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//grading.cpp, run under Borland C++ 5.02
//Programming Assignment - A Very Grading Problem
//using strings, functions, static variables,
// input data file, output report file
//Target Type: win32 application; Target Model: console
//author: Linda Weiser Friedman
//date compiled: October 1999.

#include <iostream>
#include <fstream>
#include <iomanip>
#include <string>
using namespace std;

//function prototypes
void PrintSummaryInfo(int, float, float, float);
void PrintReportHeadings(string, string, float, float, float, float);
void PrintColumnHeadings();
void PrintStudentLine(string, string, string, int, int, int, int, float);
void PrintaLine(int, char);
void SkipLines (int);
void indent (int);
float FindMax(float);
float FindMin(float);

ifstream infile ("a:students.dat"); //input data file
ofstream outReport ("a:report.txt"); //output text file - Report

int main (){ //variable declarations
    string id, course, semester, LastName, FirstName;
    float weight1, weight2, weight3, weight4;
    int n = 0, grade1, grade2, grade3, grade4;
    float FinalGrade, SumGrades = 0, HiGrade, LoGrade;

    if (!infile) //testing files
        cerr << "Error: could not open input file\n";
    else if (!outReport)
        cerr << "Error: could not open output file\n";
    else { //files OK - //do rest of program

        infile >> course >> semester >> weight1 >> weight2 >> weight3 >> weight4;
        PrintReportHeadings(course, semester, weight1, weight2, weight3, weight4);

        while (infile >> id >> LastName >> FirstName >> grade1 >> grade2 >> grade3
            >> grade4){
            FinalGrade = weight1*grade1 + weight2*grade2 + weight3*grade3 +
                weight4*grade4;
            PrintStudentLine(id, LastName, FirstName, grade1, grade2, grade3,
                grade4, FinalGrade);
            SumGrades += FinalGrade;
            n++;
            HiGrade = FindMax(FinalGrade);
            LoGrade = FindMin(FinalGrade);
        } //end while

        PrintSummaryInfo(n, SumGrades, HiGrade, LoGrade);
        cout << "Close console window? "; char c; cin>>c;
        return 0;
    } //end if/else from testing files
} //end main

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float FindMax(float FinalGrade){
    static float MaxSoFar = -1;
    if (FinalGrade > MaxSoFar)
        MaxSoFar = FinalGrade;
    return MaxSoFar;
}

float FindMin(float FinalGrade){
    static float MinSoFar = 150;
    if (FinalGrade < MinSoFar)
        MinSoFar = FinalGrade;
    return MinSoFar;
}

//functions for
// printing the report
void PrintStudentLine (string id, string lName, string fName, int g1, int g2,
    int g3, int g4, float FinalGrade){
    outReport << setiosflags (ios::fixed) << setprecision(2)
        << setw (11) << setiosflags (ios::left) << id
        << setw(10) << fName << setw(10) << lName
        << setiosflags(ios::right)
        << setw (5) << g1
        << setw (5)<< g2 << setw (5)<< g3
        << setw (5)<< g4 << setw (10) << FinalGrade << endl;
}

void PrintReportHeadings(string course, string semester, float w1, float w2,
    float w3, float w4){
    PrintaLine (65, ':');
    indent(19);
    outReport << "Little School of Soft Knocks\n";
    indent (23);
    outReport << "Student Grade Report" << endl;
    PrintaLine (65, ':');
    outReport << "\nSemester:  " << semester << "\nCourse:  " << course
        <<endl;
    PrintaLine (65, '.');
    outReport << "\nIn computing the Final Grade for each student, the
        following\n"
        <<"weights were used:\n"
        << setw(10) << "Grade 1" << setw(6) << w1*100 << "%\t"
        << setw(10) << "Grade 2" << setw(6) << w2*100 << "%\n"
        << setw(10) << "Grade 3" << setw(6) << w3*100 << "%\t"
        << setw(10) << "Grade 4" << setw(6) << w4*100 << "%\n";
    SkipLines(1);
    PrintaLine (65, '.');
    PrintColumnHeadings();
    PrintaLine (65, '.');
}

void PrintColumnHeadings(){
    outReport << setiosflags(ios::right) << setw (10) << "Student ID"
        << setw(10) <<"Name" << setw(10) << ' '
        << setw(20) << "Grades 1 - 4" << setw(14) <<"Final Grade" << endl;
}

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void PrintSummaryInfo(int n, float sum, float max, float min){
    SkipLines (2);
    PrintaLine (65, ':');
    SkipLines (1);
    outReport << setiosflags(ios::showpoint | ios::fixed | ios::left)
        << setw(25) << "number of students = " << n << endl
        << setw(25) << "Class Average = " << sum/n << endl
        << setw(25) << "Maximum Grade is " << max << endl
        << setw(25) << "Minimum Grade is " << min << endl;
    PrintaLine (65, ':');
}

void PrintaLine(int n, char c){
    for (int i=1; i<=n; i++)
        outReport << c;
    outReport << endl;
}

void SkipLines (int n){
    for (int i=1; i<=n; i++)
        outReport << endl;
}

void indent (int n){
    for (int i=1; i<=n; i++)
        outReport << ' ';
}

```

students.dat - Data file used for input data:

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Object-Oriented_Programming
Fall1999
0.15 0.25 0.25 0.35
123456789 Archer Lew 99 62 101 89
111111111 Bond James 100 98 99 89
101010101 Burke Amos 65 77 88 98
222222222 Chambers Pat 44 84 88 101
999999999 Chambers Diane 70 32 90 95
333333333 Clousseau Inspector 42 65 85 54
444444444 Ed Mister 88 99 77 99
666666666 Hammer Mike 88 87 98 78
111222333 Hope Matthew 89 90 80 87
777777777 Kent Clark 99 99 98 99
555555555 Kramer Cosmo 98 87 76 65
000111222 Marlowe Philip 78 76 65 67
888888888 Rockford James 89 78 87 89
444555666 Sunnydale Buffy 87 32 78 92
777888999 Wolfe Nero 100 100 99 100

```

Printout of report.txt:

.....
Little School of Soft Knocks
Student Grade Report
.....

Semester: Fall1999
Course: Object-Oriented_Programming
.....

In computing the Final Grade for each student, the following weights were used:

| | | | |
|---------|-----|---------|-----|
| Grade 1 | 15% | Grade 2 | 25% |
| Grade 3 | 25% | Grade 4 | 35% |

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| Student ID | Name | Grades 1 - 4 | | | | Final Grade |
|------------|---------------------|--------------|-----|-----|-----|-------------|
| 123456789 | Lew Archer | 99 | 62 | 101 | 89 | 86.75 |
| 111111111 | James Bond | 100 | 98 | 99 | 89 | 95.40 |
| 101010101 | Amos Burke | 65 | 77 | 88 | 98 | 85.30 |
| 222222222 | Pat Chambers | 44 | 84 | 88 | 101 | 84.95 |
| 999999999 | Diane Chambers | 70 | 32 | 90 | 95 | 74.25 |
| 333333333 | Inspector Clousseau | 42 | 65 | 85 | 54 | 62.70 |
| 444444444 | Mister Ed | 88 | 99 | 77 | 99 | 91.85 |
| 666666666 | Mike Hammer | 88 | 87 | 98 | 78 | 86.75 |
| 111222333 | Matthew Hope | 89 | 90 | 80 | 87 | 86.30 |
| 777777777 | Clark Kent | 99 | 99 | 98 | 99 | 98.75 |
| 555555555 | Cosmo Kramer | 98 | 87 | 76 | 65 | 78.20 |
| 000111222 | Philip Marlowe | 78 | 76 | 65 | 67 | 70.40 |
| 888888888 | James Rockford | 89 | 78 | 87 | 89 | 85.75 |
| 444555666 | Buffy Sunnydale | 87 | 32 | 78 | 92 | 72.75 |
| 777888999 | Nero Wolfe | 100 | 100 | 99 | 100 | 99.75 |

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number of students = 15
Class Average = 83.99