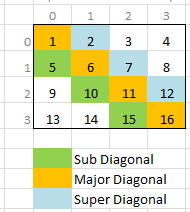
**In class Exercise – ICE May 2nd, 20219 - Due on or before May 5th**

**Objective:** Two dimensional arrays

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| --- |
| **Important instructions:**   * *All programs must include comments at the top of your program: your name, course name-section number (CSIT 575), program name and the program description in brief.* * *Copy and paste your program code and outputs in Part B of each program.* * *Once it is done, save and submit this word file via Canvas.* |

**1. SumOfDiagonal.cpp**

Write a program that reads a 4-by-4 matrix and display the sum of all its elements on the major diagonal, sub-diagonal (below major diagonal) and super-diagonal (above major diagonal).



**Sample Output:**

Enter a 4 by 4 matrix row by row:

1 2 3 4

5 6 7 8

9 10 11 12

13 14 15 16

Sum of the elements in the major diagonal is 34

Sum of the elements in the sub-diagonal is 30

Sum of the elements in the super-diagonal is 21

**Given function prototypes**

double sumMajorDiagonal(const double m[][SIZE]);

double sumSubDiagonal(const double m[][SIZE]);

double sumSuperDiagonal(const double m[][SIZE]);

**Copy and paste your program (source) code and the outputs after this line**

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/\*Erik Gonzalez

CO SCI 575

SumOfDiagonal.cpp

This is a program that reads a 4-by-4 matrix

and display the sum of all its elements on the major diagonal,

sub-diagonal (below major diagonal) and super-diagonal (above major diagonal).\*/

#include <iostream>

using namespace std;

const int SIZE = 4;

double sumMajorDiagonal(const double m[][SIZE]);

double sumSubDiagonal(const double m[][SIZE]);

double sumSuperDiagonal(const double m[][SIZE]);

int main()

{

double matrix[4][4];

cout << "Enter a 4 by 4 matrix row by row" << endl;

for (int i = 0; i < 4; i++)

{

for (int j = 0; j < 4; j++)

{

cin >> matrix[i][j];

}

}

cout << "\nSum of the elements in the major diagonal is " << sumMajorDiagonal(matrix) << endl;

cout << "Sum of the elements in the sub-diagonal is " << sumSubDiagonal(matrix) << endl;

cout << "Sum of the elements in the super-diagonal is " << sumSuperDiagonal(matrix) << endl;

system("Pause");

return 0;

}

//Code that adds up the numbers in the Major Diagonal

double sumMajorDiagonal(const double m[][SIZE])

{

double sum = 0;

for (int i = 0; i < 4; i++)

{

for (int j = 0; j < 4; j++)

{

if (i == j)

sum += m[i][j];

}

}

return sum;

}

//Code that adds up the numbers in the Sub Diagonal

double sumSubDiagonal(const double m[][SIZE])

{

double sum = 0;

for (int i = 1; i < 4; i++)

{

for (int j = 0; j < 4; j++)

{

if (i + j == (SIZE - 1))

sum += m[i][j];

}

}

return sum;

}

//Code that adds up the numbers in the Super Diagonal

double sumSuperDiagonal(const double m[][SIZE])

{

double sum = 0;

for (int i = 0; i < 4; i++)

{

for (int j = 1; j < 4; j++)

{

if (i + j == (j + 1))

sum += m[i][j];

}

}

return sum;

}

OUTPUT: Enter a 4 by 4 matrix row by row

1 2 3 4

5 6 7 8

9 10 11 12

13 14 15 16

Sum of the elements in the major diagonal is 34

Sum of the elements in the sub-diagonal is 30

Sum of the elements in the super-diagonal is 21

Press any key to continue . . .