Lab 7 Functions

Please test the correctness of your program in **Q1, Q2a, Q2b and Q3** on **PASS**.

Q1.

Download `calc.cpp`. Complete the function definitions such that it computes addition, subtraction, multiplication, and division of two real numbers.

Output the result in 2 decimal places. Example inputs and outputs are as follows.

Expected Outputs:

Example-1
Enter an Expression consisting of two operands and one operator. **1+2** 3.00
Example-2
Enter an Expression consisting of two operands and one operator. **2.5-1** 1.50
Example-3
Enter an Expression consisting of two operands and one operator. **2*3** 6.00
Example-4
Enter an Expression consisting of two operands and one operator. **5/2** 2.50
Example-5
Enter an Expression consisting of two operands and one operator. **1-2.5** -1.50
Example-6
Enter an Expression consisting of two operands and one operator. **2/5** 0.40

Q2a.

Download and complete the program **printNum.cpp**, which intends to print integers in English, corresponding to user input *(range: 1 to 19)*.

The program consists of the following functions:

print1to9: accepts an integer from 1 to 9 as input and print the number in English. This function has been defined for you. *(but not 100% correct !!)*

Let's fix the bug(s) in function **print1to9**. After that, you create another function called **print10to19**. The function accepts an integer from 10 to 19 as input and prints the number in English.

The user input should be prompted in the main function. After the number is read, the appropriate functions should be called for output.

Expected Outputs:

Example-1	Example-2
Enter a number in Range [1--19]. 0 0 is not in range from 1 to 19	Enter a number in Range [1--19]. 20 20 is not in range from 1 to 19
Example-3	**Example-4**
Enter a number in Range [1--19]. 4 Four	Enter a number in Range [1--19]. 15 Fifteen

Q2b.

Modify the program in **Q2a** such that it accepts an integer (1 to 99) from the user and prints the English representation accordingly.

You should define an extra function as follows.

print20to99: accepts an integer from 20 to 99 as input and print the number in English.

> *Hint:* **You may break down the number into units digit and tens digit and call the** *print1to9* **and** *print10to19*
> **functions you defined in Q2a to generate the output.**

Similar to **Q2a,** the user input should be done in the main function. After the number is read, the appropriate function(s) should be called for printing the result.

Expected Outputs:

Example-1	Example-2
Enter a number in Range [1--99]. 0 0 is not in range from 1 to 99	Enter a number in Range [1--99]. 20 Twenty
Example-3	**Example-4**
Enter a number in Range [1--99]. 21 Twenty One	Enter a number in Range [1--99]. -21 -21 is not in range from 1 to 99

Example-5	Example-6
Enter a number in Range [1--99]. **78** Seventy Eight	Enter a number in Range [1--99]. **100** 100 is not in range from 1 to 99

Q3. [will be marked]

Download **gcd.cpp**. The program intends to find the **Greatest Common Divisor GCD** of a set of input positive integers. The Greatest Common Divisor is the largest positive integer that divides each of the integers, e.g. the GCD of {4, 6} is 2 and the GCD of {12, 24, 6} is 6.

The program saves input numbers in array **num[ ]**.

Your task is as follows:
– Complete the **gcd()** function which return the greatest common divisor of two numbers.
– Complete the loop in main function, using **gcd()** to find the greatest common divisor of all input numbers.
– Do not modify attributes in the program.

Hint: You can use Euclidean algorithm to get the GCD of two integers.

Expected Outputs:

Example-1	Example-2
Enter 5 numbers: **2 4 6 8 10** GCD: 2	Enter 5 numbers: **12 24 6 36 60** GCD: 6
Example-3	Example-4
Enter 5 numbers: **12 24 8 36 100** GCD: 4	Enter 5 numbers: **16 25 14 7 30** GCD: 1