

CIS-11 Project Documentation

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Elseetree

Team Members:

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Project Name:

Test Score Calculator

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Part I – Application Overview

Our objective of this project is to take a series of five test scores submitted by the user of our program and automate the computation of the scores to display the minimum, maximum, and average scores provided as well as produce a letter grade from that average.

Objectives

- **Create a program with appropriate address: origination, fill, array, inputs and outputs**
- **Display minimum, maximum, average values and provide letter grade to console**
- **Use appropriate labels and comments within code**
- **implementation of subroutine calls within program**
- **Use of branching for control**
- **Management of storage allocation and overflow**
- **Include PUSH-POP operations on stack**
- **Include save-restore operations**
- **Implement the use of pointers**
- **Proper ASCII conversions**
- **Use of appropriate system call directives**

Why are we doing this?

- **Use of this program will reduce the time it takes to manually calculate test scores received in a course. With the program a student can submit their five scores and be provided the lowest, highest, average and letter grade equivalent. Without the need to manually calculate the scores submitted we also increase efficiency while reducing possible calculation errors from manual calculations.**
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Business Process

Currently the program will be made with students in mind to individually calculate test scores and provide a letter grade. Future improvements can expand this program to accept more test scores, or multiple classes. Furthermore then just individual students, the program has the potential to expand to teachers as well, where one can submit multiple students each with their own set of scores to produce the same results with a whole class.

Production Rollout Considerations

Program Tested and ran on online simulator : <https://lc3.cs.umanitoba.ca>

.asm file : CIS11_PROJECT_ELSEETREE.asm

Terminology

GET_GRADE - Reads the two digits to convert to whole number for
grade between 0 to 99

GET_LETTER - Converts number 0 to 99 to compare to associated
letter grade, A, B, C, D, or F

BREAK_INT - Converts number to back to two characters

CLEAR_REG - Clears registers and sets to zero

VALIDA - Validates if submitted character is a number

RESTART_PROG - Displays if user would like to rerun the program

Part II – Functional Requirements

- Establish User Submitted Test scores into program, five test scores used for testing will be 52, 87, 96, 79, 61
- Store Scores into array with pointer to call upon
- Calculate minimum score submitted and store result
- Function for maximum score submitted and store result
- Function to add all scores stored by user and divide by the amount of scores submitted, in this case five scores, for average, store result
- function to take new stored average and calculate the letter grade, 90-100 displays A, greater than or equal to 80 = B, greater than or equal to 70 = C, greater than or equal to = D, and else return F
- Display stored results , minimum, maximum, average, and letter grade to console

Statement of Functionality

Performance

- Input reads two characters to make one score (00 - 99)
- Converts ASCII characters into numbers
- Saves scores into array
- Loops to match number to stored letter grade score range
- Program has restart option

Part III – Appendices

Pseudo-Code

Start Program

Display for user to submit 5 Test scores between 0 and 99

For loop for five scores

user submits two digit score

convert to full number

store in array

Calculate minimum score

set minimum as first score

*loop if score is less than current minimum score then new score is new
 minimum*

Calculate maximum score

set maximum score as first score

*loop if score is more than current maximum score then new score is new
 maximum*

Calculate average

set sum of scores to zero

*loop to add all scores into sum value, total of five scores and divide by five
 to calculate average*

Display minimum, maximum, average and Letter Grade

Display if user would like to rerun program

Flow-Chart

