DSA ASSIGNMENT - 3

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Sparse matrix:

*#include*<stdio.h>

*#include*<stdlib.h>

*struct* mat {

*int* *col*;

*int* *row*;

*int* *ele*;

*struct* mat*\** *next*;

};

*void* *insert*(*struct* mat*\*\** head) {

*int* *c*, *r*, *x*;

*printf*("ENTER ROW AND COLUMN NUMBER OF NON ZERO ELEMENTS");

*scanf*("%d", *&r*);

*scanf*("%d", *&c*);

*printf*("ENTER THE VALUE OF THE ELEMENT");

*scanf*("%d", *&x*);

*struct* mat*\** *newnode* *=* (*struct* mat*\**)*malloc*(*sizeof*(struct mat));

*struct* mat*\** *temp* *=* *\**head;

*newnode*->*col* *=* *c*;

*newnode*->*row* *=* *r*;

*newnode*->*ele* *=* *x*;

*newnode*->*next* *=* *NULL*;

*if* (*\**head *==* *NULL*) {

*\**head *=* *newnode*;

    } *else* {

*while* (*temp*->*next* *!=* *NULL*) {

*temp* *=* *temp*->*next*;

        }

*temp*->*next* *=* *newnode*;

    }

}

*void* *print*(*struct* mat*\** head, *int* n, *int* m) {

*struct* mat*\** *temp* *=* head;

*int* *i*, *j*;

*printf*("ROW ");

*printf*("COLUMN ");

*printf*("ELEMENT ");

*printf*("\n");

*for* (*i* *=* 1; *i* *<=* n; *i++*) {

*for* (*j* *=* 1; *j* *<=* m; *j++*) {

*if* (*temp* *!=* *NULL* *&&* *temp*->*row* *==* *i* *&&* *temp*->*col* *==* *j*) {

*printf*(" %d ", *temp*->*row*);

*printf*("    %d ", *temp*->*col*);

*printf*("    %d ", *temp*->*ele*);

*printf*("\n");

*temp* *=* *temp*->*next*;

            }

        }

    }

}

*int* *main*() {

*int* *n*, *m*;

*printf*("ENTER NUMBER OF ROWS AND COLUMNS IN THE MATRIX : ");

*scanf*("%d %d", *&n*, *&m*);

*struct* mat*\** *head* *=* *NULL*;

*printf*("ENTER NUMBER OF NON ZERO ELEMENTS : ");

*int* *t*, *i*;

*scanf*("%d", *&t*);

*for* (*i* *=* 0; *i* *<* *t*; *i++*) {

*insert*(*&head*);

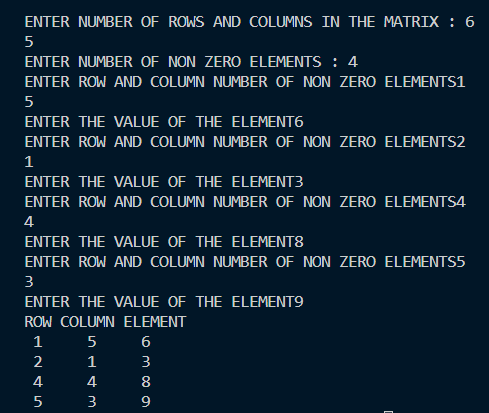
    }

*print*(*head*, *n*, *m*);

*return* 0;

}

OUTPUT:



2. C program to add 2 long integers which are represented using linked list

*#include* <stdio.h>

*#include* <stdlib.h>

*struct* Node

{

*int* *data*;

*struct* Node *\*next*;

};

*struct* Node *\*createNode*(*int* value)

{

*struct* Node *\*newNode* *=* (*struct* Node *\**)*malloc*(*sizeof*(struct Node));

*newNode*->*data* *=* value;

*newNode*->*next* *=* *NULL*;

*return* *newNode*;

}

*void* *appendNode*(*struct* Node *\*\**head, *int* value)

{

*struct* Node *\*newNode* *=* *createNode*(value);

*if* (*\**head *==* *NULL*)

    {

*\**head *=* *newNode*;

*return*;

    }

*struct* Node *\*current* *=* *\**head;

*while* (*current*->*next* *!=* *NULL*)

    {

*current* *=* *current*->*next*;

    }

*current*->*next* *=* *newNode*;

}

*struct* Node *\*addLists*(*struct* Node *\**list1, *struct* Node *\**list2)

{

*struct* Node *\*result* *=* *NULL*;

*struct* Node *\*current1* *=* list1;

*struct* Node *\*current2* *=* list2;

*int* *carry* *=* 0;

*while* (*current1* *!=* *NULL* *||* *current2* *!=* *NULL* *||* *carry* *!=* 0)

    {

*int* *sum* *=* *carry*;

*if* (*current1* *!=* *NULL*)

        {

*sum* *+=* *current1*->*data*;

*current1* *=* *current1*->*next*;

        }

*if* (*current2* *!=* *NULL*)

        {

*sum* *+=* *current2*->*data*;

*current2* *=* *current2*->*next*;

        }

*carry* *=* *sum* */* 10;

*sum* *%=* 10;

*appendNode*(*&result*, *sum*);

    }

*return* *result*;

}

*void* *linkedlist*(*struct* Node *\*\**head, *int* value)

{

*if* (*\**head *==* *NULL*)

    {

*\**head *=* *createNode*(value);

    }

*else*

    {

*struct* Node *\** *temp* *=* *\**head;

*while* (*temp*->*next* *!=* *NULL*)

        {

*temp* *=* *temp*->*next*;

        }

*temp*->*next* *=* *createNode*(value);

    }

}

*struct* Node *\*reversall*(*struct* Node *\**head)

{

*if*(head->*next!=NULL*)

*reversall*(head->*next*);

*printf*("%d",head->*data*);

}

*int* *main*()

{

*struct* Node *\*num1* *=* *NULL*;

*struct* Node *\*num2* *=* *NULL*;

*long* *long* *int* *n1*;

*long* *long* *int* *n2*;

*printf*("Enter the no. 1 = ");

*scanf*("%lld", *&n1*);

*printf*("Enter the no. 2 = ");

*scanf*("%lld", *&n2*);

*while* (*n1* *>* 0)

    {

*linkedlist*(*&num1*, *n1* *%* 10);

*n1* */=* 10;

    }

*while* (*n2* *>* 0)

    {

*linkedlist*(*&num2*, *n2* *%* 10);

*n2* */=* 10;

    }

*struct* Node *\*result* *=* *addLists*(*num1*, *num2*);

*printf*("Sum: ");

*reversall*(*result*);

*struct* Node *\*temp*;

*temp* *=* *num1*;

*struct* Node *\*temp2*;

*while* (*temp* *!=* *NULL*)

    {

*temp2* *=* *temp*->*next*;

*free*(*temp*);

*temp* *=* *temp2*;

    }

*temp* *=* *num2*;

*while* (*temp* *!=* *NULL*)

    {

*temp2* *=* *temp*->*next*;

*free*(*temp*);

*temp* *=* *temp2*;

    }

*return* 0;

}

OUTPUT:

