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ADA LAB-TEST 1

Topological Sorting (Using DFS)

```
#include <stdio.h>
#include <stdlib.h>
int a[10][10], n, indegree[10];
void find_indegree()
{
  int j, i, sum;
  for(j=0; j<n; j++)
  {
    sum = 0;
    for(i=0; i<n; i++)
    sum += a[i][j];
    indegree[j] = sum;
  }
}

void topology()
{
int i, u, v, t[10], s[10], top=-1, k=0;
find_indegree();
```


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```
for(i=0; i<n; i++)
{
  if (indegree [i] == 0)
    s [++top ]= i ;
}
while (top != -1)
{
  u = s[top--];
  t [k++] = u;
  for(v=0; v< n; v++)
{
   if (a [u] [v] == 1)
   {
     indegree [v] --;
   if (indegree[v] == 0)
    s [++ top]= v ;
  }
  }
  }
printf ("The topological sequence is: \n");
  for (i=0; i <n; i++)
   printf (" %d", (t[i]+1));
}
```


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```
void main()
{
  int i, j;
  printf("Enter number of vertices:");
  scanf("%d", &n);
  printf("\n Enter the adjacency matrix:\n");
  for (i=0; j<n; i++)
  {
   for (j=0; j<n; j++)
    scanf("%d", &a[i][j]);
   }
    topology();
}
```

Modification (source removal)

→

```
# include <stdio.h>
int temp[10], k=0;
void topo(int n, int indegree[10], int a[10][10])
{
  int i, j;
 for( int i=1 ; i<=n; i++)
  {
```


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```
if (indegree [i] == 0)
{
 indegree [i] = 1;
 temp [++k] = i;
 for (j=1; j<=n; j++)
{
  if (a[i][j] == 1 && indegree [j] != -1)
  {
   indegree [j] = -1;
  }
  i = 0;
}
}
}

int main()
{
int i, j, n, indegree [10], a[10][10];
printf (" Enter the number of vertices : ");
scanf (" %d", &n);
for (i=1; i<=n; i++)
 indegree [i] = 0;
printf (" \n Enter the adjacency matrix \n");
for (i=1; i<=n; i++)
 for (j=1; j<=n; j++)
 {
```


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```
scanf ("%d", &a[i][j]);
if (a[i][j]==1)
indegree[j]++;
}
topo (n, indegree, a);
if (k!=n)
printf ("topological ordering is not possible \n");
else
{
printf ("\n topological ordering is not possible\n");
else
{
printf ("\n topological ordering is :\n");
for (i=1; i<=k; i++)
printf ("v%d\t", temp[i]);
}
}
```


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