DSA → Jobar stp

21.11.24

Linked list (C10)

(next)
- doubly Linked list
- circular Linked list
- singly Linked list

(global declaration)

```
struct node{
    char data;
    struct node *next_data;
}
struct node *head;
```

Pseudo code

- Insert( )
- Insert at the ~~end~~ beginning
- ~~Insert~~ at the end
- delete from start, end, any index
- display

```
main(){
    int n,i;
    scan n;
    p=(char*)calloc(n, sizeof(struct node));
    head = &P[0];
    for (0 to n){
        scan (data, P[i].data);
        P[i].next_data = &P[i+1];
```

#Array traversal

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}_{3\times 2} \quad B = \begin{bmatrix} 7 & 8 & 9 \\ 10 & 11 & 12 \end{bmatrix}_{2\times 3}$$

$$AB = \begin{bmatrix} 7+20 & 8+22 & 9+24 \\ 21+40 & 24+44 & 27+48 \\ 35+60 & 40+66 & 45+72 \end{bmatrix}$$

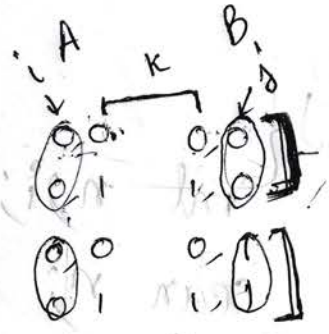
$$= \begin{bmatrix} 27 & 30 & 33 \\ 61 & 68 & 75 \\ 95 & 106 & 117 \end{bmatrix}$$

0,0	0,1	0,2
1,0	1,1	12
20	21	22

- scanf("%d %d %d", &Ar, &Ac, &Bc); → variable for Mat dimension
- mat [r][c]
  - r: row, c: column

```
for (i=0; i<Ar; i++)
    for (j=0; j<Bc; j++)
        for (k=0; k<Ac; k++)
```

i, j, k



res = 0,0 = 27

2,0 0,6
2,1 0,1

temp = 0 0
27

0,0 0,2
0 1 1,2

1,0 0,0
1,1 1,0

1,0 0,1
1,1 1,1

1,0 0,2
1,1 1,2

DSA syllabus from Jabir sir

#stack, queue

#dynamic memory allocation using malloc, calloc, realloc free → vector for cpp

#bubble sort, selection sort, insertion sort

#Linked List

#recursion

#merge sort, quick sort

#graph theorem

#floyd warshell

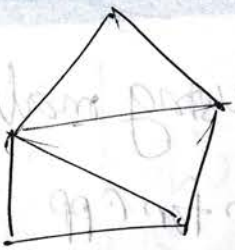
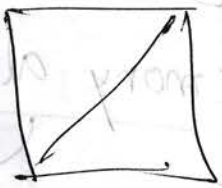
#heap sort (binary tree)

#topological sort

#BFS, DFS

#trie

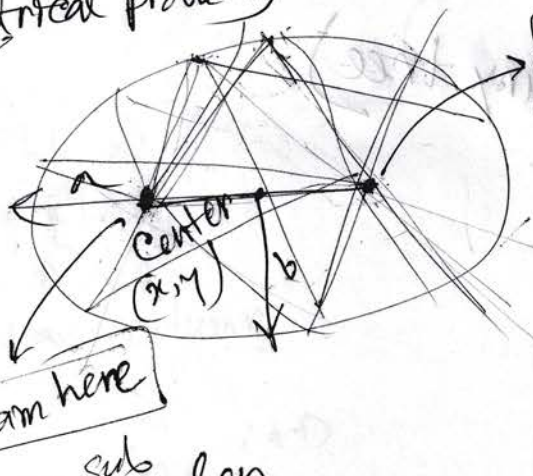
If, and,

Q.  

find the logic for how many triangles can be drawn inside with intersecting the connecting lines from verteces? $\Rightarrow (n-2) \rightarrow$ print

- complex number / imaginary dimension?

Q. (geometrical problem)

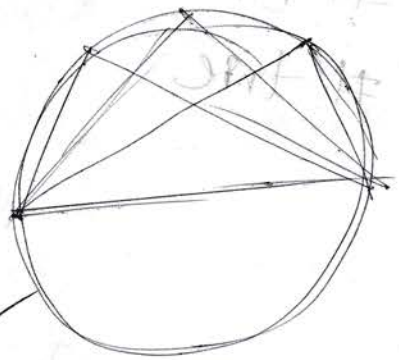


- a point in an oval shape
- centers of oval

radius and 1 sub center given

a, b

(x, y) ← an



out → (x, y)

~~math.h~~

~~2D array~~

math formula

angle sum constant

A[5] = { } for(int i=0; i<5; i++){

printf("A[%d] = %d", i, A[i]); <<endl

cout << "A[" << i << "] =" << A[i];

}

C →

Sadab bhai

fast input output alternative for competitive programming ?

<bits/stdc++.h>

Asymptotic notation ?

52-batch →

scanf/printf recommended instead of cin/cout for fast In/out

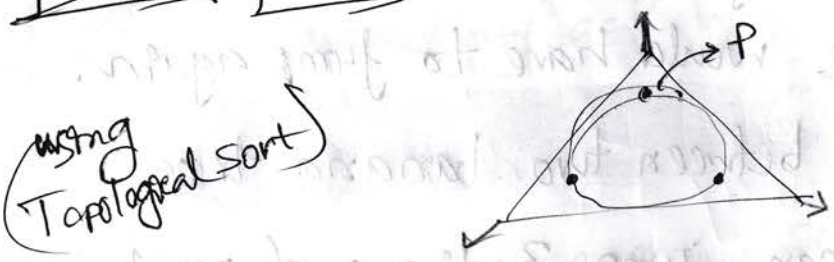
#include <bits/stdc++.h>

→ including STL

endl is slower than "\n"

Math DSA → Jobar Stn

04-12-24



(using Topological sort)

a dog standing on each verteces of the triangle
a chicken " points " circle

two animal types start running at same speed.
how many cycles? they would meet in the triangle-circle intersection after

[Canadian National Programming Association] → Book (?)

- Real life application of DSA
- CICA manual → site

https://www.unb.ca/cic

https://www.unb.ca/cic/datasets

must use tor network
to avoid data breach
(hosted under onion network ?)

Q. A monkey can jump from one apple tree to another but he would have to jump again. He can also jump between two banana trees but in this way he can jump 3 times at most. Find a way where he jumps between the trees for the same amount.

1. Multidimensional array
2. Structure, pointer, dynamic memory allocation
3. Selection sort, linear binary search, insertion sort, bubble sort, merge sort, quick sort
4. stack, queue, linked lists.
5. graph, construction
6. Floyd Warshell, BFS, DFS
7. Heapsort and heapify + topological sort
8. Recurtion

graphs in DM and DSA https://www.geeksforgeeks.org/graph-data-structure-and-algorithms/

Quiz
1. Soctrative (100 Problems 100 minutes)
--> 5 options
2. Printed (50 problems 70 minutes)
--> 7 options
3. printed (20 problems 10 minutes)
--> 8 options