Report of Assignment 3----File I/O

Meng Wei

1. Results

I just give the result of the third program here. The average of all elements of matrix C is 11.6877. This result is printed out into the file named “average.txt”.

1. Source codes

(1). Program 1

#include "stdafx.h"

#include <iostream>

#include <stdio.h>

#include <stdlib.h>

#pragma warning(disable:4996)

using namespace std;

int wordscount(char\* ptr);

int main()

{

FILE \*pFile;

long ISize;

char \*buffer;

size\_t result;

int count = 0;

pFile = fopen("t.bin", "r");

if (pFile == NULL) {

fputs("File error", stderr);

exit(1);

}

//obtain file size

fseek(pFile, 0, SEEK\_END);

ISize = ftell(pFile);

fseek(pFile, 0, SEEK\_SET);

//allocate memory to contain the whole file;

buffer = (char\*)malloc(sizeof(char)\*ISize);

if (buffer == NULL) {

fputs("Memory error", stderr);

exit(2);

}

//copy the file into the buffer

result = fread(buffer, 1, ISize, pFile);

if (result != ISize)

{

fputs("Reading error", stderr);

exit(3);

}

count = wordscount(buffer);

cout << count << endl;

//terminate

fclose(pFile);

free(buffer);

return 0;

}

//wordscount function

int wordscount(char\* ptr)

{

int wordscount = 0;

while (\*ptr != '\0')

{

while (\*ptr != ' ' && \*ptr != '\n')

{

ptr++;

}

wordscount++;

ptr++;

while (\*ptr == ' ' || \*ptr == '\n')

{

ptr++;

}

}

return wordscount;

}

(2). Program 2

#include "stdafx.h"

#include <iostream>

#include <stdio.h>

#include <stdlib.h>

#pragma warning(disable:4996)

int main()

{

double \*\*A, \*\*B;

A = new double\*[10];

B = new double\*[10];

int i, j;

for (i = 0; i<10; i++) {

A[i] = new double[10]();

B[i] = new double[10]();

}

for (i = 0; i<10; i++) {

for (j = 0; j<10; j++) {

A[i][j] = i + j + 1.0;

B[i][j] = 1 / (i + j + 1.0);

}

}

FILE \*pFile;

pFile = fopen("matrices.dat", "wb");

for (i = 0; i<10; i++) {

for (j = 0; j<10; j++) {

fprintf(pFile, "%f ", A[i][j]);

}

fprintf(pFile, "\n");

}

for (i = 0; i<10; i++) {

for (j = 0; j<10; j++) {

fprintf(pFile, "%f ", B[i][j]);

}

fprintf(pFile, "\n");

}

//Release the memory

for (i = 0; i<10; i++) {

delete[] A[i];

delete[] B[i];

}

delete[] A;

delete[] B;

fclose(pFile);

}

(3). Program 3

#include "stdafx.h"

#include <iomanip>

#include <array>

#include <iostream>

#include <fstream>

#include <sstream>

#include <string>

#include <stdio.h>

int rowA = 0;

int colA = 0;

float s = 0;

float average;

using namespace std;

int main()

{

string lineA;

float x;

float arrayA[20][20] = { { 0.0 } };

double \*\*A, \*\*B, \*\*C;

A = new double\*[10];

B = new double\*[10];

C = new double\*[10];

int i, j, k;

ifstream fileIN;

cout << "Please Enter the data file below and press enter:" << endl;

fileIN.open("matrices.dat");

//Error Check

if (fileIN.fail())

{

cerr << "\*File you are trying to access cannot be found or opened!";

exit(1);

}

//Reading the data file

cout << "\n" << endl;

while (fileIN.good()) {

while (getline(fileIN, lineA))

{

istringstream streamA(lineA);

colA = 0;

while (streamA >> x) {

arrayA[rowA][colA] = x;

colA++;

}

rowA++;

}

}

for (int i = 0; i < rowA; i++) {

for (int j = 0; j < colA; j++) {

cout << left << setw(10) << arrayA[i][j] << " ";

}

cout << endl;

}

cout << "\n" << endl;

for (i = 0; i<10; i++) {

A[i] = new double[10]();

B[i] = new double[10]();

C[i] = new double[10]();

}

for (i = 0; i<10; i++) {

for (j = 0; j<10; j++) {

A[i][j] = arrayA[i][j];

}

}

for (i = 10; i<20; i++) {

for (j = 0; j<10; j++) {

B[i - 10][j] = arrayA[i][j];

}

}

//Reading into matrix A

cout << "Matrix A=" << endl;

for (i = 0; i<10; i++) {

for (j = 0; j<10; j++) {

cout << left << setw(10) << A[i][j] << " ";

}

cout << endl;

}

cout << "\n" << endl;

// Reading into matrix B

cout << "Matrix B=" << endl;

for (i = 0; i<10; i++) {

for (j = 0; j<10; j++) {

cout << left << setw(10) << B[i][j] << " ";

}

cout << endl;

}

//Multiplying A and B to get matrix C

for (i = 0; i < 10; i++) {

for (j = 0; j < 10; j++) {

for (k = 0; k < 10; k++) {

s = s + A[i][k] \* B[k][j];

}

C[i][j] = s;

s = 0;

}

}

cout << "\n" << endl;

cout << "Matrix C=" << endl;

for (i = 0; i<10; i++) {

for (j = 0; j<10; j++) {

cout << left << setw(10) << C[i][j] << " ";

}

cout << endl;

}

cout << "\n" << endl;

//Computing the average of all elements of C

cout << "The average of all elements of Matrix C is:" << endl;

for (i = 0; i < 10; i++)

{

for (j = 0; j < 10; j++) {

s = s + C[i][j];

}

}

average = s / 100;

cout << average << endl;

//Print out the average of all elements of C to a text file

fstream textfile;

textfile.open("average.txt");

textfile << "The average of all elements of C is : " << average << endl;

textfile.close();

return 0;

}