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//Created by Ritwik on 17th March 2021
//183215
//Sparse Matrix Implementation Using Linked List


#include<stdio.h>
#include<stdlib.h>
struct sparsematrix_node {
    int data;
    int row_value;
    int col_value;
    struct sparsematrix_node * next;
};
typedef struct sparsematrix_node* SPMNODE;
SPMNODE start = NULL;
SPMNODE createNode (int val, int row, int col) {
    SPMNODE temp = (SPMNODE)malloc(sizeof(struct sparsematrix_node));
    temp->data = val;
    temp->row_value = row;
    temp->col_value = col;
    temp->next = NULL;
    return temp;
}
void addNode(int val, int row, int col) {
    SPMNODE node;node = createNode(val,row,col);
    SPMNODE temp=start;
    if(temp==NULL){start=node;}else{
        while(temp->next!=NULL){
            temp=temp->next;}
        temp->next=node;}
}

void displaySparseMatrix() {
    SPMNODE temp=start;
    printf("Row\tColumn\tValue\n");
    while(temp!=NULL){printf("%3d\t",temp->row_value);
        printf("%6d\t",temp->col_value);
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        printf("%5d\n",temp->data);temp=temp->next;}
}
int main() {int rows,cols,i,j;
    int sparse_matrix[10][10];
    printf("Enter the row & column sizes of the sparse matrix : ");
    scanf("%d %d", &rows, &cols);
    for (i = 0; i < rows; i++) {
        for (j = 0; j < cols; j++){
            printf("Enter the value of sparse_matrix[%d][%d] : ",i,j);
            scanf("%d", &sparse_matrix[i][j]);}
    }
    for (i = 0; i < rows; i++) {for (j = 0; j < cols; j++){
        if(sparse_matrix[i][j]!=0)addNode(sparse_matrix[i][j],i,j);

    }

    }
    displaySparseMatrix();}
```