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#include <iostream>
#include <fstream>
#include <string>
#include <sstream>

using namespace std;

int main()
{
    string filename = "matrix1.txt";
    string line;
    //open matrix file
    ifstream matrix1Read;

    matrix1Read.open(filename);
    getline(matrix1Read, line);
    int MSize = stoi(line);
    int i=0;
    int j=0;
    //creating temp array
    int* bla[MSize];
    for(i=0; i<MSize; i++){
        bla[i]=new int[MSize];
    }
    int* myMatrix1[MSize];
    for(i=0; i<MSize; i++){
        myMatrix1[i]=new int[MSize];
    }
    while(getline(matrix1Read, line)){
        istringstream matrix1Line(line);
        string matrix1Value;
        while (getline(matrix1Line, matrix1Value, ','))
        {
            myMatrix1[i][j] = stoi(matrix1Value); //place values in matrix
            j++;
        }
        j=0;
        i++;
    }
}

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string filename2 = "matrix2.txt";
//open matrix file
ifstream matrix2Read;

matrix2Read.open(filename2);
getline(matrix2Read, line);
int MSize2 = stoi(line);
double* myMatrix2[MSize2];
for(i=0; i<MSize2; i++){
    myMatrix2[i]=new double[MSize2];
}
i=0;
j=0;

while(getline(matrix2Read, line)){
    istringstream matrix2Line(line);
    string matrix2Value;
    while (getline(matrix2Line, matrix2Value, ','))
    {
        myMatrix2[i][j] = stod(matrix2Value); //place values in matrix

        j++;
    }
    j=0;
    i++;
}

// Multiply matrices
double* matrixMul[MSize];
for(i=0; i<MSize; i++){
    matrixMul[i]=new double[MSize];
}
//start clock
clock_t mulTime;
clock_t mulTimeDif;
mulTime = clock();
for(i=0; i<MSize; i++){
    for(j=0; j<MSize; j++){
        for(int k=0; k<MSize; k++){
            matrixMul[i][j] += myMatrix1[i][k] * myMatrix2[k][j];
        }
    }
}

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        }
    }
}
//end clock

mulTimeDif = clock() - mulTime;
cout << "clock time: " << (float)mulTime/CLOCKS_PER_SEC;

//output to file
ofstream matrixWrite;
matrixWrite.open("matrixOutput.txt");
matrixWrite << to_string(MSize) << endl;
for(int i=1; i<=MSize; i++){
    for(int j=1; j<=MSize; j++){
        matrixWrite << matrixMul[i][j] << ',';

    }
    matrixWrite << endl;
}
matrixWrite.close();
return 0;
}

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