Raymond Guevara
Brent Nishioka
CECS 282 - sec 7

Source code:

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#include <iostream>
#include <string>
#include <fstream>
#include <math.h>
#include <bits/stdc++.h>

using namespace std;

const double ABOVE_AVERAGE {1.2};
const double BELOW_AVERAGE {.75};
const int NUM_MONTHS {12};

void inputRainfall(int rainFall[], int NUM_MONTHS);
int calculateAverageRainFall(int rainFall [], int NUM_MONTHS);
void classifyAndDisplayRainfall(int rainFall[], int months);

int main(){
   int monthRain[12] {0};


   inputRainfall(monthRain,NUM_MONTHS);
   cout << "The year's average monthly rainfall was " <<
calculateAverageRainFall(monthRain, NUM_MONTHS) << "mm." << endl;
   classifyAndDisplayRainfall(monthRain, NUM_MONTHS);

   return 0;
}

void inputRainfall(int rainFall[], int NUM_MONTHS){
   ifstream file ("rainfall.txt");

   int input;
```

```
    int index {0};
    while(file >> input){
        if (index < NUM_MONTHS){
            rainFall[index] = input;
            index ++;
        }
    }
}

int calculateAverageRainFall(int rainFall[], int NUM_MONTHS){
    double sum {0};

    for (int i {0}; i < NUM_MONTHS; i++){
        sum += rainFall[i];
    }

    double avgRain = sum / NUM_MONTHS;
    return ceil(avgRain);
}

void classifyAndDisplayRainfall(int rainFall[], int months){
    int avgRain = calculateAverageRainFall(rainFall, months);
    string monthsArr[12] = {"January", "February", "March", "April", "May",
"June", "July", "August","September", "October", "November", "December"};
    int highestRain {rainFall[0]};
    int highestRainIndex {0};
    int lowestRain{rainFall[0]};
    int lowestRainIndex {0};
    for (int i {0}; i < months; i++){
        if (rainFall[i] > highestRain){
            highestRain = rainFall[i];
            highestRainIndex = i;
        }
        if (rainFall[i] < lowestRain){
            lowestRain = rainFall[i];
            lowestRainIndex = i;
        }
```

```
    }

    cout << monthsArr[highestRainIndex] << " has the highest rainfall " <<
"(" << rainFall[highestRainIndex] << "mm)." << endl;
    cout << monthsArr[lowestRainIndex] << " has the lowest rainfall " <<
"(" << rainFall[lowestRainIndex] << "mm)." << endl;
    cout << endl;
    printf("%-10s%-15s%-16s\n", "Month", "Rainfall(mm)",
"Classifications");
    printf("%-10s%8s%8s\n", "------ ", "------------  ",
"----------------");

    for(int i {0}; i < months; i++){
        if (rainFall[i] > (ABOVE_AVERAGE * avgRain)){
           printf("%4d%13d%17s\n", i+1, rainFall[i], "Rainy");
        }
        else if (rainFall[i] < (BELOW_AVERAGE * avgRain)){
            printf("%4d%13d%17s\n", i+1, rainFall[i], "Dry");
        }
        else{
            printf("%4d%13d%17s\n", i+1, rainFall[i], "Average");
        }
    }
}
```

Output:

The year's average monthly rainfall was 139mm.
September has the highest rainfall (190mm).
January has the lowest rainfall (95mm).

Month	Rainfall(mm)	Classifications
1	95	Dry
2	100	Dry
3	120	Average
4	130	Average
5	135	Average
6	145	Average
7	155	Average
8	185	Rainy
9	190	Rainy
10	160	Average
11	130	Average
12	120	Average