22/5/24

Topology Sort Algorithm

+ Using DFS:-

```
#include <stdio.h>
#include <stdlib.h>

#define MAX_Vertices 100

int s[MAX_Vertices] = {0};
int res[MAX_Vertices];
int j = 0;

void DFS(int u, int a[MAX_Vertices][MAX_
vertices])
{
  s[v] = 1;

  for(int v = 0; v<n; v++) {
    if (a[u][v] == 1 && s[v] == 0)
    {
      DFS(v, n, a);
    }
  }
  res[j++] = u;
}

int main()
{
  int n;
  printf("Enter the no of vertices:");
```

```
    scanf("%d", &n);

    int a[MAX_VERTICES][MAX_VERTICES];
    printf("Enter the adjacent matrix\n");
    for(int i=0; i<n; i++)
    {
        for(int j=0; j<n; j++)
        {
            scanf("%d", &a[i][j]);
        }
    }
    for(int u=0; u<n; u++){
        if (s[u]==0) {
            DFS(u, n, a);
        }
    }
    for(int u=0; u<n; u++)
    {
        if(s[u]==0){
            DFS(&u, n, a);
        }
    }
    printf("Topological order:");
    for(int j=j-1; i>=0; j--){
        printf("%d", res[i]);
    }
    printf("\n");
    return 0;
}
```

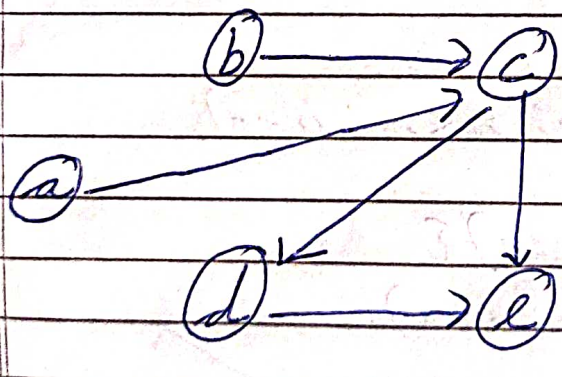
Output :-

Enter the no of vertices : 5

Enter the adjacency matrix :

0 0 1 0 0
0 0 1 0 0
0 0 0 1 1
0 0 0 0 1
0 0 0 0 0

Topological order (0 2 3 4)



DATE: / /
PAGE NO: Usha Gold

+ Source Removal Method

```
#include <stdio.h>
#include <stdlib.h>

int st[100];
int top = -1;

void degree (int adj [] [20], int n) {
  int indegree [20];
  int sum=0;
  for (int j = 0; j<n; j++) {
    sum = 0;
    for (int i = 0; i<n; i++)
    {
      sum = sum + adj [i] [j];
    }
    indegree [j] == 0) {
      top++;
      st [top] = i;
    }
}
while (top != -1) {
  int u = st [top];
  top--;
  printf ("%d", u);
  for (int v=0; v<n; v++) {
    if (adj [u] [v] == 1) {
      indegree [v]--;
      t/o++;
      st [top] = v;
    }
```

```
    }
}
}

int main()
{
    int n;
    printf("Enter the no of nodes:");
    scanf("%d",&n);

    int adj[20][20];

    printf("Enter the adjacency matrix:\n");
    for(int i=0;i<n;i++){
        for(j=0;j<n;j++)
        {
            scanf("%d",&adj[i][j]);
        }
    }
```

Output :-

Enter the no of vertices :7

Enter the adjacency matrix :

0 1 0 0 0 0

0 0 0 0 1 0 1

0 0 0 0 0 1 0

1 1 1 0 0 1 1

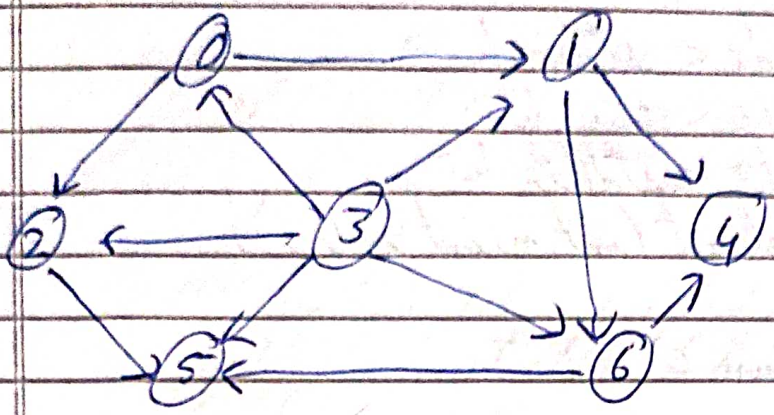
0 0 0 0 0 0 0

0 0 0 0 0 0 0

0 0 0 0 1 1 0

DATE: / /
PAGE NO. Usha Gold

Topology order : 3 0 2 1 6 5 4



29/5/24