Case study 1

Electric Usage Charges:

Create a pseudocode based on the calculation on the electric charges bills restricted to below conditions:

- The user will input the voltage, determine what the voltage level based on below Table 1

| VOLTAGE LEVEL* | SUPPLY VOLTAGE |
|---|---|
| **Low Voltage**<br>Single Phase<br>Three Phase | Extra Low Voltage<br>(V ≤ 50V)<br>Low Voltage<br>(50V < V ≤1kV) |
| **Medium Voltage** | Medium Voltage<br>(1kV < V ≤ 50kV) |
| **High Voltage** | High Voltage<br>50kV < V ≤ 230kV<br>Extra High Voltage<br>230kV < V |

**Table 1:** Voltage Level

- Calculate the Bill Based on the Table 2 below

| | TARIFF CATEGORY | UNIT | CURRENT RATE (1 JAN 2018) |
|---|---|---|---|
| | Tariff A - Domestic Tariff | | |
| | For the first 200 kWh (1 - 200 kWh) per month | sen/kWh | 21.80 |
| | For the next 100 kWh (201 - 300 kWh) per month | sen/kWh | 33.40 |
| 1. | For the next 300 kWh (301 - 600 kWh) per month | sen/kWh | 51.60 |
| | For the next 300 kWh (601 - 900 kWh) per month | sen/kWh | 54.60 |
| | For the next kWh (901 kWh onwards) per month | sen/kWh | 57.10 |

**Table 2**: Electricity Tariff

- Any less than RM 3.00 is free, therefore the output of Bill is RM 0.00
- Take input from file CS1.txt. The text file contains the User names, voltage inputs and Total Consumptions for 10 users. Display all data input from CS1.txt like below format.

Output form

| Name | Voltage | Voltage Level | Total Consumption | Bill |
|---|---|---|---|---|
| Adila Firdaus | 1500Kv | Extra Hight Voltage | 300 | RM 77.00 |

.
.
.

Case study 2

Create a pseudocode based on the calculation on BMI restricted to below conditions:

- User in put Weight(KG) and Height(CM) that could not be negative value
- A BMI range of 25.0 to 29.9 is overweight, while the healthy range is 18.5 to 24.9. Below the range is underweight and If your BMI is above 30: Your BMI is considered obese. Output the BMI status
- Output the Weight reduction in Kilogram to make the BMI in healthy range status if the BMI is Overweight or Obese.
- Take input from file CS2.txt. The text file contains the User names, weight and height for 10 users. Display all data input from CS2.txt like below format.

Output form

| User | Weight | Height | BMI | BMI status | Weight Reduction |
|---|---|---|---|---|---|
| Adila Firdaus | 60kg | 151cm | 26.6 | overweight | 4kg |

.
.
.

Case study 3

Create a pseudocode based on the calculation on Airplane Ticket price restricted to below conditions:

- The user starts with fill up the Departure Date in this format. Day : (Monday to Sunday), Year: (2020-2022), Month: (1-12), Date(1-28,30,31). Any value out or range is invalid
- The price rate is as below Calculate the price based on the destination entered:

| Destinations | From (MYR) |
|---|---|
| Bandar Seri Begawan | 1,499 |
| Manila | 1,899 |
| Phnom Penh | 2,099 |
| Siem Reap | 1,909 |
| Hanoi | 1,129 |

**Table 3**: Airplane Ticket price fare

- Check the date enter. If it less than one week from 5$^{TH}$ November 2020 then the price will be double from the price listed in Table 3.
- Take input from file CS3.txt. The text file contains the User names, Day, Year, Month, Date of Departure and Destinations for 10 users. Display all data input from CS3.txt like below format.

Output form

| User | Destination | Day | Date | Ticket Price |
|---|---|---|---|---|
| Adila Firdaus | Manila | Tuesday | 10$^{th}$ November 2020 | RM3798 |

.
.
.

Case study 4

Create a pseudocode based on the calculation on Employee Payroll salary restricted to below conditions:

- The user inserts the Hours/Day, Days in a month and Months must be in round and positive numbers. Meanwhile the Hours are not allowed more that 24 hours, Days more that the exceeded number of the input month (for example: Month in February could not more than 29 days) and Months not more than 12.
- Then the user must insert roles. Any roles that is not listed in Table 4 is not valid. The salary rate is based on the roles of the User input as below:

| Role | Rate |
|---|---|
| Clerk | RM15/hour |
| Manager | RM35/hour |
| Assistant Manager | RM30/hour |
| Officer | RM20/hour |
| Intern | RM500 if not less than 160 hours. If less then, RM0.00 |

**Table 4**: Salary Rate based on Roles

- The salary formula is Hours x Days x Rate
- Take input from file CS4.txt. The text file contains the User names, Hours/Day, Days, and roles for 10 users. Display all data input from CS4.txt like below format.

Output form

| User | Hours/Day | Days | Role | Salary |
|---|---|---|---|---|
| Adila Firdaus | 10 hours | 29 days | Assistant Manager | RM8700 |

.

.

.

Case study 5

Create a pseudocode based on the calculation on Student grades restricted to below conditions

- The user must input the Marks based on each type of Assessment : Q1, Q2,Q3, Project 1, Project 2, Assignment 1, Assignment 2, Midterm, Final. The Marks must be positive and not more than 100.
- The Distribution Percentage of each Type of Assessment are listed below. Calculate the total Marks based on the input marks for each assessment.

| Assessment | Percentage (%) |
|---|---|
| Quiz (Q1 to Q3) | 9 |
| Project (Project 1 and Project 2) | 30 |
| Assignment (Assignment 1 and Assignment 2) | 16 |
| Midterm | 15 |
| Final | 30 |

**Table 5**: Percentage Distribution for each Type of Assessment

- Below is the Grade based on Marks. Output the Grade based on the calculated marks

| Marks | Grade | Point |
|---|---|---|
| 90 - 100 | A+ | 4.00 |
| 80 - 89 | A | 4.00 |
| 75 - 79 | A- | 3.67 |
| 70 - 74 | B+ | 3.33 |
| 65 - 69 | B | 3.00 |
| 60 - 64 | B- | 2.67 |
| 55 - 59 | C+ | 2.33 |
| 50 - 54 | C | 2.00 |
| 45 - 49 | C- | 1.67 |
| 40 - 44 | D+ | 1.33 |
| 35 - 39 | D | 1.00 |
| 30 - 34 | D- | 0.67 |
| 00 - 29 | F | 0 |

**Table 6**: Grading Table

- Take input from file CS5.txt. The text file contains the User names, : Q1, Q2,Q3, Project 1, Project 2, Assignment 1, Assignment 2, Midterm, Final for 10 users. Display all data input from CS5.txt like below format.

Output form

| User | Q1 | Q2 | Q3 | Project 1 | Project 2 | Assignment 1 | Assignment 2 | Midterm | Final | Full Marks | Grade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Adila Firdaus | 1.80 | 1.80 | 1.80 | 9.00 | 9.00 | 4.80 | 4.80 | 9.00 | 18.00 | 60.00 | B- |

.
.
.

Case study 6

Create a flowchart based on the analysis on the Weather report restricted to below conditions

- The user will input the Amount of rain daily for a week and the system will calculate the average rain amount of the week and which day is has the highest amount of rain.
- If the amount is more than 230 Litre, its means that it floods and the difference will add up to the next day. Then, the system will also output how many days flood happen in the week
- If there is no rain for three days in a row, the system will notify that there is drought in which days in the week.
- Take input from file CS6.txt. The text file contains the Week number and the amount of rain daily for a week for 10 weeks. Display all data input from CS6.txt like below format.

Output form

| Week | Status | Flood(Day) | Drought. |
|---|---|---|---|
| 1 | Drought and 2 day(s) Flood | 5,6 | 2,3,4 |
| 2 | No Drought and 1 day(s) Flood | 1 | - |

Case study 7

Create a flowchart based on the calculation on the Charity Eligibility restricted to below conditions:

- The user will input how many persons in a family. The number must be in round numbers and not negative. If more than 10, the system will reconfirm with the user.
- The user will start inserting the salary of the head of family and other family members salaries. Then, the users will insert household expenses and expense for each member. The salaries and expenses must be in money format and not negative.
- If the total salaries are more than total expenses, then they are not eligible to accept charity. If the total salaries are less than total expenses but the total expenses divided by number of members more than RM1500.00, also not eligible for charity.
- If total expenses less that total salaries and the total expenses divided by number of members less than RM1500.00, but the household expenses is more than 50% of the total expenses also not eligible for charity.
- If one of the member expenses more than RM 2000, also not eligible for charity.
- If none of the condition met, the system will calculate the charity amount based on the amount needed to cover the expenses compare to the earned salaries and limit to RM2000 only.

- Take input from file CS7.txt. The text file contains the User names, each member(3 members per user) salaries, household expenses and each member(3 members per user) salaries total expenses for 10 users. Display all data input from CS7.txt like below format.

Output form

| User | Total Salary | Total House Expenses | Total Members' Expenses | Total Expenses | Eligibility |
|---|---|---|---|---|---|
| Adila Firdaus | RM4000 | RM1500 | RM3500 | RM5000 | Not Eligible |
| Suraya | RM5000 | RM2400 | RM2500 | RM4900 | Not Eligible |

.
.

Case study 8

Create a flowchart based on the calculation of Summon fees restricted to below conditions

- The user will input the type of Summons based on table below. Any other type is not acceptable

| Summons Type | Summons Fees (RM) |
|---|---|
| Parking | 40 |
| No Entrance Pass | 50 |
| Do not wear Matric Card | 65 |
| Wearing Shorts | 65 |
| Cheating during Exam | 100 |

**Table 7**: Summons Fees

- The user will also input time of Summons (24HRS system. Example: 10 pm is 2200). If the time is after or before office hour (8 am-5pm). The fees will be doubled from Table 7.
- Then the input the date of summons and the date of payment in this format. Day : (Monday to Sunday), Year: (2020-2022), Month: (1-12), Date(1-28,30,31). Any value out or range is invalid
- If the difference is not more than or 2 days, the fees will be discounted for 30% off.
- Take input from file CS8.txt. The text file contains the User names, Summons time, Day and date summons, Day and date payment and Summons type for 10 users. Display all data input from CS8.txt like below format.

Output form

User Summons Type Time Day Summons Date Summons Day Payment Date Payment Summons Fees (in one line)

Adila Firdaus Parking 2200 Sunday 1st November 2020 Monday 2nd November 2020 RM 28.00 (in one line)

.

.

Case study 9

Create a flowchart based on the calculation of Point of Sales system restricted to below conditions

- The user will input the Item Id and the amount per item based on the price on Table 8 below the Item ID must between 1-5 and amount must be round numbers, positive and not more than 20:

| Item ID | Summons Fees (RM) | Price (RM)/unit |
|---|---|---|
| 1 | Apple | 3.40 |
| 2 | Honey Dew | 5.20 |
| 3 | Pencil Box | 2.20 |
| 4 | Tissue Box | 6.00 |
| 5 | Pen | 3.90 |

**Table 8**: Price List

- If the amount of price of each item is RM20.00, then 10% off that item price.
- If the total amount is more than RM100, then 15% off from the full amount.
- If the user buy at least 5 item of each of all items, then the user will get 15% discount.
- If the purchase fulfills at least two conditions above, the final amount will be the highest total amount following one of the conditions.

- Take input from file CS9.txt. The text file contains the User names, Item id for three items and amount for each item id for 10 users. Display all data input from CS9.txt like below format.

Output form

| User | Item 1 | Price | Item 1 | Price | Item 1 | Price | Total Amount |
|---|---|---|---|---|---|---|---|
| Adila Firdaus | Apple | RM30.60 | Pencil Box | RM11.00 | Pen | RM7.80 | RM49.40 |

.
.

Case study 10

Create a flowchart based on the Bank Transaction system restricted to below conditions

- The user will input the amount of account balance in money format. Negative is allowed.
- The user will input one of the menu selections as stated below. Any other input, system will prompt the menu again. However, If the balance is less than or – RM150, then the menu no 2 and 4 will not be prompted.
    - 1-Check balance
    - 2-Withdrawal
    - 3-Insert money
    - 4-Loans
    - 5-Terminate
- If the user input is 1, the system will display account balance in money format. Then, the menu is prompted again based on the previous condition
- If the user input is 2, The user will input the withdrawal amount. However, if the balance is less than or -RM150, the system will not allow for the withdrawal and state the maximum withdrawal is the amount of account balance. Then, the menu is prompted again
- If the user input is 3, the user will input the currency and the amount that the user wants to add. Then the system converts based on the currency exchange below and add up to account in RM. Any other currency is invalid. Then, the menu is prompted again
    - RM1= USD 0.24
    - RM1= 272.77 Won
    - RM1= 25.08 Yen
    - RM1= SGD 0.33
    - RM1= £ 0.19 (Pound Sterling)
- If the user input is 4, the users will input the amount that amount of loan (number must be round, not negative and not less than RM10,000) and years (number must be round, not negative and not more than 10 years for RM10,000 to RM30,000 and up to 30 years for RM30,001 and above) of loan. If the total amount of the current account balance multiply with the number of months of loan years is more than the amount of loan, then the loan is approved. If not, the loan is not approved. Then, the menu is prompted again
- If the user input is 5, the system will end.

- Take input from file CS10.txt. The text file contains the User names, account balance, the withdrawal, the insertion, the insertion currency, amount of loan and year of loan for 10 users. Display all data input from CS10.txt like below format. The balance amount after withdrawal and insertion calculation.

Output form

| User | Balance | Loan | Loan Year | Loans Status |
|---|---|---|---|---|
| Adila Firdaus | RM300 | RM40000 | 11 | Rejected |
| Suraya | RM100 | N/A | N/A | N/A |

Case study 11

Create a pseudocode based on the Hotel Room payment system restricted to below conditions

- The user will insert the number of guest hotel. Then the age of each guest. The input must be round numbers, not negatives. If the age is more than 15 years old then its consider adult guests
- Then the user must choose which room that he/she prefers based on Room ID on table below. Any other input will not be accepted

| Room ID | Room Name | Price (RM)/night | Room Load |
|---|---|---|---|
| 1 | Apple | 300.00 | Max adult:1<br>Max Children:1 |
| 2 | Honey Dew | 510.00 | Max adult:3<br>Max Children:3 |
| 3 | Mango | 450.00 | Max adult:2<br>Max Children:3 |
| 4 | Rose | 330.00 | Max adult:1<br>Max Children:2 |
| 5 | Hibiscus | 750.00 | Max adult:4<br>Max Children:5 |

**Table 9**: Hotel Price List

- If the Room Id load is less than the number of adult and children load, then the system will no allow for room reservation.
- Then the user will have to input the number of nights. The input must be round numbers, not negatives
- Lastly the system will display the total amount of room payment which include the total payment plus tax (6% of total payment) plus RM100/guest in one night as deposits (For example the user input 3 adult guest, 2 children guest and pick Honey Dew for 3 night, therefore the deposits is 5xRM100x3nights=RM1500)
- Take input from file CS11.txt. The text file contains the User names, the number of adults, the number of children, room ID, the number of nights for 10 users. Display all data input from CS11.txt like below format.

Output form

| User | No of Adult | No of Children | Room Name | Nights | Deposit | Total Amount |
|---|---|---|---|---|---|---|
| Adila Firdaus | 2 | 2 | Honey Dew | 2 | RM800 | RM1881.20 |
| Suraya | 2 | 2 | Apple | 2 | N/A | N/A |

Case study 12

Create a pseudocode based on the Hotel Room payment system restricted to below conditions

| Type | Diagnostic Test | Value for Normal | Value for Prediabetes | Value for Diabetes |
|---|---|---|---|---|
| 1 | Hemoglobin A1C (HbA1C) | V < 5.7 | 5.7 <= V < 6.5 | V ≥ 6.5 |
| 2 | Fasting plasma glucose (FPG) | V < 100 | 100 <= V < 125 | V ≥ 125 |
| 3 | Oral glucose tolerance test (OGTT) | V < 140 | 140 <= V < 200 | V ≥ 200 |

**Table 10**: Hotel Price List

- The user will enter the Value (V). Then the system will determine which type, The Diagnostic Test and the state of the patient either Normal, Prediabetes and Diabetes. If the value is for type 1, it can be in float type but for value that round numbers must be for type 2 and 3.
- If the patient state is Prediabetes, state the amount of value to reduce to Normal state based on the type
- If the patient state is Diabetes, state the amount of values to reduce to Prediabetes and Normal state based on the type
- Take input from file CS12.txt. The text file contains the User names, and the value for 10 users. Display all data input from CS12.txt like below format.

Output form

| User | Value | Type | Diagnostic Test | State | Value to reduce |
|---|---|---|---|---|---|
| Adila Firdaus | 20.9 | 1 | HbA1C | Diabetes | 14.4 |
| Suraya | 115 | 2 | FPG | Prediabetes | 16 |

.

Case study 13

Create a flowchart based on the Tax rebate calculation restricted to below conditions

- The user needs to insert the amount of salary each month for a year
- The total tax is 8% for each amount of monthly salaries for a year.
- Then the system will rebate of amount of tax based on Tax rebate item in Table11 below. Any other input will not be accepted

| Tax Rebate ID | Tax Rebate Item | Amount of rebate(RM) |
|---|---|---|
| 1 | Zakat | Full amount |
| 2 | Life choice | 25% than the amount price |
| 3 | Books/Magazine/Newspaper | 5% of each price per unit |
| 4 | Hospitality | 45% of the total amount |
| 5 | School Fees | 20% of total amount |

**Table 11**: Hotel Price List

- Calculate the rebate amount but the amount could not exceed 85% of the total tax. If that happens, the rebate amount is 85% of total tax.
- Take input from file CS13.txt. The text file contains the User names, monthly salary, three items id and the amount price per item for 10 users. Display all data input from CS13.txt like below format.

Output form

| User | Full Tax | Item 1 | Amount | Item 2 | Amount | Item 3 | Amount | Total Rebate |
|---|---|---|---|---|---|---|---|---|
| Adila Firdaus | RM6720 | Zakat | RM5000 | Life Choice | RM250 | School Fees | RM550 | RM5712 |

.

.