ASSIGNMENT 1

PROGRAMMING TECHNIQUE 1 (SECJ1013)

SECTION 07, SEM 1 (2024/2025)

INSTRUCTIONS TO THE STUDENTS

- *This assignment must be done **in pairs** (a group consisting of a maximum of two members).*
- *Find your group member/partner, write it down, and propose your topic/calculator name in the following link: **Group Formation and Topic Proposal**.*
- *Refer to the examples of applications provided in the following link as a guide to design your solution (flow chart): **Calculator Application Examples**.*
- *Any form of plagiarisms is **STRICTLY PROHIBITED**. Students found copying from others will receive **ZERO** marks (both the student who copied and the one who shared their work).*
- *Include **your name, your partner's name, matric numbers, and the date** in your assignment solution.*

SUBMISSION PROCEDURE

- *The assignment is due by **October 28, 2024, Monday (00:00 MYT)**.*
- *Only one submission per group is required, and it must include one file (the flow chart as a **PDF file**).*
- *Submit the assignment through the UTM's e-learning system.*

Question

1. Choose a topic or calculator from the following link: **https://www.calculator.net/sitemap.html**. Each group must select a different calculator. Marks will be deducted if your group selects the same calculator as another group. The selection of calculators is on a first-come, first-served basis.

2. Based on your chosen topic or calculator, analyze the problem or application and design its solution using a **flowchart**. The flowchart must be created using suitable drawing tools such as Microsoft Visio, draw.io, or Lucidchart.

3. Suppose you choose to develop a Basal Metabolic Rate (BMR) Calculator to estimate the amount of energy expended while at rest in a neutrally temperate environment. This state is referred to as a post-absorptive state, which means the digestive system is inactive (requiring about 12 hours of fasting). **Figure 1** illustrates an example of the BMR calculator application that you can use as a reference when developing your own BMR calculator. **Figure 2** provides an example of the output that can be produced by a C++ program. The values highlighted in bold are those entered by the user.

4. Please ensure that your solution (flowchart) includes the following components:

   (a) Branching/ selection (if..else): Utilize selection to manage different pathways based on conditions.

   (b) Loop/ repetition (repeat..until/ do..while) : Use repetition to handle scenarios requiring repeated input or processes.

   (c) User-defined function flowchart: In addition to the main flowchart, your solution must include at least **ONE** additional function flowchart. Ensure appropriate arguments are used for the function.

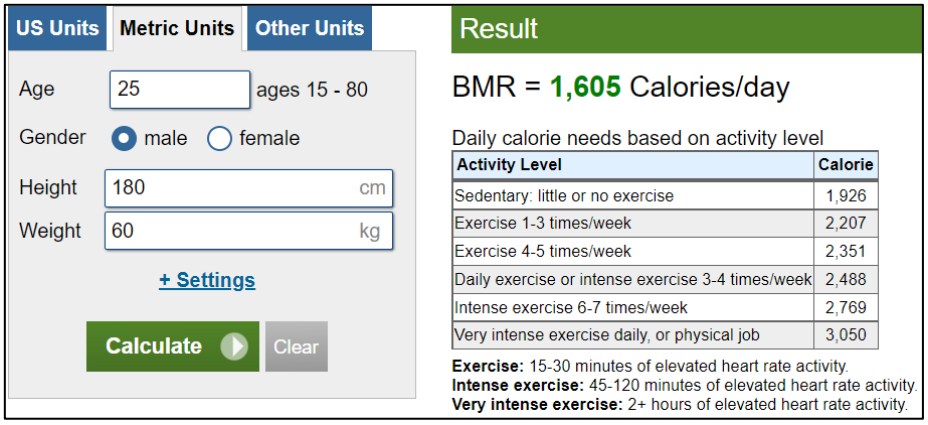

Figure 1: BMR calculator application
(***Source:*** *https://www.calculator.net/bmr-calculator.html*)

```
Basal Metabolic Rate (BMR) Calculator

Age [15-80]: 84
Age [15-80]: 10
Age [15-80]: 25
Gender [F @ M]: w
Gender [F @ M]: f
Height (cm): 180
Weight (kg): 60

BMR = 1439.00 Calories/ day (using Mifflin-St Jeor Equation)

Daily calorie needs based on activity level

Activity Level                                    Calorie
Sedentary: little or no exercise                  1,727
Exercise 1-3 times/week                           1,979
Exercise 4-5 times/week                           2,108
Daily exercise or intense exercise 3-4 times/week 2,230
Intense exercise 6-7 times/week                   2,482
Very intense exercise daily, or physical job      2,734

Exercise: 15-30 minutes of elevated heart rate activity.
Intense exercise: 45-120 minutes of elevated heart rate activity.
Very intense exercise: 2+ hours of elevated heart rate activity.

Do you want to enter other data? [Y @ N]: n

Thank you :)
```

Figure 2: The example of inputs and outputs