NOTE:

- **Create a folder on Desktop to save your works.**

- **Use comment // to write your name, ID, Group and Lab Question in each program.**

- **Save your file as .c**

REMINDER!
Save your program as C language, not C++ (cpp).

LAB OBJECTIVES

At the end of this lab activity, the students should be able to:

- Create a complete user-defined function (function prototype, function call and function definition)
- Pass values from one function to another function
- Use any built-in function if necessary.

QUESTION 1

Write a program to perform mathematical operation based on user's choice.

- In *main()*:
  - Display the menu.
  - Call function *get_choice()* to get user's input for mathematical operation to perform.
  - Prompt the user for two integer numbers.
  - Call function *calculate(…)* and pass the numbers and the choice.

- In *get_choice()*:
  - Ask the user to enter his/her choice.
  - Use a *loop* to make sure the user enters the correct value for choice (while the entry/choice is wrong, ask the user to re-enter the value).
  - Return the choice to *main()*.

- In *calculate(…)*:
  - Use a ***switch-case*** statement to perform calculation on the two numbers based on the operation input by user.

    Operation A :

    answer = number 1 + number 2

    Operation B :

    answer = number 1 * number 2

    Operation C :

    answer = number 1 - number 2

    Operation D :

    answer = number 1 % number 2

    Operation E:

    answer = $number\ 1^{number\ 2}$ ***[use appropriate build-in function]***

  - Display the answer.

SAMPLE OUTPUT 1: User chose E	SAMPLE OUTPUT 2: Wrong code
A. Add numbers B. Multiply numbers C. Subtract numbers D. Remainder of numbers E. Power of numbers What is your choice? : E Enter 2 numbers : 2 3 Answer : 8	A. Add numbers B. Multiply numbers C. Subtract numbers D. Remainder of numbers E. Power of numbers What is your choice? : c Your choice is invalid. What is your choice? : d Your choice is invalid. What is your choice? : D Enter 2 numbers : 11 3 Answer : 2

QUESTION 2

Write a program to convert centimeter (cm) to inches.

Don't forget to write the function prototype

- In *main()*:
  - Call function *get_input()*.
  - Ask the user whether he/she wants to continue or not.
  - If yes, continue the process using a loop.

repeat

- In *get_input()*:
  - Prompt the user to enter a value in centimeter.
  - Then call function **cm_to_inches**(…) and pass the centimeter.

- In *cm_to_inches(…)*:
  - Convert the value in centimeter to inches:
    1 cm is 0.394 inches. Set this value as a constant using preprocessor directive.
  - Display the output as shown in the sample output.

SAMPLE OUTPUT:

```
Enter centimeter : 10
10.00 cm is equals to 3.94 inches

Continue <Y - Yes   N - No >: Y


Enter centimeter : 5.5
5.50 cm is equals to 2.17 inches

Continue <Y - Yes   N - No >: N

Program ends.
```

QUESTION 3

Write a program to calculate total amount of fees need to be paid for subjects' registration.

- In main():
  - Prompt the user to enter number of subject to register.
  - Maximum subjects to register is 3. While/if the user input more than 3:
    - Display the appropriate message
    - and prompt the user again to key in the correct value. (use ***while*** loop)

while

  - Repeat the following process using **for** loop based on **the number of subjects** that the user entered earlier:
    - Ask the user to enter the subject code.
    - Call function *get_credit_hour(…)* to get the credit hour and pass the subject code.
    - Calculate the fee based on the cost per credit hour (RM150) and the number of credit hours for one subject (returned by *get_credit_hour(…)* function).

fee for one subject = RM 150 X subject credit hours

    - Calculate total fee for all the subjects registered.
    - Then call function *display_records(…)* and pass the subject code, credit hour and fee amount for one subject.

for

  - Display the total fees to be paid.

- In function *get_credit_hour(…)*:
  - Use *if* statement to identify the credit hours for each subject code. Use built-in function **strcmp()**.

Subject Code	Credit hour
DCS5038	4
DET5078	3
DPR5038	2

  - Return the credit hour to *main()*.

- In function *display_records(…)*:
  - Display the subject code, credit hour and fee.

SAMPLE OUTPUT 1: More than 3 subjects

```
How many subject to register: 5
Maximum number to register is 3 subjects. Please key-in again.

How many subject to register:
```

SAMPLE OUTPUT 2: 3 subjects

```
How many subject to register: 3

Subject #1
Enter the subject code    : DCS5038

Subject Code : DCS5038
Credit Hour  : 4
Total Fee    : RM 600.00

Subject #2
Enter the subject code    : DPR5038

Subject Code : DPR5038
Credit Hour  : 2
Total Fee    : RM 300.00

Subject #3
Enter the subject code    : DET5078

Subject Code : DET5078
Credit Hour  : 3
Total Fee    : RM 450.00

Total fee to be paid : RM 1350.00
```

SAMPLE OUTPUT 3: 1 subject only

```
How many subject to register: 1

Subject #1
Enter the subject code    : DET5078

Subject Code : DET5078
Credit Hour  : 3
Total Fee    : RM 450.00

Total fee to be paid : RM 450.00
```

QUESTION 4

Write a program to calculate parking charges.

- In *main():*
  - Prompt the user to input hour and minute entered into the parking lot and hour and minute left from the parking lot. User must use 24-hour format to key in the input.
  - Call function *calculateCharges(…)* and send hour and minute entered and hour and minute left as argument.
  - Call function display(…) and send the total charges as argument.

- In *calculateCharges(…)*:
  - Display number of hours and minutes the user parks his/her car.
  - The parking place charge RM1.50 for the first three hours. If a vehicle parked more than 3 hours, the place charges an additional RM1.00 per hour for each extra minutes or hour.
  - Return total parking charges to *main()*.

- In display(…):
  - Display the total charges.

SAMPLE OUTPUT 1:

```
Time in (HH) : 9
Time in (MM) : 00
Time out (HH) : 11
Time out (MM) : 00
You have parked for 2 hour(s) and 0 minute(s)
Total charges = $ 1.50
```

SAMPLE OUTPUT 2:

```
Time in (HH) : 13
Time in (MM) : 00
Time out (HH) : 16
Time out (MM) : 15
You have parked for 3 hour(s) and 15 minute(s)
Total charges = $ 2.50
```

SAMPLE OUTPUT 3:

```
Time in (HH) : 8
Time in (MM) : 00
Time out (HH) : 13
Time out (MM) : 30
You have parked for 5 hour(s) and 30 minute(s)
Total charges = $ 4.50
```