**MA4830 – Realtime Software for Mechatronic Systems**

**Minor Assignment Report**

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**1. Overview of the Program**

In this program, we first created our own structure variables called ‘person’ to store the relevant information as shown in program listing. After that, on top of the main function, we created 5 functions for specific purposes, including *f\_getinfo, f\_advice, f\_input\_check, f\_reset\_check, f\_table*.

There are several features in this program that we would like to highlight. This program allows multiple attempts and it will store all the previous data in an array.Hence, it can be said that it supports multiple user for the program. We created an array of structure variable ’person’ (e.g. data) in the beginning of the main function. When the user decides to end the program, all the data and corresponded outputs will be displayed together in a table using f\_table function.

Besides that, the program also support reset and reboot function. It means that whenever the user input the trigger keys (e.g. reset -> ‘R’, reboot -> ‘X’), the program will react according to the trigger key input. For reset mode, the program will clear the current user data and restart the program. For reboot mode, the program will clear all the user data including previous user and restart the program.

**2. Main Function**

Refer to Fig. 2 (Flow Chart of Main Function) and program listing.

**3. f\_getinfo Function**

The f\_getinfo function is to collect the information required for the program. More details could refer to Figure 3 (Flow Chart of f\_getinfo Function) and program listing.

**4. f\_input\_check Function**

The f\_input\_check function is to check if the user input is valid. In this program, we only require numerical input. As a result, the function will check each character of the input to see if it is number or decimal point.

**5. f\_reset\_check Function**

The f\_reset\_check function changes the reset\_mode or reboot\_mode variables according to the trigger key entered by the user.

**6. f\_advice Function**

The advice function takes in the pointer of array named ‘data’ as input argument. The array consists of a collection of structure variable ‘person’. As referring to the Fig.2, the advice function first computes the BMI value. Then it will categorize the weight status of the input user and compute weight change recommendation according to the BMI value condition. The upper limit of normal weight category and overweight category is defined from the input argument. After that, the function will print the relevant result.

**7. f\_table Function**

Refer to the program listing and Fig. 2 (Flow Chart of Main Function) for details. As you can notice from Fig. 2, the table function is called multiple times in a for-loop to generate multiple rows of data outputs. When the for-loop counter j equals to n-1 (n is the while loop counter of main function, which indicates the number of users), this means that we have printed out all the users’ result and the table function will generate the weight status category table at the bottom as shown on Fig. 1.

A screenshot of a cell phone

Description generated with very high confidence

*Figure 1: Screenshot of the table generated at the end of program*

A screenshot of a cell phone

Description generated with high confidence

*Figure 2: Flow Chart of Main Function*

A close up of a logo

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*Figure 3: Flow Chart of f\_getinfo Function*

A screenshot of a cell phone

Description generated with high confidence

*Figure 4: Flow Chart of f\_advice Function*