$  be the result when the following postfix is eval:

$$X = 8 \ 3 \ 1 \ + \ - \ 2 \ ^ \ 7 \ 1 \ 2 \ - \ * \ +$$

And  $Y$  be the result of following postfix

$$Y = X \ 3 \ 1 \ 4 \ +$$

what is  $(X+Y)$  ?

$$Y = X \cdot 3/4 +$$

$$X + Y$$

$$Y = 93/4 +$$

$$34 +$$

$$= 16$$

$$X = 9$$

$$Y = 7$$



Q Consider a singly L.L. of  $n$  elements, then the time to interchange with  $l^{\text{th}}$  element is:

$$\max(m, l)$$

Q - To apply binary search which of the following data structure is/are suitable.

A) SLL

B) DLL

C) Array

D) CLL



Q

10	20	30	40	50	60	70	80	90
----	----	----	----	----	----	----	----	----

[illegible]

24

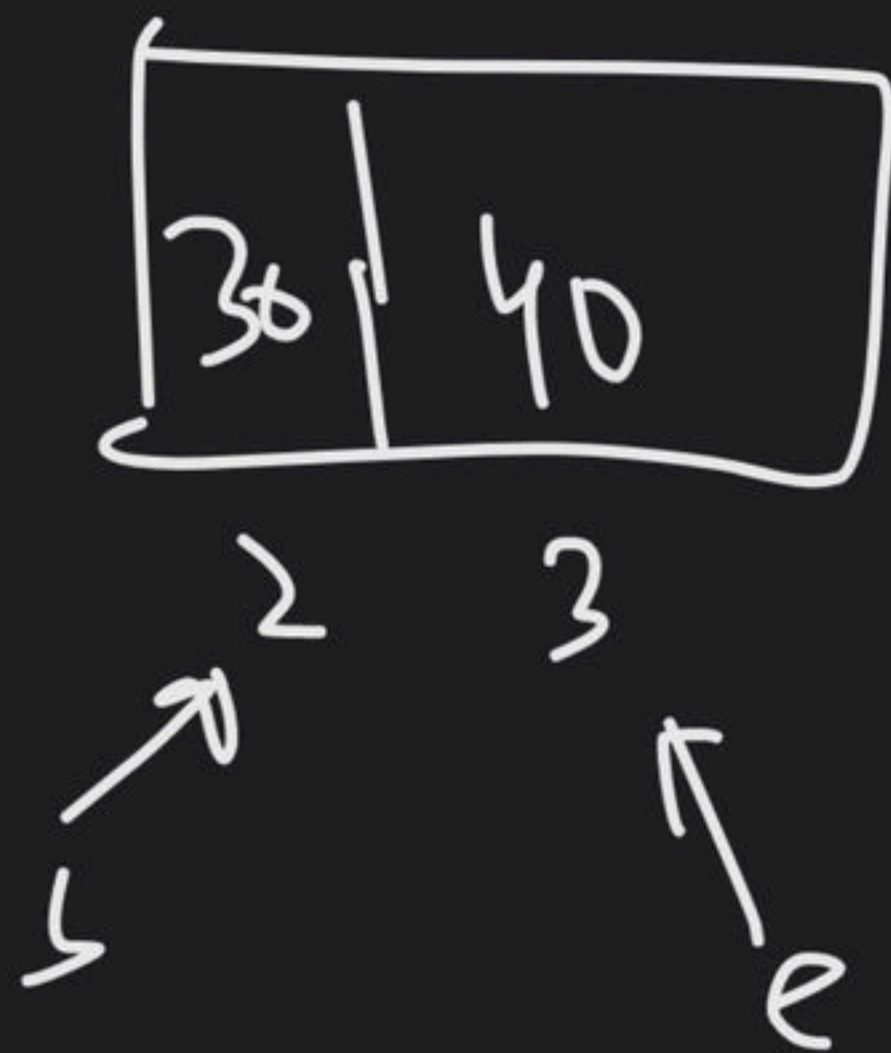
$$\text{mid} = \cancel{0} + 8/2$$
$$= 4$$



10	20	30	40
----	----	----	----

Handwritten diagram showing a sequence of numbers 0, 1, 2, 3. Below the numbers, there are arrows pointing to them. The arrow pointing to 1 is labeled 'mid', and the arrow pointing to 3 is labeled 'e'.

$$m_{12} = \frac{1+3}{2} = 1$$





Q An  $n \times n$  array  $v$  is defined as follows:


$$v[i, j] = i - j \text{ for all } i, j$$

$$1 \leq i \leq n$$

$$1 \leq j \leq n$$

The sum of elements  
of the array  $v$  is —

$$v_{11} = \underline{\underline{1 - 1 = 0}}$$

- ① Arrays
  - ② Linked list
  - ③ stack
  - ④ Queue → ①
  - ⑤ Trees → 8-9
  - ⑥ Graphs representation
- 

⑦ Hashing - 21

15 Lec



$$X = 8(31+) - 2^7 12 - * +$$

$$84 -$$

$$42 \uparrow$$

$$7 1 2 - * +$$

$$X = 9$$

$$16 7 (12 -) * +$$

$$16 (7 - 1 +) +$$

$$16 - 7 + \Rightarrow 9$$

▲ 2 • Asked by Subhadeep

Sir mai abhi second year mai hu mera sirf c programming hua hai aur data structure apse kar raha hu to mai kab se test dena start kar sakta hu ?? 2026 aspirnt





# THANK YOU!

Here's to a cracking journey ahead!