

ASSIGNMENT 1
PROGRAMMING TECHNIQUE 1 (SECJ1013)
SECTION 02, SEM 1 (2023/2024)

INSTRUCTIONS TO THE STUDENTS

- This assignment must be done **in pairs** (a group consisting of 2 members).
- The application examples given in the figure in the question set can be used as a guide to design your solution (flow chart).
- Any form of plagiarisms is **NOT ALLOWED**. Students who copied other students' assignments will get **ZERO** marks (both parties, students who copied, and students that share their work).
- Please insert your **name and partner's name, matrices number, and date** as a comment in your program.

SUBMISSION PROCEDURE

- Due date for this assignment is on **November 1, 2023, Wednesday**.
- Only one submission per pair (group) that includes one file is required for the submission which is the flow chart (the file with the extension .pdf).
- Submit the assignment via the UTM's e-learning system.

SET 1

Based on the problem given below, analyze the problem and design its solution using a **flow chart**. The flow chart must be drawn by using any appropriate drawing tools such as Microsoft Visio, draw.io (<https://app.diagrams.net/>), and Lucid chart (<https://www.lucidchart.com/pages/examples/flowchart-maker>). You need to develop a Basal Metabolic Rate (BMR) Calculator to estimate a basal metabolic rate: the amount of energy expended while at rest in a neutrally temperate environment, and in a post-absorptive state (meaning that the digestive system is inactive, which requires about 12 hours of fasting) (**Source:** <https://www.calculator.net/bmr-calculator.html>). **Figure 1** shows the example of the BMR calculator application as a guide to developing your own BMR calculator.

The screenshot shows a BMR calculator application with the following components:

- Unit Selection:** Three tabs at the top: "US Units" (selected), "Metric Units", and "Other Units".
- Input Fields:**
 - Age: 25 (with a range of ages 15 - 80)
 - Gender: ☒ male, ☐ female
 - Height: 180 cm
 - Weight: 60 kg
- Buttons:** "+ Settings", "Calculate" (green), and "Clear" (grey).
- Result Section:**
 - BMR = 1,605 Calories/day**
 - Daily calorie needs based on activity level**
 - | Activity Level | Calorie |
|---|---------|
| Sedentary: little or no exercise | 1,926 |
| Exercise 1-3 times/week | 2,207 |
| Exercise 4-5 times/week | 2,351 |
| Daily exercise or intense exercise 3-4 times/week | 2,488 |
| Intense exercise 6-7 times/week | 2,769 |
| Very intense exercise daily, or physical job | 3,050 |
 - 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.

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

Please take note that in your solution (flow chart), you **MUST** apply:

- a) Branching/ selection (if..else)
- b) Loop/ repetition (repeat..until/ do..while)
- c) User-defined function flow chart. Besides the **main** function flow chart, your solution needs to design at least **ONE** more other function flow chart. Use appropriate arguments for the function.

SET 2

Based on the problem given below, analyze the problem and design its solution using a **flow chart**. The flow chart must be drawn by using any appropriate drawing tools such as Microsoft Visio, draw.io (<https://app.diagrams.net/>), and Lucid chart (<https://www.lucidchart.com/pages/examples/flowchart-maker>). You need to develop a Loan Calculator to estimate a monthly installment and to help you to plan your finances. **Figure 2** and **Figure 3** show the example of Proton and Perodua loan calculator applications as a guide to develop your own loan calculator.

Vehicle	X70	▼
Variants	Standard 2WD	▼
Paint Type	Solid	▼
Region	Peninsular Malaysia	▼
Terms (In-years)	5 years	▼
Price	94800.00	
Down Payment	9,480	
Interest Rate (%)	3.5	
Insurance Premium	00.00	
Please get your insurance premium amount from your preferred insurance partner.		
Monthly Installment : RM 1,670.85		

Figure 2: Proton loan calculator application
(*Source:* <https://www.proton.com/en/shopping-tools/loan-calculator>)

LOAN CALCULATOR

(OTR Price Without Insurance)

1. Select Your Ride

Select Car Model

Ativa

Aruz

Bezza

Axia

Alza

Myvi

Select Car Variant

Myvi 1.5L AV (A.S.A. 2.0) (Auto) ▼

Select Location

Peninsular Malaysia ▼

2. Loan Details

OTR Price

RM52,697

Deposit Amount

RM5,270

Figure 3: Perodua loan calculator application
(Source: <https://www.perodua.com.my/loan-calculator.html>)

Please take note that in your solution (flow chart), you **MUST** apply:

- Branching/ selection (if..else)
- Loop/ repetition (repeat..until/ do..while)
- User-defined function flow chart. Besides the **main** function flow chart, your solution needs to design at least **ONE** more other function flow chart. Use appropriate arguments for the function.