

# Bonus Exercise 2

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## Case Study: SmartHome Energy Solutions

SmartHome Energy Solutions helps households manage their electricity consumption by monitoring daily energy usage based on the number of active appliances and their average power rating. Households may wish to calculate their energy consumption over multiple days to plan and optimize their electricity usage for the week. The following energy usage guidelines apply:

<b>Appliances with Power Rating Below 500W</b>	1.5 kWh per hour of usage
<b>Appliances with Power Rating Between 500W and 1500W</b>	3.0 kWh per hour of usage
<b>Appliances with Power Rating Above 1500W</b>	5.0 kWh per hour of usage

### Question 1

Based on this information, **design an algorithm** with module that:

- i. Continuously calculates daily energy consumption for a specified number of days.
- ii. Validates the input power rating of the appliance:
  - Only accept values between 100W and 3000W.
  - Display an error message and prompt the user again if the power rating is out of range.
- iii. Prompts once for the power rating of the appliance and the number of hours it is used per day, which remain constant throughout the period.
- iv. Outputs the total energy consumption for each day, and at the end, displays the cumulative energy consumption over all specified days.

Expected output:

```
Enter power rating of the appliance (W): 1200
Enter number of hours used per day: 6
Enter number of days: 2

Energy consumption for day 1: 18.0 kWh
Energy consumption for day 2: 18.0 kWh
Total cumulative energy consumption for 2 days: 36.0 kWh
```

## Question 2

Based on the case study in **Question 1**, develop a **flowchart with a module** to illustrate the step-by-step process of calculating total energy consumption. The flowchart should prompt the user to input their information as the following output:

Example output:

```
Name: Azman bin Kasim
Address: No 2, Jalan Senai, 23000 Perak
Mobile No: 0144112301

Enter power rating for appliance (W): 300
Enter number of hours used per day: 6
Enter number of days: 5

Total Energy Consumption: 45.0 kWh
Thank you
```

## Question 3

Construct a **C program** to display the user details and calculate the total energy consumption for one (1) appliance over a specified period.