```cpp
//Nhan Vo and Ian Lee
// CECS 282 LAB 1-Problem 3
#include <cmath>
#include<iostream>
#include<fstream>
#include <iomanip>
using namespace std;
/*
inputRainfall function:
The function reads the monthly rainfall from the file rainFall.txt and stores them in the array rainFall
*/
void inputRainfall(int rainFall[], int size){

    //Open the file
    ifstream inputFile;

    inputFile.open("rainfall.txt");

    //Initialize month counter
    int month = 0; //first month

    //Read the monthly rainfall in the file
    while(size!=0){

        size--;// decrement the size of

        inputFile >> rainFall[month];// store the number from file into the array


        month++;// increment the month

    }
    inputFile.close();//close the file

}

/*
calculateAverageRainFall function:
Return the average monthly rainfall (rounded to the nearest millimeter).
*/

int calculateAverageRainFall(int rainFall[],int size){

    int i=0;
    int temp=size;
    double sum;
    double ave=0.0;


    //Find the sum of the total rain fall
    while(temp!=0){
```

```
51
52          temp--;
53
54          sum+=rainFall[i];
55
56          i++;
57
58      }
59
60      ave=sum/size;// Divide the sum by the
61
62      return int(round(ave));// round the average
63
64  }
65
66  /*
67  classifyAndDisplayRainfall function:
68  Display the average monthly rainfall, the month with the highest rainfall, and
      the month with the lowest rainfall.
69  Also classify each month as average, rainy, or dry.
70  */
71
72  void classifyAndDisplayRainfall(int rainFall[], int months){
73      //Create the string array monthsName
74      string monthsName[12] = {"January", "February", "March", "April", "May",
        "June", "July", "August", "September", "October", "November", "December"};
75
76      string Classification[12];//Initialize the Classification (drainy or dry or
        neither)
77      int diff=1;
78      int min;
79      int max;
80      int maxMonth;
81      int minMonth;
82
83      float dry=0.75;
84      float rainy=1.2;
85
86      double ave=calculateAverageRainFall(rainFall,months);
87
88      max=min=rainFall[0];// Initialize min and max rain fall value
89
90      minMonth=maxMonth=0;// Initialize the min and max rain fall months
91
92      for(int i=0;i<months;i++){
93
94          if(rainFall[i]<min){// find min rain fall month
95              min=rainFall[i];
96              minMonth=i;
97          }
98
99          else if(rainFall[i]>max){// find max rain fall month
```

```
100             max=rainFall[i];
101             maxMonth=i;
102         }
103
104         if(rainFall[i]<(ave*dry)){// categorize each month as dry, rainy or
              average
105             Classification[i]="Dry";
106         }
107
108         else if(rainFall[i]>(ave*rainy)){
109             Classification[i]="Rainy";
110         }
111
112         else{
113             Classification[i]="Average";
114         }
115
116     }
117     // Out put the value
118     cout<<"The year's average monthly rainfall was "<<ave<<" mm."<<endl;//
          Average rain fall in a year
119
120     cout<<monthsName[maxMonth]<<" has the highest rainfall ("<<max<<"
          mm)."<<endl;// highest rain fall in a year
121
122     cout<<monthsName[minMonth]<<" has the lowest rainfall ("<<min<<"
          mm)."<<endl;// lowest rain fall in a year
123
124     cout<<endl;
125
126     cout<<"Month"<<setw(20)<<"Rainfall(mm)"<<setw(20)<<"Classification"<<endl;//
          Output rain fall table for each month.
127
128     cout<<"-----"<<setw(20)<<"------------"<<setw(20)<<"--------------"<<endl;
129
130     for(int i=0;i<months;i++){
131         // output rainfall for each month
132         cout<<setw(2)<<i+diff<<setw(18)<<rainFall[i]<<setw(20)<<Classification[i]
              <<endl;
133
134     }
135
136 }
137
138 /*
139 Driver:
140 Create an array to store the value from input file
141 Call for the classifyAndDisplayRainfall and output the result.
142 */
143
144 int main()
145 {
```

```
146     int months=12;// 12 months
147
148     int rainFall[months];
149
150     inputRainfall(rainFall,months);// call inputRainfall to store rainfall data
151
152     classifyAndDisplayRainfall(rainFall,months);//Call classifyAndDisplayRainfall
           function
153
154     return 0;
155 }
156
```

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

Month          Rainfall(mm)       Classification
-----          ------------       --------------
 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


...Program finished with exit code 0
Press ENTER to exit console.
```