// Program to Represent A Sparse Matrix in a tabular form - Visakh Bobby - 43 - S3R2

#include<stdio.h>

void sparse(int a[10][10],int m,int n)

{

int i,j;

int s[10][10];

int k=1; //used to detemine the number of rows that's supposed to be there

// 1 st row of sparse matrix is supposed to give the number of (rows , columns and values).

s[0][0] = m; //no of rows

s[0][1] = n; //no of columns

for(i=0;i<m;i++)

{

for(j=0;j<n;j++)

{

if(a[i][j] != 0)

  {

s[k][0] = i;

   s[k][1] = j;

s[k][2] = a[i][j];

   k++;

  }

}

}

k=k-1; //no of values : it starts at k=1 , that's why , we have to subtract 1.

s[0][2] = k; //no of values assigned to 1st row ,3rd col element

//printing the sparse matrix

printf("The Sparse Matrix is Represented as follows\n");

printf("Row\tCol\tVal\n");

for(i=0;i<=k;i++)

    {

     for(j=0;j<3;j++) //no of columns in a sparse matrix representation is 3.

      {

        printf("%d\t",s[i][j]);

      }

    printf("\n");

    }

}

void main()

{

  int a[10][10];

  int m,n,i,j;

  printf("Enter the maximum no of rows & columns\n");

  scanf("%d%d",&m,&n);

  printf("Enter the 2D array:");

  for(i=0;i<m;i++)

  {

    for(j=0;j<n;j++)

    {

    printf(" Element [%d][%d]: ",i,j);

    scanf("%d",&a[i][j]);

   }

  }

  sparse(a,m,n);

}

**Output:**

