

Programming Design

Assignment 3 – Calculation of Scores

April 3, 2018

Objectives

Practice and get familiar with functions and arrays in C language. In this assignment you will make use of the subject matters in Chaps 4 and 5.

Problem Description

Write a program that calculates the raw scores, tuned scores and their statistics (average and standard deviation).

1. Input: Scores of assignments, midterm exam, and final exam for n students
2. Calculation: Write functions for calculation:

(a) `calculateRawScore`:

$$\text{rawScore} = \text{assignment} \times 30\% + \text{midterm} \times 30\% + \text{final} \times 40\%$$

(b) `calculateAdjScore`:

$$\text{adjScore} = \sqrt[5]{\text{rawScore}^2} \times 12 + 25$$

(c) `calculateAvg` and `calculateSD`: Calculate the average and standard deviation of the above scores over n students.

$$\text{Avg} = \frac{1}{n} \sum_{i=1}^n x_i$$
$$\text{SD} = \sqrt{\frac{(x_i - \text{Avg})^2}{n}}$$

3. Output: Use a table to summarize the input scores and calculation results.

Num	Assignments	Midterm Exam	Final Exam	Raw Score	Adjusted Score
1	80	70	75	75.0	92.5
2	40	50	45	45.0	80.0
3	35	30	25	29.5	71.5
Avg	51.7	50.0	48.3	49.8	81.3
SD	20.1	16.3	20.5	18.9	8.6

4. Hint: `#define` the constants in preprocessor directives: number of student ($n = 3$) and weights (30%, 30%, and 40% for assignments, midterm exam, and final exam, respectively)

Requirements

You MUST use

1. C style!
2. I/O functions
3. Flow of control
4. Functions
5. Array

Evaluation

- Correctness: 90%
- Styling: 10%

Submission

- **2018.04.22 (degrade by 10 points for each day delay)**
- Source code (assign3.c)
 - Show your information (Name, Student ID, Dept) as comments in the beginning of your code.
 - Upload the file to iLMS.