**Programming Challenges 2 October 15, 2018 - Due on or before 10:10pm**

**Objective:** Two-Dimensional Array

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| --- |
| **Important instructions:**   * *All programs must include comments at the top of your program: your name, course name-section number (e.g. CSIT 839 -26953), program name and the program description in brief.* * *Copy and paste your program code and outputs in Part B of each program.* * *Once it is done, save and submit this word file via Canvas.* |

To receive full credit, your program must:

- Include simple, clear comments explaining your program logic

- Indent your code and line up your braces

- Give descriptive variable names

- Use name constants to write clearer code. Name constant must declare with CAPITAL.

- Your output should be the same as the given sample output.

**1. WeatherReport.cpp**

Write a program that uses two-dimension array to store the highest temperature and lowest temperature for 12 of the year. The program should calculate and display the average high, average low, and the highest and lowest temperatures for the year. Your program should consist the following function prototypes:

void getData(int twoDim[][2], int rows);

int averageHigh(int twoDim[][2], int rows);

int averageLow(int twoDim[][2], int rows);

int indexHighTemp(int twoDim[][2], int rows);

int indexLowTemp (int twoDim [][2], int rows);

**Use the following data to test your program:**

High temperature: 38 40 45 52 65 80 75 90 85 82 70 44

Low temperature: -10 5 2 25 30 40 45 60 50 46 15 5

**Sample Output:**

Enter high temperature for each month

38 40 45 52 65 80 75 90 85 82 70 44

Enter low temperature for each month

-10 5 2 25 30 40 45 60 50 46 15 5

Average high temperature: 63

Average low temperature: 26

Highest temperature: 90

Lowest temperature: -10

**Copy and paste your program (source) code and the outputs after this line**

**+++++++++++++++++++++++++++++++++++++++++++++++++**

/\*

WeatherReport.cpp

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Purpose: to store the highest

and lowest temperatures for 12

months of the year. To calculate

and display the aveage high, average

low, and the highest and lowest temps.

for the year.

\*/

#include “stdafx.h”

#include <iostream>

using namespace std;

/\* Prototypes \*/

void getData(int twoDim[][2], int rows);

int averageHigh(int twoDim[][2], int rows);

int averageLow(int twoDim[][2], int rows);

int indexHighTemp(int twoDim[][2], int rows);

int indexLowTemp(int twoDim[][2], int rows);

const int ROW\_SIZE = 12;

int main()

{

int temperatures[ROW\_SIZE][2]; //2D array

getData(temperatures, ROW\_SIZE);

return 0;

}

/\* Functions \*/

void getData(int twoDim[][2], int rows)

{

int indexHigh,

indexLow;

cout << "Enter high temperature for each month:" << endl;

for (int i = 0; i < 1; i++)

{

for (int j = 0; j < rows; j++)

{

cin >> twoDim[j][i];

}

}

cout << "Enter low temperature for each month:" << endl;

for (int i = 1; i < 2; i++)

{

for (int j = 0; j < rows; j++)

{

cin >> twoDim[j][i];

}

}

cout << "Average high temperature: " << averageHigh(twoDim, rows) << endl;

cout << "Average low temperature: " << averageLow(twoDim, rows) << endl;

indexHigh = indexHighTemp(twoDim, rows);

indexLow = indexLowTemp(twoDim, rows);

for (int i = 0; i < 1; i++)

{

for (int j = 0; j < rows; j++)

{

if (indexHigh == j)

{

cout << "Highest temperature: " << twoDim[j][i] << endl;

}

}

}

for (int i = 1; i < 2; i++)

{

for (int j = 0; j < rows; j++)

{

if (indexLow == j)

{

cout << "Lowest temperature: " << twoDim[j][i] << endl;

}

}

}

}

/\* To get the average of the high temperatures \*/

int averageHigh(int twoDim[][2], int rows)

{

int sumOfHigh = 0,

average;

for (int i = 0; i < 1; i++)

{

for (int j = 0; j < rows; j++)

{

sumOfHigh += twoDim[j][i];

}

}

average = sumOfHigh/rows;

return average;

}

/\* To get the average of the low temperatures \*/

int averageLow(int twoDim[][2], int rows)

{

int sumOfLow = 0, average;

for (int i = 1; i < 2; i++)

{

for (int j = 0; j < rows; j++)

{

sumOfLow += twoDim[j][i];

}

}

average = sumOfLow/rows;

return average;

}

/\* index of the highest temperature \*/

int indexHighTemp(int twoDim[][2], int rows)

{

int indexOfHigh = 0,

highestNumber = twoDim[0][0];

for (int i = 0; i < 1; i++)

{

for (int j = 0; j < rows; j++)

{

if(twoDim[j][i] > highestNumber)

{

highestNumber = twoDim[j][i];

indexOfHigh = j;

}

}

}

return indexOfHigh;

}

/\* index of the lowest temperature \*/

int indexLowTemp(int twoDim[][2], int rows)

{

int indexOfLow = 0,

lowestNumber = twoDim[0][1];

for (int i = 0; i < 1; i++)

{

for (int j = 0; j < rows; j++)

{

if(twoDim[j][i] < lowestNumber)

{

lowestNumber = twoDim[j][i];

indexOfLow = j;

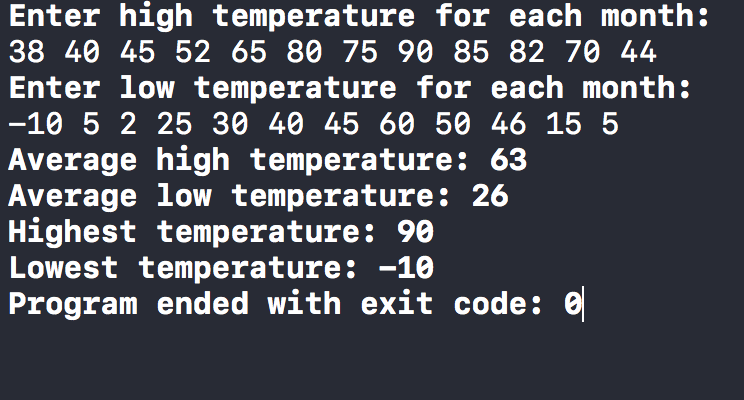
}

}

}

return indexOfLow;

}

****