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/*****
* AUTHOR      : Amirarsalan Valipour & Ali Eshghi
* STUDENT ID  : 1103126
* LAB #1      : Random Number Generator
* CLASS       : CS 1C
* SECTION     : MW - 5 pm - 7 pm
* DUE DATE    : 1/13/2020
*****/

#ifndef HEADER_H_
#define HEADER_H_

#include<iostream> //for input and output
#include<iomanip>   //for measuring and style of the output
#include<stdlib.h>  //for random number generator
#include<sstream>   //for converting string to integer
#include<time.h>    //for random number generator
#include<string>    //for using string
#include<cctype>    //for converting the string to integer
#include<cstdlib>   //for

using namespace std; //using for string

const int AR_SIZE = 15; // array size

#define charToInt(c)(c-'0'); //method for

typedef int num; //changing the integer type variable name to "num"

typedef stringstream convert; //changing the

#endif /* HEADER_H_ */

```

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#include "Header.h"

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int main()
{
    //CONSTANTS

    const int  PROMPT = 14;
    const int  asNum  = 1;
    const char PROGRAMMER[50] = "Amirarsalan Valipour & Ali Eshghi";
    const char CLASS[5]      = "CS1B";
    const char SECTION[25]   = "MW: 5p - 7p";
    const char asType = 'A';
    const char asName[50] = "Random Number Generator";


    //VARIABLES

    num integer;           //Calc & Out - Random Integer
    num intAr[AR_SIZE];    //Calc & Out - Random Integer Array
    num sumAr[AR_SIZE];    //Calc & Out - Total Value Array
    num sortedIntAr[AR_SIZE]; //Calc & Out - Sorted Integer Array
    num reverseIntAr[AR_SIZE]; //Calc & Out - Reversed Numbers Array


    num sum;    //Calc & Out - Total Values
    num i;      //Calc - LCV
    num j;      //Calc - LCV
    num temp;   //Calc - Temporary Value
    num k;
    num strLen;
    num intNum;
    num strSum;


    convert ss;


    string s;


    std::string textNum;


    //INITIALIZATION

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sum = 0;
strSum = 0;

//PRINT HEADER

cout << left;
cout << endl;
cout << "*****";
cout << "\n* PROGRAMMED BY : " << PROGRAMMER;
cout << "\n* " << setw(PROMPT) << "CLASS" << ": " << CLASS;
cout << "\n* " << setw(PROMPT) << "SECTION" << ": " << SECTION;
cout << "\n* ";

if (toupper(asType) == 'L')
{
    cout << "LAB #" << setw(8);
}

else
{
    cout << "ASSIGNMENT #" << setw(1);
}

cout << asNum << " : " << asName;
cout << "\n*****";
cout << "**\n\n";
cout << right;

cout << "Generating RANDOM integers...\n";

//PROCESSING

srand(time(NULL)); //time seed

//generates 16 random number

for(i = 0; i < 16; i++)
{
    integer = rand() % 99 + 1;

    intAr[i] = integer;

    cout << integer << endl;
}

cout << endl;

```

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//bubble sort the array

for(int i = 0; i < AR_SIZE; i++)
{
    for(j = 0; j < AR_SIZE; j++)
    {
        if(intAr[j] > intAr[j+1])
        {
            temp          = intAr[j];

            intAr[j]      = intAr[j+1];

            intAr[j+1] = temp;
        }
    }
}

//initialize sorted numbers in another array

cout << "Sorting...\n";

for(i = 0; i < AR_SIZE; i++)
{
    sortedIntAr[i] = intAr[i];

    cout << sortedIntAr[i];

    cout << endl;
}

cout << endl;

//Reversing the numbers

cout << "Reversing Each Integer: \n";

for(i = 0; i < AR_SIZE; i++)
{
    k = sortedIntAr[i];

    ss << k;

    ss >> s;

    if(s.length() == 1)
    {

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        cout << s;
        cout << endl;
    }

    else if(s.length() == 2)
    {
        if(s[1] == '0')
        {
            cout << s[0];
            cout << endl;
        }

        else
        {
            cout << s[1];
            cout << s[0];
            cout << endl;
        }
    }

    ss.clear();
    s.clear();
}
cout << endl << endl;

```

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//find the sum of the random numbers and store them

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cout << "Total of Each Integers: \n";

for(i = 0; i < AR_SIZE; i++)
{
    k = sortedIntAr[i];

    ss << k;

    ss >> s;

    if(s.length() == 1)
    {
        cout << s;
        cout << endl;
    }

    else if(s.length() == 2)
    {
        for(i = 0; i < s.length(); ++i)
        {
            int a = charToInt(s[i]);

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        strSum = strSum + a;

    }

    cout << strSum;
    cout << endl;
    strSum = 0;
}

ss.clear();
s.clear();
}

cout << endl << endl;

return 0;
}
```

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*****
* PROGRAMMED BY : Amirarsalan Valipour & ALi Eshghi
* CLASS          : CS1B
* SECTION        : MW: 5p - 7p
* ASSIGNMENT #1  : Random Number Generator
*****
```

Generating RANDOM integers...

```
30
6
43
8
80
26
35
89
70
43
39
48
55
13
95
82
```

Sorting...

```
6
8
13
26
30
35
39
43
43
48
55
70
80
82
89
```

Reversing Each Integer:

```
6
8
31
62
3
53
```

93
34
34
84
55
7
8
28
98

Total of Each Integers:

6
8
4
8
3
8
12
7
7
12
10
7
8
10
17