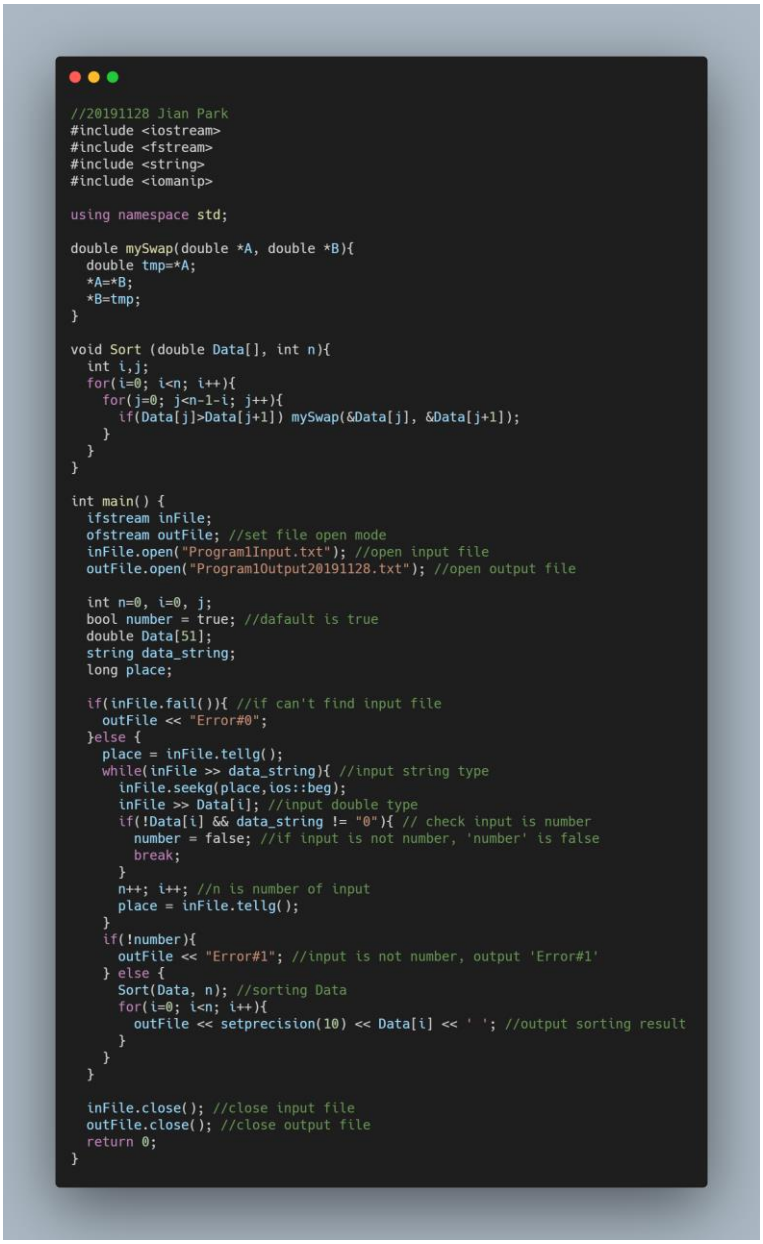
Program1



```cpp
//20191128 Jian Park
#include <iostream>
#include <fstream>
#include <string>
#include <iomanip>

using namespace std;

double mySwap(double *A, double *B){
  double tmp=*A;
  *A=*B;
  *B=tmp;
}

void Sort (double Data[], int n){
  int i,j;
  for(i=0; i<n; i++){
    for(j=0; j<n-1-i; j++){
      if(Data[j]>Data[j+1]) mySwap(&Data[j], &Data[j+1]);
    }
  }
}

int main() {
  ifstream inFile;
  ofstream outFile; //set file open mode
  inFile.open("Program1Input.txt"); //open input file
  outFile.open("Program1Output20191128.txt"); //open output file

  int n=0, i=0, j;
  bool number = true; //dafault is true
  double Data[51];
  string data_string;
  long place;

  if(inFile.fail()){ //if can't find input file
    outFile << "Error#0";
  }else {
    place = inFile.tellg();
    while(inFile >> data_string){ //input string type
      inFile.seekg(place,ios::beg);
      inFile >> Data[i]; //input double type
      if(!Data[i] && data_string != "0"){ // check input is number
        number = false; //if input is not number, 'number' is false
        break;
      }
      n++; i++; //n is number of input
      place = inFile.tellg();
    }
    if(!number){
      outFile << "Error#1"; //input is not number, output 'Error#1'
    } else {
      Sort(Data, n); //sorting Data
      for(i=0; i<n; i++){
        outFile << setprecision(10) << Data[i] << ' '; //output sorting result
      }
    }
  }

  inFile.close(); //close input file
  outFile.close(); //close output file
  return 0;
}
```

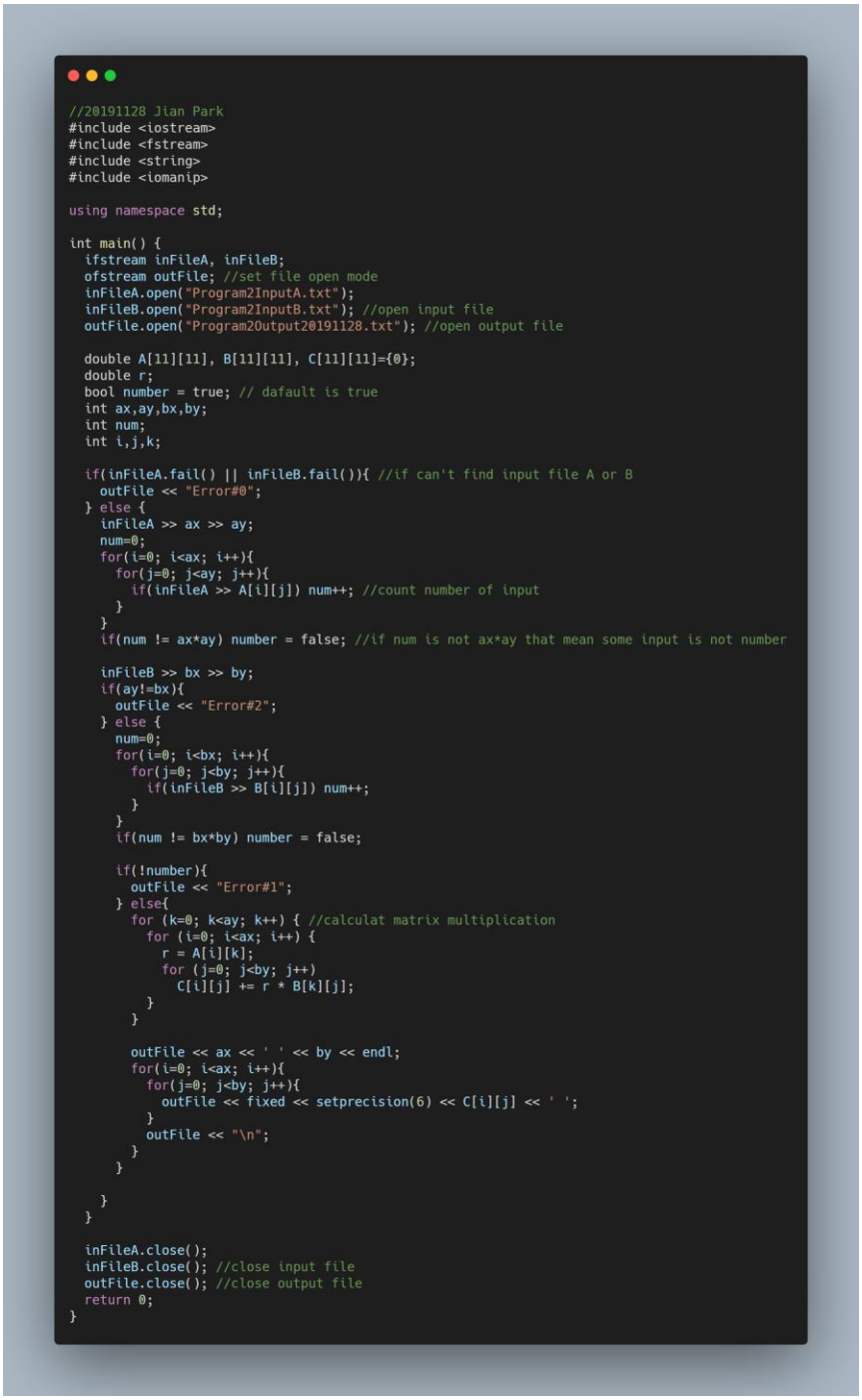
Define mySwap() function using point. The function receives address of A and B. Then put value of A in 'tmp'. And put value of B in value of A and put value of tmp in value of B.

Sort function is Sorting array Date which length is n. When I is starting at 0, j also be starting at 0 to n-i-1. As j progresses, it compares adjacent array values and call mySwap() when the j-th value is greater than the j+1-th value.

'inFile.fail()' is true, it's means can't find input file. (Error#0)

Data_string is string type, Data[i] is double type. When contains anything else than numbers, Data[i] is false and Data_string is not '0'. (Error#1)

Program2



```cpp
//20191128 Jian Park
#include <iostream>
#include <fstream>
#include <string>
#include <iomanip>

using namespace std;

int main() {
  ifstream inFileA, inFileB;
  ofstream outFile; //set file open mode
  inFileA.open("Program2InputA.txt");
  inFileB.open("Program2InputB.txt"); //open input file
  outFile.open("Program2Output20191128.txt"); //open output file

  double A[11][11], B[11][11], C[11][11]={0};
  double r;
  bool number = true; // dafault is true
  int ax,ay,bx,by;
  int num;
  int i,j,k;

  if(inFileA.fail() || inFileB.fail()){ //if can't find input file A or B
    outFile << "Error#0";
  } else {
    inFileA >> ax >> ay;
    num=0;
    for(i=0; i<ax; i++){
      for(j=0; j<ay; j++){
        if(inFileA >> A[i][j]) num++; //count number of input
      }
    }
    if(num != ax*ay) number = false; //if num is not ax*ay that mean some input is not number

    inFileB >> bx >> by;
    if(ay!=bx){
      outFile << "Error#2";
    } else {
      num=0;
      for(i=0; i<bx; i++){
        for(j=0; j<by; j++){
          if(inFileB >> B[i][j]) num++;
        }
      }
      if(num != bx*by) number = false;

      if(!number){
        outFile << "Error#1";
      } else{
        for (k=0; k<ay; k++) { //calculat matrix multiplication
          for (i=0; i<ax; i++) {
            r = A[i][k];
            for (j=0; j<by; j++)
              C[i][j] += r * B[k][j];
          }
        }

        outFile << ax << ' ' << by << endl;
        for(i=0; i<ax; i++){
          for(j=0; j<by; j++){
            outFile << fixed << setprecision(6) << C[i][j] << ' ';
          }
          outFile << "\n";
        }
      }

    }
  }

  inFileA.close();
  inFileB.close(); //close input file
  outFile.close(); //close output file
  return 0;
}
```

Matrix multiplication is multiplication is put sum of A[i][k] * B[k][j] in C[i][j] when k is 0 to ay (==by).

'inFileA.fail()' or 'inFileB.fail()' is true, it's means can't find input file. (Error#0)

'num' is count number of input. Each file must input x*y times. So if num is different ax*ay (or bx*by when input file B), they contains anything else than numbers. (Error#1)

When ay is different bx, AB is not defined for the matrices A and B. (Error#2)