#include <iostream>

#include <string>

#include <iomanip>

using namespace std;

const int sizeA = 12;

void input(float[], float[], string[], int&);

void inputArray(float[], string[], int, int);

void tabular(float[],float[],string[],int);

void graph(float[], float[], string[], int);

void line();

void asterisks(float);

int main()

{

float avg[sizeA];

float current[sizeA];

string months[sizeA] = {"January","February","March",

"April" ,"May" ,"June" ,"July" ,

"August" ,"September" ,"October" ,

"November" ,"December" };

int month;

char option, answer;

do {

month = 0;

input(avg, current, months, month);

cout << "Please choose between g)raphical and t)abular output: ";

cin >> option;

if (option == 't' || option == 'T')

tabular(avg, current, months, month);

else if (option == 'g' || option == 'G')

graph(avg, current, months, month);

else {

cout << "\nYou typed neither of the choices. "

<< "Defaulting to graphical output." << endl;

graph(avg, current, months, month);

}

cout << "Y/y continues, any thing else quits: ";

cin >> answer;

} while (answer =='y' || answer == 'Y');

cout << endl << endl;

system("pause");

return 0;

}

void input(float avg[], float current[], string months[], int& month)

{

cout << "Enter the average rainfall for each month" << endl << endl;

cout << "Average ranifall: ";

inputArray(avg, months, month, 1);

cout << "The actual rainfall:" << endl;

cout << "What is the current month ? Please give the number of the month Jan = 0, etc. ";

cin >> month;

cout << "The current month is: " << months[month] << endl;

cout << "Enter the actual rainfall for each month, as prompted," << endl;

cout << "First for the months in the previous year: ";

inputArray(current, months, month, 2);

}

void inputArray(float a[], string months[], int month, int opt)

{

int count = 0;

do {

if (month > sizeA - 1)

month -= sizeA;

cin >> a[month];

cout << "For month " << left << setw(12) << months[month];

//display Avg only for first array

if (opt == 1)

cout << "Avg ";

cout<<"Rainfall: " << a[month] << endl;

count++;

month++;

} while (count < sizeA);//loop runs 12 times

cout << endl;

}

void tabular(float avg[], float current[],string months[],int month)

{

cout << endl;

//force numbers to display with a period and 1 decimal

cout.setf(ios::fixed);

cout.setf(ios::showpoint);

cout.precision(1);

cout << "You chose the tabular output." << endl << endl;

cout << "\t\t\tMonthly Rainfall" << endl

<< "\t\tFor the 12 Months Preceding May" << endl

<< "\tActual, Average, and Difference(= Actual - Average)" << endl;

line();

//displays the first 3 characters of each month

cout << "\t";

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

{

cout << " " << months[i].substr(0, 3) << " ";

if (i != sizeA - 1)

cout << "|";

}

cout << endl;

line();

//displays the average rainfall values

cout << "average ";

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

{

cout << " " << avg[i] << " ";

if (i != sizeA - 1)

cout << "|";

}

cout << endl;

//displays the current rainfall values

cout << "current ";

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

{

cout << " " << current[i] << " ";

if (i != sizeA - 1)

cout << "|";

}

cout << endl;

//displays the difference (current - average) rainfall values

cout << "diffs ";

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

{

float diff = current[i] - avg[i];

if (diff >= 0)

cout << " ";

cout << diff << " ";

if (i != sizeA - 1)

cout << "|";

}

cout << endl;

//displays P if previours month

cout << "P)rev yr";

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

{

if (i >= month)

cout << " P ";

else

cout << " ";

if (i != sizeA - 1)

cout << "|";

}

cout << endl << endl;

}

void line()

{

cout << "\t";

for (int i = 1; i <= 70; i++)

{

if (i % 6 == 0)

cout << "+";

else

cout << "-";

}

cout << endl;

}

void graph(float avg[], float current[], string months[], int month)

{

cout << endl;

cout << "You chose the graphical output" << endl << endl;

cout << left << setw(10) << "Rainfall"

<< " 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5"

<< left << setw(10) << "";

cout << "|\*\*\*\*|\*\*\*\*|\*\*\*\*|\*\*\*\*|\*\*\*\*|\*\*\*\*|\*\*\*\*|\*\*\*\*|\*\*\*\*|\*\*\*\*|\*\*\*\*|\*\*\*\*|\*\*\*\*|\*\*\*\*" << endl;

for (int i = 0; i < sizeA; i++) {

cout << left << setw(10) << months[i];

if (i >= month)

cout << " (Previous year)";

cout<< endl;

cout << left << setw(10) << "average";

asterisks(avg[i]);

cout << left << setw(10) << "actual";

asterisks(current[i]);

cout << endl;

}

}

void asterisks(float n)

{

for (int i = 0; i <= n \* 10; i++)

cout << "\*";

cout << endl;

}