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**CMP 120L– Introduction to Computer Science I Lab**

**Lab 14**

**Exercise 1:**

Write a C++ function **int f1 (int x[], int N, int& sm);** that accepts an integer array **x** of size **N**, returns the index (position) of the smallest integer present in the array **x,** and updates the variable **sm** with the value of the smallest element in the array.

For example, if in main(), we have int y[5]= {11,2,3,9,6}; and int z; then the call f1(y,5, z) returns 1, and z should be 2 in main().

Write a main() program as well to test the working of **f1()** function for the above-mentioned example.

#include <iostream>

using namespace std;

int f1(int x[], int N, int&sm);

void main()

{

int y[5] = { 11, 2, 3, 9, 6 };

int z;

int x;

x = f1(y, 5, z);

cout << "The index of the smallest integer in the array x is:" << x << endl;

cout << "The value of the smallest element in the array is:" << z << endl;

}

int f1(int x[], int N, int&sm)

{

int index;

sm = x[0];

index = 0;

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

{

if (x[i] < sm)

{

sm = x[i];

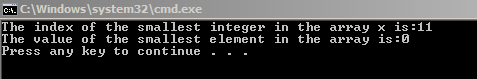
index = i;

}

}

return(index);

}



**Exercise 2:**

Write a function **bool equals(int x[], int y[], int N)**, that accepts two integer arrays **x** and **y**, each of size **N**, and returns true if and only if the ith element of **x** is equal to ith element of **y** (i.e. x[i] == y[i]), for all i, i=0, 1, 2,.., N-1; otherwise, it returns false. Write a main() program to test the function **equals(),** and print appropriate messages.

For example, if in main(), we have three arrays:

int a[5]= {1,2,3,4,5};

int b[5]= {1,2,3,4,5};

int c[5]= {1,2,2,4,5};

then, in main(), the call **equals(a,b,5)** should return turn true; while the call **equals(a,c,5)** should return false.

#include <iostream>

using namespace std;

bool equals(int x[], int y[], int N);

void main()

{

int x;

int a[5] = { 1, 2, 3, 4, 5 };

int b[5] = { 1, 2, 3, 4, 5 };

int c[5] = { 1, 2, 2, 4, 5 };

int tr;

tr = equals(a,b,5);

if (tr) cout << "all values are equal in order" << endl;

else cout << "Not all values are equal nor in order" << endl;

tr = equals(a, c, 5);

if (tr) cout << "all values are equal in order" << endl;

else cout << "Not all values are equal nor in order" << endl;

}

bool equals(int x[], int y[], int N)

{

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

{

if (x[i] != y[i])

{

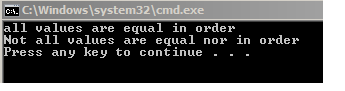
return false;

}

}

return true;

}



**Exercise 3:**

Write a C++ program that performs the following tasks in this sequence:

* Declares an array **num[]** of five integers.
* Declare an output stream and connect it to a file **out.txt.**
* Asks the user to input five integers one by one, and stores the integers as array elements of **num[]**.
* Stores the array elements in the file **out.txt**.

Check the contents of the file **out.txt** after your program ends execution.

#include <iostream>

#include <fstream>

using namespace std;

void main()

{

ofstream out("output.txt");

int num[5];

cout << "Input five integers: " << endl;

for (int i = 0; i < 5; i++)

{

cin >> num[i];

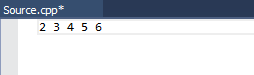
out << num[i] << " ";

}

out.flush();

out.close();

}



**Exercise 4:**

Write a C++ program that reads five integer values from the text file **input.txt**, and calculates the average of those values, and then to print the result to an output file **out.txt**. Prepare the **input.txt** file with some five integers (one integer per line) before running your program, and check the file **out.txt** after your program ends execution.

#include <iostream>

#include <fstream>

using namespace std;

void main()

{

ifstream in("input.txt");

ofstream out("out.txt");

double avg = 0;

int x;

cout << "The value are: ";

for (int i = 0; i < 5; i++)

{

in >> x;

avg += x;

}

avg = avg / 5;

out << "The average for the integers is: ";

out << avg;

out.flush();

out.close();

}



