CIS11 Course Project Part 1: Documenting the Project

Fill in the following areas (purple).

Introduction

1.1 Purpose

The program aims to display the lowest, the highest, and the average score of 5 different tests. The program will also match each grade with its letter equivalent (0 - 50 = F, 60 - 69 = D, 70 - 79 = C, 80 - 89 = B, 90 - 100 = A).

1.2 Intended Audience and Users

i hope that the program can be useful for teachers or people who need to make use of a program to calculate grades.

1.3 Product Scope

This program performs calculations and converts numbers to letters based on 5 numbers (exam results) that the user will enter at the beginning of the program. The intention is to help people who need to get information about their exams such as their average, the letter obtained, etc. Using this program, it will be much easier to do the above-mentioned task.

1.4 Reference

Source Documents for the Program Requirements and Specification

Input: The user is prompted to input the test scores

Output: Display maximum, minimum, average scores and letter grade equivalence on the console

2. Overall Description

2.1 Product Perspective

The objective of my program is to calculate and show the user the minimum, maximum, and average grade of five exam grades and at the end show the

equivalence in letters. My program will also use integers for the grades of the exams and ASCII characters for data input and output.

2.2 Product Functions

The overall description of functionality:

The grades: A subroutine will read the grades that the user chooses.

Other calculations: There will be subroutines that will calculate the minimum, maximum, and average of the grades.

Conversion: A subroutine will convert the numbers in to letters

Show results: The minimum, maximum, average and the letter corresponding to the grades will be displayed.

Technical functionality

These are the subroutines:
R_SCO = Read Scores / Grades
C_MIN = Calc. Min
C_MAX = Calc. Max
C_AVG = Calc. Average
CVT_LETT = Convert to letter
D_RES = Show result

I will also use arithmetic operations for calculations and for data input and output.

2.3 User Classes and Characteristics

Users are mainly students and teachers who need to obtain their or others' grades quickly, accurately, and efficiently. If some changes are made in the future, it can also be used by a company to make calculations about its stock, its products, its sales, or something else that involves the need to keep a count of something.

2.4 Operating Environment

The program will run in an LC-3 simulator that users can obtain through Windows or a web page. For now, the entire program is designed to be used in LC3

2.5 Design and Implementation Constraints

The limitations are related to the number of grades you can work with and also limited in the things you can do (The user will only be able to calculate the minimum, maximum, and average and perform a number-to-letter conversion).

2.6 Assumptions and Dependencies

It does not depend on anything but the LC-3 simulator. The program can only be run there.

3. External Interface Requirements

3.1 User Interfaces

Just a simple menu to give brief indications to the user of what to do.

3.2 Hardware Interfaces

No, just the simulator

3.3 Software Interfaces

LC-3 simulator only

3.4 Communications Interface

No, internet is not required for the program to work.

4. Detailed Description of Functional requirements

4.1 Type of Requirement (summarize from Section 2.2)

R_SCO:

will read the five grades / will be entered through the keyboard / will store the grades / will be integers representing the grades

C_MIN / C_MAX:

will calculate the minimum / maximum grade out of the 5 that will be entered by the user / will store the grade / will display the minimum / maximum grade / will be an integer

C_AVG:

will calculate the average of the five ratings / will store in memory / will display the average of the ratings (D_RES) / will be an integer.

CVT_LETT:

Will convert the average and number grades to a letter / (A, B, C, D, D, F) / Will display the average in letter and number (D_RES) / will display the letter grades (D_RES) / ASCII.

D_RES:

Will display all the results of the previous subroutines.

4.2 Performance requirements

I expect the program to be able to process the grades and display the results effectively.

The program should be responsive and accurate.

The subroutines should function correctly so that they can do the proper calculations.

I want my program to handle data input and output in the correct way (to cancel or take action in case the information that should be entered is not the right one).

4.3 Flow Chart OR Pseudocode.

[THE PROGRAM STARTS HERE].

1. Call `R_SCO` to read the five grades.

2. Call `C_MIN` to calculate the minimum grade.

3. Call `C_MAX` to calculate the maximum grade.

4. Call `C_AVG` to calculate the average of the grades.

5. Call `CVT_LETT` to convert numbers to letters.

6. Call `D_RES` to display the results (minimum, maximum, average, and letter grades).

(THERE WILL BE A MESSAGE WITH INSTRUCTIONS FOR THE USER)

Subroutine `R_SCO` :

- *With each grade the user enters this will be done:*
  - + Ask the user to enter a grade.
  - + Read the grade entered.
  - + Store the grade in a specific memory space.

Subroutine `C_MIN` :

- *Set the minimum grade (It will be the one stored first).*
- *For each of the remaining grades:*
  - + It will take one and will compare them.
  - + If the grade selected first is lower then update the minimum grade.
  - + It will return the smallest number it finds.

Subroutine `C_MAX` :

- *Set the maximum grade (it will be the one stored first).*
- *For each of the remaining grades:*
  - + It will take one and will compare them.

    + If the grade selected first is higher then update the maximum grade.
    + It will return the largest number it finds.

Subroutine `C_AVG` :

- *Starts a sum at 0*
- *For each of the five ratings:*
    + Add the current grade to the sum variable.
    + Find the average by dividing the sum of the total and then multiplying by 5.
    + Return the calculated average.

Subroutine `CVT_LETT` :

- *Take the calculated average (Integer) / Take the grades (Integer) as input.*
- *Compare the numbers with their letter equivalents*
    + 90 or more, the letter is 'A'.
    + 80 or more, but less than 90, the letter is 'B'.
    + 70 or more, but less than 80, the letter is 'C'.
    + 60 or more, but less than 70, the letter is 'D'.
    + 60 or less, the letter is 'F'.
- *It will return the number now converted to its corresponding letter.*

Subroutine `D_RES` :

- *Display the minimum grade (which was saved earlier in C_MIN).*
    + Letter Equivalence
- Display the maximum score (previously stored in C_MAX).
    + Letter Equivalence
- *Display the average.*
- *Letter Equivalence*

[THE PROGRAM ENDS HERE]