PRF192 ASSIGNMENT

Individual Assignment: This is an individual assignment. You are not permitted to work as a group when writing this assignment.

Copying, Plagiarism: Plagiarism is the submission of somebody else's work in a manner that gives the impression that the work is your own. The FPT university treats academic misconduct seriously. When it is detected, penalties are strictly imposed.

Objectives: The general aims of this assignment are:

- To introduce how to work with text files using C
- To process formatted text files as input file.
- To investigate tokenising input using the sscanf() or strtok().
- To know how to Define the struct and create an alias using *typedef*.

Deadline: The assignent will be reviewed in the week 10.

NOTE: Make an effort to do this work. It is better to try, even if incomplete, rather than to copy code or ask for support without understanding what you are coding.

In this assignment, you will write a menu program to process the marks of the students enrolled in a subject. The marks are stored in a text file that has the format shown below.

```
Code|CSEPRG
Title|Programming
FieldCount|3
F|20|10|70
StudentCount|26
S|18447565|VANDERGRAFF     |T  | 74.0 | 42.5 | 57.0 |
S|18907347|MARS            |V  | 80.5 | 60.0 | 72.0 |
S|18981993|FENNEL          |WG | 77.5 | 55.0 | 69.0 |
S|18983070|ECHOLLS         |L  | 69.0 | 40.0 | 71.0 |
S|18930300|KANE            |DS | 65.0 | 47.5 | 80.0 |
S|18915430|KANE            |L  |  0.0 |  0.0 | 34.0 |
S|18917104|NAVARRO         |EW | 58.0 | 35.0 | 66.5 |
S|18928929|CASABLANCAS     |D  | 50.5 | 57.5 | 64.0 |
S|18982917|CASABLANCAS     |C  | 88.5 | 62.5 | 87.5 |
S|18971724|COOK            |J  | 61.0 | 37.5 | 63.5 |
S|18982863|MANNING         |M  | 51.5 | 52.5 | 79.0 |
S|18928875|GANT            |C  | 66.5 | 32.5 | 43.0 |
S|18927829|HAMILTON        |Y  | 69.0 | 35.0 | 48.0 |
S|18963759|TOOMBS          |F  | 83.0 | 60.0 | 74.0 |
S|18917386|DAMATO          |L  | 56.5 | 70.0 | 73.0 |
S|18961542|LAMB            |D  | 87.0 | 42.5 | 74.0 |
S|18130217|WEIDMAN         |C  | 25.0 | 57.5 | 86.0 |
S|18966580|CLEMMONS        |V  | 46.5 | 32.5 | 77.5 |
S|18934516|VAN LOWE        |V  | 71.0 | 17.5 | 74.5 |
S|18933190|MCCORMACK       |C  | 71.5 | 77.5 | 70.5 |
S|18930122|POMEROY         |S  | 57.0 | 57.5 | 78.0 |
S|18940511|SINCLAIR        |M  | 75.5 | 65.0 | 60.5 |
S|18927590|GOODMAN         |W  | 89.5 | 70.0 | 84.5 |
S|18529509|MORAN           |C  | 51.0 | 30.0 | 77.5 |
S|18965595|GRIFFITH        |H  | 76.0 | 50.0 | 49.0 |
S|18933014|FITZPATRICK     |M  | 51.0 | 32.5 | 55.5 |
```

The first line, beginning with Code, identifies the subject code.

• The second line, beginning with Title, identifies the name of the subject.

• The third line, beginning with FieldCount, identifies the number of assessment components (or assessment tasks) used in the subject.

• Thefourth line, beginning with F, contains the percentage weight for each assessment component (e.g. the first component in the example is worth 20/100, the second 10/100 and the third 70/100).

• The fifth line, beginning with StudentCount, identifies how many students' marks the file contains.

• All the remaining lines each identify a student (and start with an S). A student's line has their student number, their family name, their initials, and then a mark for each assessment component. Note all component marks are out of 100.

• The tokens in each line are separated by the vertical bar ('|') symbol.

Your task is to write a menu program including the operations:

1. Read file: Read the given text file and display a message when the file is read successfully.
2. Print the list of students: Print all the students of the subject along with all their mark components.
3. Print the number of students: Calculate the final mark for each student and store it in an array named finalMarks. The marks are rounded to the nearest integer. The marks in the array finalMarks must correspond to the students in the array students. Note that the final mark of a student is calculated as

$$\sum_{k=0}^{n} \mathbf{mark}_k * \mathbf{fieldWeight}_k * \mathbf{0.01}$$

where n is number of fields.

4. Write Report: show the following information as follows for the example input file for the subject CSEPRG:
   - The highest mark
   - The lowest mark
   - The average mark
   - A histogram of the subject CSEPRG is:

   0- 9:
   10-19:
   20-29:*
   30-39:
   40-49:*
   50-59:****
   60-69:**********
   70-79:********
   80-89:**
   90-99:
   100:

   The histogram shows the number of students with a final mark in the given range. For example, the following line from the histogram:

   50-59:****

   means four students received marks from 50 to 59 inclusive.
5. Quit: exit the program.