ITCS 201 – Fundamentals of Programming
Lecture 14: Lab Assignments
(Submit via PC^2)

Q1: Write a program that defines a structure to store student information shown in Table 1. In particular, you must first define a structure that can store ID, Name, Gender, Midterm, and Final. Then you initialize an array of such structure with the student information shown in Table 1. Finally, you print out the student information to a terminal.

Note
- There is **NO** input in this exercise.
- The score must be printed with one decimal place.

Table 1 - Scores of 1st Year Students who enrolled in the Fundamentals of Programming in 2009.

ID	Name	Gender	Midterm	Final
1	Joe	M	2.5	4.5
3	Mint	F	4	5
5	Faye	F	9	8.5
6	Dark	M	5.5	5.5

Sample inputs and outputs:
Case 1:

Input	Output	Expected screen
	1 Joe M 2.5 4.5 3 Mint F 4.0 5.0 5 Faye F 9.0 8.5 6 Dark M 5.5 5.5	1 Joe M 2.5 4.5 3 Mint F 4.0 5.0 5 Faye F 9.0 8.5 6 Dark M 5.5 5.5

Q2: Extend the program from Q1 to receive student information from a user via a terminal, instead of manual initialization in the code, and print the information of students whose total score is **greater than** the average score.

In particular, the program first receives a positive integer, n, which specifies the number of students. Then the program receives the information of each student in the following sequence: ID, Name, Gender, Midterm, and Final, respectively. All of the student's information **MUST** be stored in an array of structures (defined in Q1). Next, the program computes and prints out an average of the total scores (Midterm + Final) from all students. Finally, it prints out the information of students who have got the total scores greater than the average.

Note
- The given gender in the test case always has ONE character.
- The maximum number of characters for the student's name in the test case is 15, and there is no blank space (' ') in the name.
- The score must be printed with one decimal place.

Sample inputs and outputs:
Case 1:

Input	Output	Expected screen
3 15 Ant M 6 4.5 8 Bird F 9 10 9 Yahoo B 10 0	13.2 8 Bird F 9.0 10.0	3 15 Ant M 6 4.5 8 Bird F 9 10 9 Yahoo B 10 0 13.2 8 Bird F 9.0 10.0

Case 2:

Input	Output	Expected screen
5 99 Name1 M 0 10 99 Name1 M 0 10 99 Name1 M 0 10 99 Name1 M 0 10 99 Name1 M 0 10	10.0	5 99 Name1 M 0 10 99 Name1 M 0 10 99 Name1 M 0 10 99 Name1 M 0 10 99 Name1 M 0 10 10.0

Q3: Write a program that utilizes the structure of structure to store student information:

- Name (e.g., Jane, June, etc.)
- Gender (e.g., M and F)
- Weight (e.g., 65.7, 70.2, etc.)
- Height (e.g., 151.7, 167.5, etc.)
- Date of birth (e.g., 17/5/1999, 3/7/1998)

The date of birth **MUST** be kept in a structure consisting of day, month and year. You **MUST** modify the given file, named `struct_func.c` to create this program. The given file also requires you to implement **TWO** functions to receive and print out student information from and to the terminal. You will receive a ZERO score if your code does not satisfy the requirements above.

Input: `<name> <gender> <weight> <height> <day> <month> <year>`
Output: `<name> (<gender>) w=<weight> h=<height> dob=<day>/<month>/<year>`

Note
- The maximum number of characters for the student's name in the test case is 15, and there is no blank space (' ') in the name.
- The weight and height must be printed with one decimal place.

Sample inputs and outputs:

Input	Output
3 Jane M 55.5 167.5 17 5 1999 June F 64.7 157.8 1 1 2000 Look M 84.3 162.5 5 12 1999	Jane (M) w=55.5 h=167.5 dob=17/5/1999 June (F) w=64.7 h=157.8 dob=1/1/2000 Look (M) w=84.3 h=162.5 dob=5/12/1999
Expected screen	
3 Jane M 55.5 167.5 17 5 1999 June F 64.7 157.8 1 1 2000 Look M 84.3 162.5 5 12 1999 Jane (M) w=55.5 h=167.5 dob=17/5/1999 June (F) w=64.7 h=157.8 dob=1/1/2000 Look (M) w=84.3 h=162.5 dob=5/12/1999	

Q4: Modify the Q3 to read the input from a given file, named `input.txt`, instead of the terminal. When you submit the PC2 for this question, you **MUST** also add the `input.txt` as an additional file, such that the PC2 can read the input from the file.

Note: There is **NO** input in this exercise as the input is from the `input.txt` file.

input.txt

```
7
Jane M 55.5 167.5 17 5 1999
June F 64.7 157.8 1 1 2000
Look M 84.3 162.5 5 12 1999
Akara M 67.5 179.5 1 1 1999
Jidapa F 285.5 123.5 31 12 1242
Pilailuck F 42 42 5 5 1989
Lufy M 100 100 8 1 4242
```

Sample inputs and outputs:

Input	Output
	Jane (M) w=55.5 h=167.5 dob=17/5/1999 June (F) w=64.7 h=157.8 dob=1/1/2000 Look (M) w=84.3 h=162.5 dob=5/12/1999 Akara (M) w=67.5 h=179.5 dob=1/1/1999 Jidapa (F) w=285.5 h=123.5 dob=31/12/1242 Pilailuck (F) w=42.0 h=42.0 dob=5/5/1989 Lufy (M) w=100.0 h=100.0 dob=8/1/4242

Expected screen
Jane (M) w=55.5 h=167.5 dob=17/5/1999 June (F) w=64.7 h=157.8 dob=1/1/2000 Look (M) w=84.3 h=162.5 dob=5/12/1999 Akara (M) w=67.5 h=179.5 dob=1/1/1999 Jidapa (F) w=285.5 h=123.5 dob=31/12/1242 Pilailuck (F) w=42.0 h=42.0 dob=5/5/1989 Lufy (M) w=100.0 h=100.0 dob=8/1/4242