programming project

prof .Dr : Ahmed Amer Shahin

Matrix calculator

أسماء الطلاب :-

- **عبدالله محمد عبدالبديع محمد عفيفي (٢٠٨١٢٠٢١١٠١٦٦٥) (قائد المجموعه)**
- **محمود محمد شوقي ابراهيم (٢٠٨١٢٠٢١١٠٠٢٥٧)**
- **محمد محمود محمد عبدالرحمن (٢٠٨١٢٠٢١١٠١٠٢٣)**
- **عبدالرحمن محمد صالح عبدالحليم (٢٠٨١٢٠٢١١٠١٦٦٨)**
- **زياد محمد مصطفي محمود (٢٠٨١٢٠٢١١٠٠٩١٤)**

Rules of students :-

١-عبدالله محمد عبدالبديع محمد (قائد المجموعه) :-

{كتابه محتويات داله ال main واستقبال المصفوفات وإيجاد داله الضرب واستدعاء الدوال وربطها بالمشروع وتجميع المشروع في كود واحد }

٢-محمود محمد شوقي :-

(انشاء ملفات ال sourse and headers وتجميع المشروع وتشغيله للتاكد ووضعه علي فلاشه)

٣- محمد محمود محمد :-

(انشاء دالتي الجمع والطرح واستقبال المصفوفات)

٤-عبدالرحمن محمد صالح

(انشاء داله الضرب)

٥- زياد محمد مصطفي

(انشاء داله مدور المصفوفه وحاول إيجاد داله القسمه)

Idea of project

Matrix calculator (add , subtraction , multipiacation and transpose).

First :-

We ask the computer to give us system of first matrix
And ask to enter the element of first matrix **.**

Second :-

We ask the computer to give us system of second matrix
And ask to enter the element of second matrix **.**

Third :-

The programme display the first matrix and second matrix we entered**.**

According to the structure of matrix we devided the programme to ask if two structure are equal row1 = row2 and column1 = coulmn2 then the programme ask you to enter the clalculation you need all calculation in this condition will achieved .

If the structure not equal but coulmn1 = row2 --- in this condition we cannot add or subtract we only can multiplication and transpose .

If the structure no equal and coulmn1 not equal row1 --- in this condition we can transpose only .

We devidied the project in two sourses file and one header file

In main.c :-

```
#include "matrixfunc.h"
int main(void){

  char sign;
  int matrix1[50][50] , matrix2[50][50], matrix_result[50][50];
  printf("\n******* Matrix1 *******\n\n\n");
  printf("Enter the number of rows  of the  matrix1 maximum 50 :\n\n");
  scanf("%d",&row1);
  printf("Enter the number of columns of the matrix1 maximum 50 :\n\n");
  scanf("%d",&column1);
  printf("Enter the element of matrix1 \n ");
  for (i=0;i<row1;i++){

      for(j=0;j<column1;j++){
           printf(" enter element[%d][%d]:",i+1 , j+1 );

           scanf("%d",&matrix1[i][j]);
      }

  }
  printf("\n\n******* Matrix2 *******\n\n\n");
  printf("Enter the number of rows  of the  matrix2 maximum 50 :\n\n");
  scanf("%d",&row2);
  printf("Enter the number of columns of the matrix2 maximum 50 :\n\n");
  scanf("%d",&column2);
  printf("Enter the elements of matrix2 \n");
  for (i=0;i<row2;i++){

      for(j=0;j<column2;j++){
           printf(" enter element[%d][%d]:",i+1 , j+1 );

           scanf("%d",&matrix2[i][j]);
      }

  }
  printf("\nthe first matrix that you enter with system %d x %d  is:\a\n" ,row1,column1);
  for (i=0;i<row1;i++){
      for(j=0;j<column1;j++){
          printf("%-06d\t",matrix1[i][j]) ;
      }
        printf("\n");
      }
      printf("\n----------------------------------------\n");
       printf("\nthe second matrix that you enter with system %d x %d   is:\a\n", row2,column2);
  for (i=0;i<row2;i++){
      for(j=0;j<column2;j++){
```

```
            printf("%-06d\t",matrix2[i][j]) ;
          }
           printf("\n");
          }

     if(row1==row2 && column1==column2){

      for(i=0;i<5;i++){

    printf("\n***Enter the calculation that you need + for add or - suptraction or *for multipication or / or t for
transpose or b to break :****\n");// '+'or '-'
    fflush(stdin);
    scanf("%s",&sign);
    if(sign == '*' && column1==row2){
      multipication(matrix1,matrix2);
    }
    if(sign == '*' && column1!=row2){
      printf("***you cannot make multibication as row2 not equal column1**** \n");
    }

    if(sign =='+'){
      addition(matrix1,matrix2);
    }

    if(sign=='-'){
    subtractin(matrix1,matrix2);

   }
   if(sign=='t'){
    transpose1(matrix1);
    transpose2(matrix2);
   }
   if(sign=='b'){
    printf("programme ended\n");
    break;
   }

   else{
    //do nothing
   }


   }

}
     else if((column1 == row2 && row1 != column2) ||(column1 == row2 && row1 == column2) ){
      printf("\nthe additional and subtraction are not br able to calculate\n");
      for(i=0;i<3;i++){
        printf("\nenter the calculatin that you need * for multipication or t for transbort or b to break\n");
        fflush(stdin);
         scanf("%s",&sign);
         if(sign=='t'){
```

```
   transpose1(matrix1);
   transpose2(matrix2);
  }
  if(sign == '*' ){
    multipication(matrix1,matrix2);
   }
   if(sign=='b'){
   break;
   }
     }

    }

    else{
     printf("\nyou can make transpose only if you want enter t\n ");
     fflush(stdin);
        scanf("%s",&sign);
     if(sign=='t'){
   transpose1(matrix1);
   transpose2(matrix2);
  }
  else{

  }
    }
}
```

In matrixfunc.c:-

```
#include "matrixfunc.h"
 int row1,column1,row2,column2,row3,column3 , i , j;
void addition(int m[][50],int n[][50]){
  int i,j ;

 int c[row1][column1];
 printf("the sum of the two matrix is:\n");
   for (i=0;i<row1;i++){
       for(j=0;j<column1;j++){
        c[i][j]=m[i][j]+n[i][j];
       printf("%-06d\t",c[i][j]);
        }
        printf("\n");
        }
        }

   void subtractin(int m[][50],int n[][50]){
    int i , j ;

   int c[row1][column1]  ;
   printf("the subtraction of the two matrix is:\n");
   for (i=0;i<row1;i++){
       for(j=0;j<column1;j++){
```

```
c[i][j]=m[i][j]-n[i][j];
printf("%-06d\t",c[i][j]);
}
printf("\n");
}
}
void transpose1(int m[][50]){
 int c[column1][row1];
 printf("the transpose of first matix2 is \n");
 for(i=0 ;i<column1;i++){
   for(j=0;j<row1;j++){
     c[i][j]=m[j][i];
     printf("%-06d\t",c[i][j]);
   }
   printf("\n");
 }
}
void transpose2(int m[][50]){
 int c[column2][row2];
 printf("the transpose of first matix2 is \n");
 for(i=0 ;i<column2;i++){
   for(j=0;j<row2;j++){
     c[i][j]=m[j][i];
     printf("%-06d\t",c[i][j]);
   }
   printf("\n");
 }
}
void multipication(int m[][50],int n[][50]){
  int i , j ,k ;
  int c[row1][column2];
  printf("the multipication of two matrix is :\n");
     for (int i = 0; i < row1; i++)
      {
       for (int j = 0; j < column2; j++)
       {
       int sum = 0;
       for (int k = 0; k < row2; k++)
         sum += m[i][k] * n[k][j];
       c[i][j] = sum;
       }
      }
      for(i=0; i<row1;i++){
        for(j=0;j<column2;j++){
          printf("%-06d\t",c[i][j]);
        }
        printf("\n");
      }
}
```

In matrixfunc.h:-

```
#ifndef MATRIXFUNC_H_INCLUDED
#define MATRIXFUNC_H_INCLUDED

#include <stdio.h>
#include <math.h>
void addition(int  m[][50],int n[][50]);
 void subtractin(int m[][50],int n[][50]);
 void transpose1(int m[][50]);
 void transpose2(int m[][50]);
  void multipication(int m[][50],int n[][50]);
  extern int row1,column1,row2,column2,row3,column3 , i , j;

#endif // MATRIXFUNC_H_INCLUDED
```