TUTORIAL 1-3 (SECJ1013)

PROGRAMMING TECHNIQUE 1

SECTION 04 & 07, SEM 1, 2024/2025

Q#1

Write a pseudocode or design a flowchart for a program that converts temperature from Fahrenheit to Celsius. The program should:
- Prompt the user to input a temperature in Fahrenheit.
- Convert the temperature to Celsius using the formula:
$$\text{Celsius} = \frac{5}{9} \times (\text{Fahrenheit} - 32)$$
- Display the converted temperature in Celsius.

List all the inputs, processes, and outputs for this problem.

Q#2

Design a flowchart or write pseudocode for a program that calculates the Body Mass Index (BMI) of a person. The program should:
- Prompt the user for their weight in kilograms and height in meters.
- Calculate the BMI using the formula:
$$\text{BMI} = \frac{\text{weight}}{\text{height}^2}$$
- Display the BMI value and a message indicating the BMI category (underweight, normal weight, overweight, or obese) based on predefined ranges.

List all the inputs, processes, and outputs for this problem.

Q#3

Create a flowchart or write pseudocode for a program that calculates the total price of items purchased, including a discount. The program should:
- Ask the user to input the total price of the items.
- Ask the user if they have a discount coupon.
- If the user has a coupon, apply a 10% discount to the total price.
- Display the final total price after the discount.

List all the inputs, processes, and outputs for this problem.

Q#4

Write pseudocode or design a flowchart for a payroll system that calculates an employee's weekly salary, including overtime and tax deductions. The program should:
- Prompt the user to input the employee's hourly wage, number of regular hours worked, and number of overtime hours worked.
- Calculate the gross pay as follows:
  - ✓ Regular pay is calculated by multiplying the hourly wage by the number of regular hours worked.
  - ✓ Overtime pay is calculated by multiplying the hourly wage by 1.5 and then multiplying by the number of overtime hours.
- Calculate the net pay by deducting 20% in taxes from the gross pay.
- Display the gross pay, the total tax deducted, and the net pay.

List all the inputs, processes, and outputs for this problem.

Q#5

Write pseudocode or create a flowchart for a college admission program that determines whether an applicant is eligible for admission based on multiple criteria. The program should:
- Prompt the user to input the applicant's high school GPA, SAT score, and the number of extracurricular activities.
- Evaluate the eligibility for admission as follows:
  - ✓ If the GPA is 3.5 or higher and the SAT score is 1200 or higher, the applicant is admitted regardless of extracurricular activities.
  - ✓ If the GPA is between 3.0 and 3.49, and the SAT score is between 1000 and 1199, the applicant is considered based on extracurricular activities.
  - ✓ If the number of extracurricular activities is 3 or more, the applicant is admitted; otherwise, they are denied.
- Display whether the applicant is admitted or denied.

List all the inputs, processes, and outputs for this problem.

Q#6

Design a flowchart or write pseudocode for a loan eligibility checker. The program should prompt the user for their annual income, credit score, and the number of years they have been employed. Based on the following conditions, the program should decide if the user is eligible for the loan:
- If the income is less than RM30,000, the user is automatically denied.
- If the income is at least RM30,000 but less than RM50,000, the user must have a credit score of 700 or higher and at least 3 years of employment.

- If the income is RM50,000 or more, the user qualifies as long as they have a credit score of 650 or higher and 2 or more years of employment.

The program should output whether the user is approved or denied for the loan based on these conditions.

Q#7

Create a flowchart or write pseudocode for a restaurant's meal price calculation. The program should prompt the user for their order type: "breakfast," "lunch," or "dinner." Based on the meal type, the program should then ask if they want a drink:
- If breakfast is selected, drinks cost RM2.
- If lunch is selected, drinks cost RM3.
- If dinner is selected, drinks cost RM4.
- The program should then ask if the user wants dessert. Dessert costs RM5 regardless of the meal type.

The final output should show the total price of the meal, which includes the base meal price (breakfast: RM10, lunch: RM15, dinner: RM20) and any additional charges for drinks and dessert.

Q#8

Design a flowchart or write pseudocode for an inventory management system in a store that allows the user to add items and calculate the total value of items in stock. The program should first ask for the number of items. For each item, the program should prompt the user for the item name, price per unit, and quantity in stock. The system should validate the input so that the price and quantity are non-negative values. Finally, the program should output a list of items with their total value (price × quantity) and the overall total value of the entire inventory.

Input Validation: Do not accept negative numbers for the price or quantity.

Q#9

Create a flowchart or write pseudocode for a program that manages bank transactions over several days. The program should first ask for the number of days. For each day, the program should prompt the user for the number of transactions. For each transaction, the user should enter the transaction type ('deposit' or 'withdraw') and the transaction amount. The program should calculate and display the final account balance after all transactions are processed.

Input Validation: The number of days and transactions must be greater than zero. The transaction amount must be positive, and the account balance should never go negative.