T.C. MARMARA ÜNİVERSİTESİ FİZİK BÖLÜMÜ

İLERİ PROGRAMLAMA

ÖDEV RAPORU

KONU: MatMul

Github : MatMul

Begimai Saadakova (120514906)

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**Purpose:** It needs to create two folders as **MatrisMulTest.c** and **MatrisMul.c**.At folder  **MatrisMul.c** there are the functions read the given matrices,multiply these matrices,print them on screen .And also the header folder **MatrisMul.h**  which contains the prototypes of functions.

**Summary:** For the functions need to define the size of matrix,it was defined by the name SİZE for the row and column of matrix.The value of this SİZE had defined at the beginning of code.Into this matrix need to enter the datas and then it can be printed out by function **print\_matrix** which also has two iteration inside of each other.At multiplication of matrix it is important to be equal the number of column of first matrix to number of row of the second matrix, variable k does this work. The result of multiplication stored at the another matrix

**#include<stdio.h >**

**#include "MatrisMul.h"**

**#define SIZE 100**

int main()

{

int matrixA[SIZE][SIZE],matrixB[SIZE][SIZE],result[SIZE][SIZE]; /\*name of the matrices\*/

int row1,col1,row2,col2; /\*rows and columns of the fisrt and second matrices\*/

printf("Enter the size of MatrixA Row1: ");

scanf("%d",&row1);

printf("Enter the size of MatrixA Column1: ");

scanf("%d",&col1);

printf("Enter the size of MatrixB Row2: ");

scanf("%d",&row2);

printf("Enter the size of MatrixB Column2: ");

scanf("%d",&col2);

**if**  (col1!=row2) { /\*If column of first matrix in not equal to row of second matrix, asking

user to enter the size and values of matrix again.\*/

printf("Invalid Order of matrix\n Please re-enter\n");

printf("Enter the size of MatrixA Row1: ");

scanf("%d",&row1);

printf("Enter the size of MatrixA Column1: ");

scanf("%d",&col1);

printf("Enter the size of MatrixB Row2: ");

scanf("%d",&row2);

printf("Enter the size of MatrixB Column2: ");

scanf("%d",&col2);

printf("Enter %d elements for matrixA: \n",row1\*col1); /\*Input data for the matrices\*/

read\_matrix(matrixA,row1,col1);

printf("Enter %d elements for matrixB: \n",row2\*col2);

read\_matrix(matrixB,row2,col2);

printf("MatrixA is :\n"); /\* Print out the entered datas \*/

print\_matrix(matrixA,row1,col1);

printf("MatrixB is :\n");

print\_matrix(matrixB,row2,col2);

MatrisMatMul(matrixA,matrixB,result,row1,col1,col2); /\*result of the multiplication\*/

printf("Result Matrix is :\n");

print\_matrix(result,row1,col2);

}

**else** {

printf("Enter %d elements for matrixA: \n",row1\*col1);

read\_matrix(matrixA,row1,col1);

printf("Enter %d elements for matrixB: \n",row2\*col2);

read\_matrix(matrixB,row2,col2);

printf("MatrixA is :\n");

print\_matrix(matrixA,row1,col1);

printf("MatrixB is :\n");

print\_matrix(matrixB,row2,col2);

MatrisMatMul(matrixA,matrixB,result,row1,col1,col2);

printf("Result Matrix is :\n");

print\_matrix(result,row1,col2);

}

return 0 ;

}

**#ifndef MatrisMul\_H**

**#define MatrisMul\_H**

**#define SIZE 100**

**void MatrisMatMul** (int x[][SIZE],int y[][SIZE],int result[][SIZE],int row1,int column1,int column2); /\*prototype for

multiplication of two matrix\*/

void **read\_matrix** (int x[][SIZE], int rows,int columns); /\*prototype to read the given matrix\*/

void **print\_matrix** (int x[][SIZE], int rows,int columns); /\*prototype to print out the matrix\*/

#endif

**#include<stdio.h >**

**#include "MatrisMul.h"**

**#define SIZE 100**

void **MatrisMatMu**l (int x[][SIZE],int y[][SIZE],int result[][SIZE],int row1,int column1,int column2) /\*multiplication

function\*/

{

int i,j,k;

for (i=1;i<=row1;i++) {

for(j=1;j<=column2;j++) {

result[i][j]=0; /\*Initializing elements of matrix to 0\*/

for(k=1;k<=column1;k++)

result[i][j]+= x[i][k]\*y[k][j]; /\*Multiplying first matrix with second matrix and storing in array "result".\*/

}

}

}

void **read\_matrix** (int x[][SIZE], int rows,int columns)

{

int i,j,k;

for (i=1;i<=rows;i++) { /\* Iteration of rows \*/

for(j=1;j<=columns;j++) { /\* In each row iteration of columns \*/

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

scanf("%d",&x[i][j]); /\*input datas for matrix\*/

}

}

}

void **print\_matrix** (int x[][SIZE], int rows,int columns) {

int i,j,k;

for (i=1;i<=rows;i++) {

for(j=1;j<=columns;j++) {

printf("%d \t",x[i][j]); /\*print out matrix\*/

}

printf("\n");

}

}