Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Class and Section \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Total Points (50 points) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Project: Compute Average, Minimum & Maximum Scores**

CSC 201 – Computer Science I

New River Community College

Problem Description:

Your English professor wants to calculate the following statistical information for several course that she/he teaches this semester.

1. Average Score
2. Maximum Score
3. Minimum Score

Since she/he knew that you are taking Java Programming class she/he wants your help.

Write a Java program to help your professor. Your program should ask the user the following information.

1. The number of courses that she/he would like to calculate the average score, maximum score and minimum score
2. The name of the course
3. The scores. Inform the user to use -1 (sentinel value) if there is no more score for that course
4. Your program should then display
   1. The course name.
   2. Number of scores for that course.
   3. The average score for that course.
   4. The minimum score for that course.
   5. The maximum score for that course.
5. Repeat steps 2, 3, and 4 for the rest of courses that she/he would like to calculate the statistical information.

**Here is a sample run:**

Please enter the number of courses that you would like to calculate the Average Score, the Minimum Score and the Maximum Score: **2**

Please enter the name of the course: **CSC 201**

Please enter a score for CSC 201 or type -1 to indicate that there is no more score for this course: **90**

Please enter a score for CSC 201 or type -1 to indicate that there is no more score for this course: **70**

Please enter a score for CSC 201 or type -1 to indicate that there is no more score for this course: **-1**

**The course name: CSC 201**

**Number of scores: 2**

**The average score: 80.0**

**The itdminimum score: 70**

**The maximum score: 90**

Please enter the name of the course: **ITD 130**

Please enter a score for ITD 130 or type -1 to indicate that there is no more score for this course: **70**

Please enter a score for ITD 130 or type -1 to indicate that there is no more score for this course: **80**

Please enter a score for ITD 130 or type -1 to indicate that there is no more score for this course: **85**

Please enter a score for ITD 130 or type -1 to indicate that there is no more score for this course: **75**

Please enter a score for ITD 130 or type -1 to indicate that there is no more score for this course: **-1**

**The course name: ITD 130**

**Number of scores: 4**

**The average score: 77.5**

**The minimum score: 70**

**The maximum score: 85**

**Analysis:**

**(Describe the purpose, processing, input and output in your own words.)**

**Purpose:** calculate average, minimum and maximum scores

**Processing:**

1. get user input for number of courses
2. Get scores for a particular score
3. set up algorithm to calculate average, minimum and maximum scores for a course
4. repeat process for the number of courses requested

**Input:**

* The input is processed using the Scanner class in java. Scanner class has nice validation check built in. This program uses a variety of validation checks such as:

1. check for integer
2. check for double
3. if number between 0 and 100

input is processed only when all validation checks are met.

**Output:**

output is presented in the console using the System.out.println() command.

**Design:**

(Describe the major steps for solving the problem.)

I started the problem in a top-down approach without separating the full program into compartments. The initial working program did not include any user input validation.

Later, the program was divided in to several compartments and two methods were created:

1. numberOfCourses()
2. getScore()

The main() method accesses those two methods mentioned above. A for loop is added to repeat the getScore() method.

**Testing: (Describe how you test this program)**

Testing and debugging were a continuous part of the program development and the program was tested incrementally at various stages.

Once the logic was developed, testing and debugging were completed for user input. The following output presents an example output from the program.

**ComputeAverageMinMax.main({ })**

**Please enter the number of courses (positive number please)!**

**2**

**Thank you! You have entered number of courses = 2**

**Please enter the name of the course:**

**CSC 201**

**Name of the courses :CSC 201**

**Please enter a score for CSC 201 or type -1 to indicate that there is no more score for this course**

**Please enter the scores between 0 and 100, enter -1 to end:**

**90**

**Please enter the scores between 0 and 100, enter -1 to end:**

**70**

**Please enter the scores between 0 and 100, enter -1 to end:**

**-1**

**The course name: CSC 201**

**Number of scores: 2**

**The average score: 80.0**

**The minimum score: 70.0**

**The maximum score: 90.0**

**-------------------------------------------------**

**Please enter the name of the course:**

**ITD 130**

**Name of the courses :ITD 130**

**Please enter a score for ITD 130 or type -1 to indicate that there is no more score for this course**

**Please enter the scores between 0 and 100, enter -1 to end:**

**70**

**Please enter the scores between 0 and 100, enter -1 to end:**

**80**

**Please enter the scores between 0 and 100, enter -1 to end:**

**85**

**Please enter the scores between 0 and 100, enter -1 to end:**

**75**

**Please enter the scores between 0 and 100, enter -1 to end:**

**-1**

**The course name: ITD 130**

**Number of scores: 4**

**The average score: 77.5**

**The minimum score: 70.0**

**The maximum score: 85.0**

**-------------------------------------------------**

**The total number of courses: 2**

**Number of scores: 6**

**The average score: 78.33**

**The minimum score: 70.0**

**The maximum score: 90.0**

How to submit your assignment

1. Login Blackboard
2. Click on Assignments on the left
3. Click on Week 5 Work folder
4. Read the instruction there and submit the following items:

* Your jar file with source code. **The jar file without the source code will not be graded.** Please use the steps given on Project 1 Instructions to create your jar file. Rename your jar file as YourName\_Project3. Suppose your name is Susan Boyd, you should rename your jar file as SusanBoyd\_Project3. **Files with wrong name will not be graded.**
* This document with answers for analysis, design and testing. Rename this document as Project3\_Yourname. Suppose your name is Susan Boyd, you should rename this document as Project3\_SusanBoyd. **Files with wrong name will not be graded.**

This document is worth 10 points and the comments in your program is worth 10 points. Working code is worth 30 points.

Grading Rubrics

|  |  |  |
| --- | --- | --- |
| Description | Possible Points | Your Score |
| Class  comments (Program description, author, and version) | 2 |  |
| Main method comments (method description, parameters and return) | 2 |  |
| Comments inside the body of the main method | 6 |  |
| Variables declaration using the naming convention | 6 |  |
| Correctly written outer loop (runs pre-defined number of times) | 6 |  |
| Correctly written inner loop (use the sentinel value to stop) | 6 |  |
| Working program without  any logical errors | 12 |  |
| Analysis | 2 |  |
| Design | 4 |  |
| Testing | 4 |  |
| Total | 50 |  |