UTM

UNIVERSITI TEKNOLOGI MALAYSIA

(SECJ1013) PROGRAMMING TECHNIQUE I

SEM 1, SESSION 2023/2024

LAB EXERCISE 1

SECTION 03

Name	Matric Number
TAN ZHI MING	A23CS0189

(SECJ1013) PROGRAMMING TECHNIQUE 1

SEM 1, SESSION 2023/2024

LAB EXERCISE 1

INSTRUCTIONS TO THE STUDENTS

- This exercise must be done **individually**.
- Any form of plagiarism is **NOT ALLOWED**. Students who copied other students' assignments will get **ZERO** marks (both parties, students who copied, and students who shared their work).
- Please insert your **name and matric number** as a comment in your solution.

SUBMISSION PROCEDURE

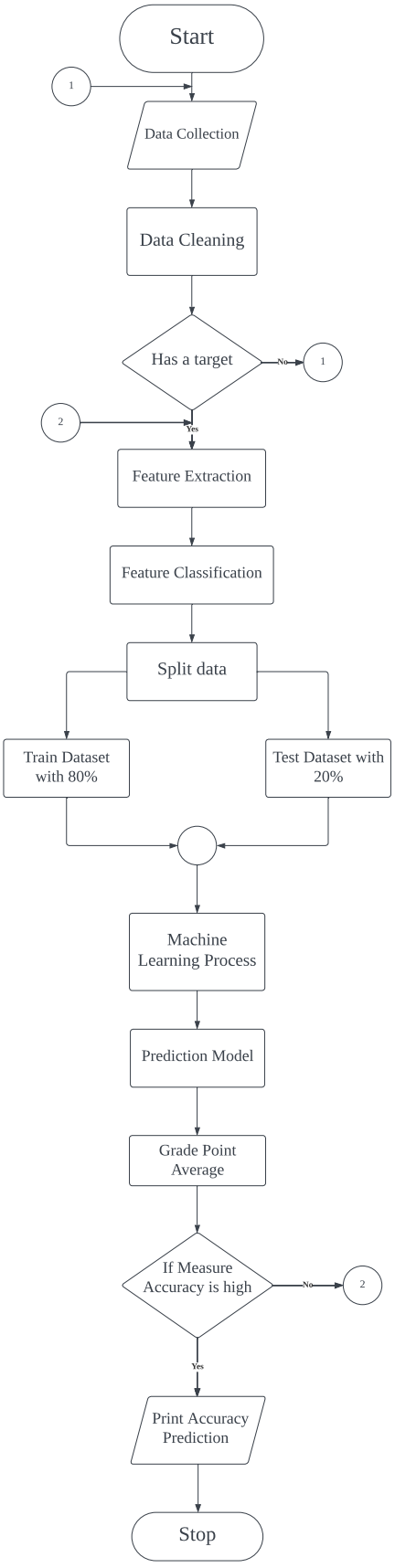
- Please submit this exercise no later than **October 22, 2023, Sunday (17:00 MYT)**.
- Only one file is required for the submission (the file with the extension **.pdf**).
- Submit the assignment via the UTM's e-learning system (https://elearning.utm.my/23241/).
- Note: Draw your flowchart using any appropriate drawing tools such as Microsoft Visio, Lucid chart (https://www.lucidchart.com/pages/examples/flowchart-maker), and draw.io (https://app.diagrams.net/).

SET 1

Construct a flowchart based on the pseudocode below.

***Hint**: The **bold fonts** show the keywords that need to be included in the flowchart.*

1. **Start**
2. **Data Collection** is to collect data
3. **Data Cleaning** is to prepare the collected data
4. If it **has a target** from the data
   4.1 Yes, go to **Feature Extraction**
   4.2 No, go to Data Collection
5. Feature Extraction is used to extract the specific data used for prediction
6. **Feature Classification** is to classify the data used to predict performance
7. **Split Data** is to split data into 80% training datasets and 20% test datasets
   7.1 **Train Dataset with 20%**
   7.2 **Test Dataset with 80%**
8. **Machine Learning Process** is used for creating a model of machine learning algorithms
9. **Prediction Model** is to create a model for certain purposes
10. Evaluation Model (e.g., **Grade Point Average**) is to evaluate the predicted model
11. During **Measure Accuracy**, if Accuracy is high
    11.1 Yes, go to Display result **Accuracy Prediction**
    11.2 No, go to Feature Extraction
12. **End**


Start
1
Data Collection
Data Cleaning
Has a target
No
1
2
Yes
Feature Extraction
Feature Classification
Split data
Train Dataset with 80%
Test Dataset with 20%
Machine Learning Process
Prediction Model
Grade Point Average
If Measure Accuracy is high
No
2
Yes
Print Accuracy Prediction
Stop

SET 2

Construct a pseudocode based on the case study below.

PT1 Hotel offers two rental packages to customers. The following is the rental cost for each package:

Package	Rental Price per Night (RM)
Weekday	150
Weekend/ Public Holiday	250

Customers must pay a deposit of 10% of the rental cost before placing an order. Customers who are regular customers receive a 10% discount. Complete the following pseudocode, which prompts users to enter their name, length of stay, package (1 - Weekday, 2 - Weekend/ Public Holiday), and customer type (Regular or Normal). The pseudocode should calculate and display the customer's name, deposit payment, total discount given (if any), and the remaining rental cost to be paid.

```
1. Start
2. deposit = 0.10
3. Get the name, duration, package, customer_Type
4. If package == 1
4.1     rental = 150
5. else
5.1     rental = 250
6. End If
7. If customer_Type == Regular
7.1     discount = 0.1
8. else
8.1     discount = 0.0
9. End If
10. price = rental * duration
11. deposit_Payment = deposit * price
12. total_Discount = discount * price
13. balance = price – deposit_Payment – total_Discount
14. Display name, deposit_Payment, total_Discount, balance
15. End
```

```
SET 2
// TAN ZHI MING A23CS0189
```

SET 3

Construct a pseudocode that reads an integer number and then calculates the product of its digits. After that, identify whether the product of digits for the integer is a multiple of 4, 5, and/ or 7. ***Hint:*** You should use the operator divide (/) and modulus (%) and also **pre-test loop** to answer this question.

Example 1

Enter an integer number: **9212**

9 * 2 * 1 * 2 = 36

36 is a multiple of 4

Example 2

Enter an integer number: **61145**

6 * 1 * 1 * 4 * 5 = 120

120 is a multiple of 4 and 5

Note: The number in **bold** shows input entered by the user.

SET 3

1. Start
2. Initialize num , product = 1 , divided4=0 , divided5=0 , divided7=0 , last_digit , total, c =0;
3. Display "Enter a number"
4. Read num
5. numLength = length of num (converted to a string)
6. arrayLength = numLength
7. Initialize array with arrayLength element
8. while num != 0
    8.1 last_digit = num % 10
    8.2 product = product * last_digit
    8.3 array[arrayLength - 1] = last_digit
    8.4 arrayLength = arrayLength - 1
    8.5 num = num/10
9. End while
10. for i = 0 until i = (numLength - 2)continue this loop
    10.1 Display array[i] , " * "
11. End for
12. Display array[arrayLength - 1] , " = " , product
13. if product divided by 4 , then set divided4 = 4
14. End if
15. if product divided by 5 , then set divided5 = 5
16. End if
17. if product divided by 7 , then set divided7 = 7
18. End if
19. total = divided4 + divided5 + divided7
20. If total is 4, then:
    20.1 Display product, " is a multiple of 4"
21. Else, if total is 5, then:
    21.1 Display product, " is a multiple of 5"
22. Else, if total is 7, then:
    22.1 Display product, " is a multiple of 7"
23. Else, if total is 9, then:
    23.1 Display product, " is a multiple of 4 and 5"
24. Else, if total is 11, then:
    24.1 Display product, " is a multiple of 4 and 7"

25. Else, if total is 12, then:
    25.1 Display product, " is a multiple of 5 and 7"
26. Else, if total is 16 ,then:
    26.1 Display product, " is a multiple of 4, 5, and 7"
27. Else
    27.1 Display product , " is not a multiple of 4, 5, and 7"
28. End if
29. End

```
SET 3
// TAN ZHI MING A23CS0189
```

Click here to enter text.

SET 4

Construct a flowchart that reads an integer number and then calculates the product of its digits. After that, identify whether the product of digits for the integer is an even or odd number, and a multiple of 3, and/ or 5. ***Hint:*** You should use the operator divide (/) and modulus (%) and also the **post-test loop** to answer this question.

Example 1

Enter integer number: **256**

2 * 5 * 6 = 60

60 is an even number and multiples of 3 and 5

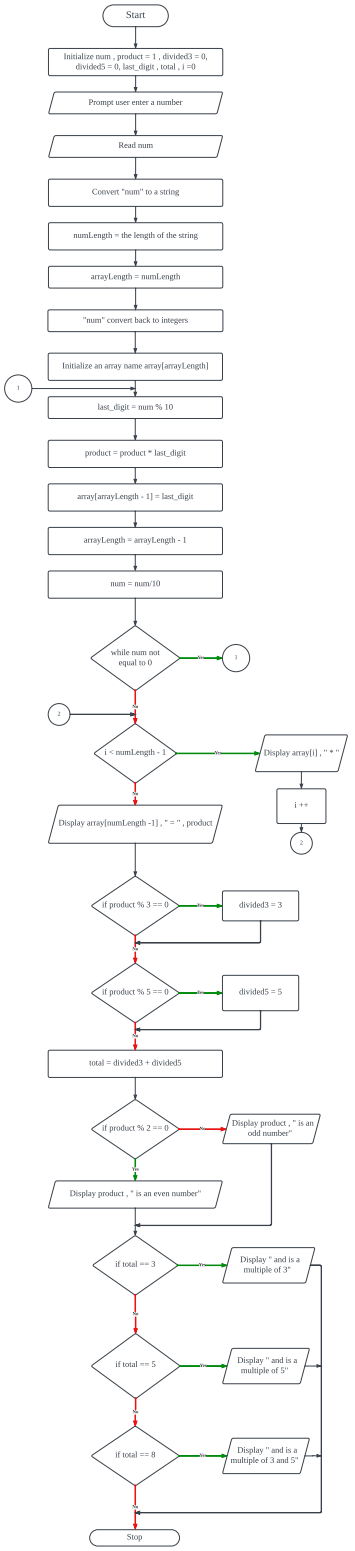
Example 2

Enter integer number: **7442**

7 * 4 * 4 * 2 = 224

224 is an even number

Note: The number in **bold** shows input entered by the user.


Start
Initialize num , product = 1 , divided3 = 0, divided5 = 0, last_digit , total , i =0
Prompt user enter a number
Read num
Convert "num" to a string
numLength = the length of the string
arrayLength = numLength
"num" convert back to integers
Initializ an array name array[arrayLength]
1
last_digit = num % 10
product = product * last_digit
array[arrayLength - 1] = last_digit
arrayLength = arrayLength - 1
num = num/10
while num not equal to 0
yes
1
no
2
i < numLength - 1
yes
Display array[i] , " * "
i ++
2
no
Display array[numLength -1] , " = " , product
if product % 3 == 0
yes
divided3 = 3
no
if product % 5 == 0
yes
divided5 = 5
no
total = divided3 + divided5
if product % 2 == 0
yes
Display product , " is an odd number"
no
Display product , " is an even number"
if total == 3
yes
Display " and is a multiple of 3"
no
if total == 5
yes
Display " and is a multiple of 5"
no
if total == 8
yes
Display " and is a multiple of 3 and 5"
no
Stop