StudentTest.java

import chn.util.\*;

import java.lang.Math;

public class StudentTest {

public static void main(String[] args) {

FileInput f = new FileInput("input.txt"); // Reads data from input.txt

FileOutput o = new FileOutput("result.txt", "write"); // Writes data to result.txt

Student[] s = new Student[22]; // Array that can contain 22 students

int totalNum = f.readInt(); // Variable to count index of the array

double midExam = 0, finalExam = 0, total = 0, quiz = 0;

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

Student sTemp = new Student(); // Temporary student object

for (int j = 0; j<6; j++) { // Read 6 tokens per line

switch(j) {

case(0):

sTemp.setName(f.readToken()); // Sets name when first token is read

break;

case(1):

sTemp.setHeight(f.readDouble()); // Sets height when second token is read

break;

case(2):

sTemp.setAge(f.readInt()); // Sets age when third token is read

break;

case(3):

sTemp.setMidScore(f.readDouble());

// Sets midterm score when fourth token is read

break;

case(4):

sTemp.setFinalScore(f.readDouble());

// Sets final exam score when fifth token is read

break;

case(5):

sTemp.setQuizScore(f.readDouble());

// Sets quiz score when sixth token is read

break;

}

}

s[i] = sTemp; // add the temporary student object to the array

}

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

for (int j = i+1; j<totalNum; j++) {

if (s[i].getScore() < s[j].getScore()) {

Student temp = s[i];

s[i] = s[j];

s[j] = temp;

}

}

} // sort the array in descending order of the score (using selection sort)

// Time complexity: O(n^2), Space complexity: O(n)

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

midExam += s[i].getMidScore();

finalExam += s[i].getFinalScore();

quiz += s[i].getQuizScore();

total += s[i].getScore();

o.println(i+1 + "등 " + s[i].getName() + " 최종 점수 " + s[i].getScore() + "점");

} // Print the result

o.println("평균 중간고사 점수: " + String.format("%.3f", midExam/totalNum));

o.println("평균 기말고사 점수: " + String.format("%.3f", finalExam/totalNum));

o.println("평균 퀴즈 점수: " + String.format("%.3f", quiz/totalNum));

o.println("평균 최종 점수: " + String.format("%.4f", total/totalNum));

// compute the standard deviation

double midStd = 0, finalStd = 0, quizStd = 0, totalStd = 0;

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

midStd += Math.pow(s[i].getMidScore() - midExam/totalNum, 2);

finalStd += Math.pow(s[i].getFinalScore() - finalExam/totalNum, 2);

quizStd += Math.pow(s[i].getQuizScore() - quiz/totalNum, 2);

totalStd += Math.pow(s[i].getScore() - total/totalNum, 2);

}

midStd = Math.sqrt(midStd/totalNum);

finalStd = Math.sqrt(finalStd/totalNum);

quizStd = Math.sqrt(quizStd/totalNum);

totalStd = Math.sqrt(totalStd/totalNum);

o.println("중간고사 표준편차: " + String.format("%.3f", midStd));

o.println("기말고사 표준편차: " + String.format("%.3f", finalStd));

o.println("퀴즈 표준편차: " + String.format("%.3f", quizStd));

o.println("최종 점수 표준편차: " + String.format("%.3f", totalStd));

o.close(); // Close the output file

}

}

Student.java

public class Student {

private String name;

private int age;

private double height;

private double quizScore;

private double midScore;

private double finalScore;

Student(String name, int age, double height, double quizScore, double midScore, double finalScore) {

this.name = name;

this.age = age;

this.height = height;

this.quizScore = quizScore;

this.midScore = midScore;

this.finalScore = finalScore;

}

Student() {

}

public String getName() {

return name;

}

public int getAge() {

return age;

}

public double getHeight() {

return height;

}

public double getQuizScore() {

return quizScore;

}

public double getMidScore() {

return midScore;

}

public double getFinalScore() {

return finalScore;

}

public double getScore() {

return quizScore\*40/100 + midScore\*30/100 + finalScore\*30/100;

}

public void setName(String name) {

this.name = name;

}

public void setAge(int age) {

this.age = age;

}

public void setHeight(double height) {

this.height = height;

}

public void setQuizScore(double quizScore) {

this.quizScore = quizScore;

}

public void setMidScore(double midScore) {

this.midScore = midScore;

}

public void setFinalScore(double finalScore) {

this.finalScore = finalScore;

}

}

Input.txt

22

ABC 170 18 100 90 90

JHK 171 18 100 100 100

GHI 172 18 100 100 90

JKL 173 18 90 90 90

MNO 174 18 90 91 92

PQR 175 18 87 88 89

STU 176 18 76 87 68

VWX 177 18 98 92 85

YZA 178 18 85 86 82

BCD 179 18 59 86 100

EFG 180 18 92 93 96

HIJ 181 18 98 97 96

KLM 182 18 92 93 91

NOP 183 18 86 89 93

QRS 184 18 79 78 72

TUV 185 18 98 100 100

WXY 186 18 94 92 98

ZAB 187 18 100 95 92

CDE 188 18 97 95 92

FGH 189 18 100 100 97

IJK 190 18 100 90 70

LMN 191 18 85 95 100

Result.txt

1등 JHK 최종 점수 100.0점

2등 TUV 최종 점수 99.4점

3등 FGH 최종 점수 98.8점

4등 HIJ 최종 점수 96.9점

5등 GHI 최종 점수 96.0점

6등 ZAB 최종 점수 95.3점

7등 WXY 최종 점수 95.0점

8등 CDE 최종 점수 94.4점

9등 LMN 최종 점수 94.0점

10등 EFG 최종 점수 93.9점

11등 ABC 최종 점수 93.0점

12등 KLM 최종 점수 91.9점

13등 MNO 최종 점수 91.1점

14등 VWX 최종 점수 91.0점

15등 JKL 최종 점수 90.0점

16등 NOP 최종 점수 89.7점

17등 PQR 최종 점수 88.1점

18등 IJK 최종 점수 85.0점

19등 YZA 최종 점수 84.1점

20등 BCD 최종 점수 83.5점

21등 STU 최종 점수 76.1점

22등 QRS 최종 점수 75.9점

평균 중간고사 점수: 91.182

평균 기말고사 점수: 92.136

평균 퀴즈 점수: 90.136

평균 최종 점수: 91.0500

중간고사 표준편차: 9.971

기말고사 표준편차: 5.396

퀴즈 표준편차: 9.304

최종 점수 표준편차: 6.542