

ASSIGNMENT 2
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).
- Your program must follow the input and output as required in the text and shown in the examples. You must test the programs with (but not limited to) all the input given in the examples.
- Any form of plagiarisms is **NOT ALLOWED**. Students who copied other students' programs will get **ZERO** marks (both parties, students who copied, and students that share their work).
- Please insert your **name and partner's name, matrix number, and date** as a comment in your program.

SUBMISSION PROCEDURE

- Please submit this assignment no later than **November 23, 2023, Thursday**.
- Only one submission per pair (group) that includes one file is required for the submission which is the source code (the file with the extension .cpp).
- Submit the assignment via the UTM's e-learning system.

SET 1

Based on the problem given below, write a complete C++ program. 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). The program should produce the outputs as in **Figure 1**. **Note:** The values in **bold** are input by the user. **Figure 2** shows the example of the BMR calculator application as a guide to developing your own BMR calculator.

```
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 1: The example of inputs and outputs

The screenshot shows a BMR calculator application. On the left, there are input fields for Age (25), Gender (male selected), Height (180 cm), and Weight (60 kg). Below these fields are buttons for '+ Settings', 'Calculate', and 'Clear'. On the right, the 'Result' section displays 'BMR = 1,605 Calories/day'. Below this, a table titled 'Daily calorie needs based on activity level' lists various activity levels and their corresponding calorie needs. At the bottom of the result section, there are definitions for 'Exercise', 'Intense exercise', and 'Very intense exercise'.

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 2: BMR calculator application

(Source: <https://www.calculator.net/bmr-calculator.html>)

Please take note that in your program, you **MUST** apply:

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

SET 2

Based on the problem given below, write a complete C++ program. You need to develop a Loan Calculator to estimate a monthly installment and to help you to plan your finances. The program should produce the outputs as in **Figure 3**. **Note:** The values in **bold** are input by the user. **Figure 4** and **Figure 5** show the example of Proton and Perodua loan calculator applications as a guide to develop your own loan calculator.

Proton Car Loan Calculator

Model [1-X50, 2-Exora, 3-Persona]: **3**

Variants [1-1.6L Standard CVT, 2-1.6L Premium CVT]: **2**

Region [1-Peninsular Malaysia, 2-East Malaysia]: **1**

Car Info

Model: Persona

Variant: 1.6L Premium CVT

Region: Peninsular Malaysia

Paint Type: Metallic

Price (MYR): 54600.00

Down Payment (MYR): **5460**

Interest Rate (%): **3.5**

Repayment period (in years): **9**

MONTHLY INSTALLMENT (MYR) : 598.33

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

Thank you :)

Figure 3: The example of inputs and outputs

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 4: 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 5: Perodua loan calculator application
(Source: <https://www.perodua.com.my/loan-calculator.html>)

Please take note that in your program, you **MUST** apply:

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