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// LAB EXERCISE 4
// NUR ANISAH SOLEHAH A24CS0157
#define NUMOFBRAND 10
#define NUMOFYEAR 4
#include <iostream>
#include <iomanip>
#include <string>
#include <fstream>
using namespace std;

// Task 1
struct Sales {
   string brand;
   double salesPercentage[4];
   double average;
};

// Function Prototypes
void calculateAverage(Sales[], int);
int findLowest(Sales[], int);
int findHighest(Sales[], int);
void displayOutput(Sales[], int);
void displayLine();

// Task 2
void calculateAverage(Sales brands[], int size) {
   for (int i = 0; i < size; i++) {
      double sum = 0.0;
      for (int j = 0; j < 4; j++) {
         sum += brands[i].salesPercentage[j];
      }
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        brands[i].average = sum / 4.0;
    }
}

// Task 3
int findLowest(Sales brands[], int size) {
    int minIndex = 0;
    for (int i = 1; i < size; i++) {
        if (brands[i].average < brands[minIndex].average) {
            minIndex = i;
        }
    }
    return minIndex;
}

// Task 4
int findHighest(Sales brands[], int size) {
    int maxIndex = 0;
    for (int i = 1; i < size; i++) {
        if (brands[i].average > brands[maxIndex].average) {
            maxIndex = i;
        }
    }
    return maxIndex;
}

void displayLine() {
    for (int i = 0; i < 60; i++) {
        cout << "-";
    }
    cout << endl;
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}

// Task 5
void displayOutput(Sales brands[], int size) {
   int lowestIndex = findLowest(brands, size);
   int highestIndex = findHighest(brands, size);

   cout << "Percentage of Sales by Brand (2016 to 2019)" << endl;
   displayLine();
   cout << left << setw(15) << "BRAND"
      << setw(8) << "2016"
      << setw(8) << "2017"
      << setw(8) << "2018"
      << setw(8) << "2019"
      << "AVERAGE" << endl;
   displayLine();

   for (int i = 0; i < size; i++) {
      cout << left << setw(15) << brands[i].brand;
      for (int j = 0; j < 4; j++) {
         cout << setw(8) << fixed << setprecision(2) << brands[i].salesPercentage[j];
      }
      cout << fixed << setprecision(2) << brands[i].average << endl;
   }

   displayLine();
   cout << "Lowest Average of Sales Percentage: "
      << fixed << setprecision(2) << brands[lowestIndex].average << " - " <<
brands[lowestIndex].brand << endl;
   cout << "Highest Average of Sales Percentage: " << fixed << setprecision(2) <<
brands[highestIndex].average
      << " - " << brands[highestIndex].brand << endl;
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    displayLine();
}

//Task 6
int main() {
    const int MAX_BRANDS = 10;
    Sales brands[MAX_BRANDS];
    int brandCount = 0;

    ifstream inputFile("2. InputQ2.txt");
    if (!inputFile.is_open()) {
        cout << "Error: Unable to open InputQ2.txt file!" << endl;
        return 1;
    }

    // Read data from the input file
    while (brandCount < MAX_BRANDS && inputFile) {
        for (int i = 0; i < 4; i++) {
            inputFile >> brands[brandCount].salesPercentage[i];
        }
        inputFile >> ws; // Consume any whitespace before reading the brand name
        getline(inputFile, brands[brandCount].brand);
        brandCount++;
    }

    inputFile.close();

    // Calculate averages and display the results
    calculateAverage(brands, brandCount);
    displayOutput(brands, brandCount);
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    return 0;
}

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