Sparse matrix read and convert a original matrix into sparse matrix

```
#include<stdio.h>
#include<stdlib.h>
#define MAX 10
int main(){
  int row,col,i,j,a[10][10],count=0,cnt=0,sparse[MAX][3];
  printf("Enter row\n");
  scanf("%d",&row);
  printf("Enter Column\n");
  scanf("%d",&col);
  printf("Enter Element of Matrix1\n");
  for(i = 0; i < row; i++){
    for(j = 0; j < col; j++){
      scanf("%d",&a[i][j]);
    }
  }
    printf("Elements are:\n");
  for(i = 0; i < row; i++){
    for(j = 0; j < col; j++){
      printf("%d\t",a[i][j]);
    }
    printf("\n");
  }

  /*checking sparse of matrix*/
  for(i = 0; i < row; i++){
    for(j = 0; j < col; j++){
      if(a[i][j] == 0)
        count++;
    }
  }
  if(count > ((row * col)/2))
    printf("Matrix is a sparse matrix \n");
  else
    printf("Matrix is not sparse matrix\n");


   for (i = 0; i < row; i++){
```

```
    for (j = 0; j < col; j++){
        if(a[i][j]!=0)
        {
            sparse[cnt][0]=i;
            sparse[cnt][1]=j;
            sparse[cnt][2]=a[i][j];
            cnt++;
        }
    }
}
for(i = 0; i < cnt; i++){
   printf("%d\t%d\t%d\t",sparse[i][0],sparse[i][1],sparse[i][2]);
}

}
```

Sparse matrix addition and transpose

```
#include<stdio.h>
#define MAX 20
void printsparse(int[][3]);
void readsparse(int[][3]);
void transpose(int[][3],int[][3]);

int main()
{
int b1[MAX][3],b2[MAX][3],m,n;
printf("Enter the size of matrix (rows,columns):");
scanf("%d%d",&m,&n);
b1[0][0]=m;
b1[0][1]=n;
readsparse(b1);
transpose(b1,b2);
printsparse(b2);
}

void readsparse(int b[MAX][3])
{
int i,t;
printf("\nEnter no. of non-zero elements:");
scanf("%d",&t);
b[0][2]=t;
for(i=1;i<=t;i++)
```

```
{
printf("\nEnter the next triple(row,column,value):");
scanf("%d%d%d",&b[i][0],&b[i][1],&b[i][2]);
}
}

void printsparse(int b[MAX][3])
{
int i,n;
n=b[0][2]; //no of 3-triples
printf("\nAfter Transpose:\n");
printf("\nrow\t\tcolumn\t\tvalue\n");
for(i=0;i<=n;i++)
printf("%d\t\t%d\t\t%d\n",b[i][0],b[i][1],b[i][2]);
}

void transpose(int b1[][3],int b2[][3])
{
int i,j,k,n;
b2[0][0]=b1[0][1];
b2[0][1]=b1[0][0];
b2[0][2]=b1[0][2];
k=1;
n=b1[0][2];
for(i=0;i<b1[0][1];i++)
for(j=1;j<=n;j++)
//if a column number of current triple==i then insert the current triple in b2
if(i==b1[j][1])
{
b2[k][0]=i;
b2[k][1]=b1[j][0];
b2[k][2]=b1[j][2];
k++;
}
}
```