Lab 3 Introduction to PASS, and Exercises on Operators and Basic I/O

1. Programming Assignment aSsessment System [PASS]

In this course, you will use the **PASS** system for program testing and assignment submission.

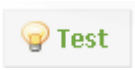
You may access **PASS** via the link in Canvas, or directly via https://pass3.cs.cityu.edu.hk
(You'll be using your CityU EID)

Select our course – **CS2311_CA1(1819 Sem.A) - Computer Programming**

Click the link "**Problem list**". 

Click the "**Test/Submit**" icon for the question you want to solve. 

You may specify source code (**.cpp** file) upload with the "**Browse**" button *(default)*, or you may paste the source code into the space provided. *(Need to select from radio button)*

To test the program *(tutorial or assignment)*, click the **Test** button. 

> *Note: Your program should follow the input and output format EXACTLY*
> *(i.e. identical spacing, new lines and letter case).*
> *Otherwise the **PASS** system will say that your program's output is incorrect.*

To submit for ***assessment***, click the ***Submit*** button. Please be reminded that only the submissions via the ***Submit*** button are counted for grading. The code in ***Test*** will NOT be considered for grading.

> *Note: After submission, **PASS** will report the output of your program versus the "expected output". Note that for assignments, the test cases for "**Test**" may not be the same as what we use for grading. (Test cases for "**Test**", which you can see when you click the Test button, are usually a subset of the complete test cases we use for grading.)*

2. Exercises on Operators and Basic I/O

NOTE: In all the following exercises, the input entered by the user is highlighted by underline. It is not part of the output from the program.

Q-1.

a) Write a program Area.cpp that the user inputs the width and height of a rectangle. The program computes and output the area of the rectangle.
Hint: Use the following formula to compute the area:

Area = Width * Height

b) Enhance the program so that the input and output of the program are as follows.
(Note: The underlined words are user input. You don't need to print it)

Expected Output:

```
Please enter the width
3
Please enter the height
5
The area is 3*5=15
```

You should test your program using **PASS**.

c) Improve the programming style of the program. This includes using:
   i) More meaningful variable name to reflect the purpose of the variable;
   ii) Indentation (use the tab character to indent and shift-tab to move back by 1 level);
   iii) Comments.

Q-2.

a) Write a program **ConvertTemperature.cpp** that read a temperature in Celsius and display it in Fahrenheit.
Hint: Use the following formula to convert Celsius to Fahrenheit:

Fahrenheit = 9 / 5 * Celsius + 32

Expected Output:

```
Enter Temperature in Centigrade:
30
Temperature in Fahrenheit is:
86
```

b) Extend the program of **part-a,** and convert calculated Fahrenheit into Kelvin.
Hint: Use the following formula to convert Fahrenheit to Kelvin:

Kelvin = (Fahrenheit + 459.67) * 5 / 9

Expected Output:

```
Enter Temperature in Centigrade:
30
Temperature in Fahrenheit is:
86
Temperature in Kelvin is:
303.15
```

You should test your program using **PASS**.

Q-3.

a) Write a program **SumOfDigits.cpp** that read a number of three digits and print the sum of digits.
Hint-1: For example, a number N = 346 the output should be 3+4+6 = 13
Hint-2, Use % and / operators.

Expected Output:

```
Please Enter a number of Three Digits:
456
Sum of Digits is:
15
```

b) Extend the program of **part-a,** that reads a number of three digits and prints the sum of square of digits.
*Hint: For example, a number N = 123 the output should be 1*1 + 2*2 + 3*3 = 14*

Expected Output:

```
Please Enter a number of Three Digits:
456
Sum of Square of Digits is:
77
```

You should test your program using **PASS**.

Q-4.

Write a program **CalculateAge.cpp** to compute the age of a person in years and months. The expected output for data entry and display output should be according to the following format.

Expected Output:

```
Enter the Current Year: 1996
Enter the Current Month (a number in range from 1 to 12): 10
Enter Your Current age in Years: 36
Enter the Month in which you were born (a number in number from 1
to 12): 5
Enter the Year for which you want to know your age: 2001
Enter the Month of Year 2001: 6

Your age in 6/2001 is : 41 years and 1 month
```

The program should cope with singulars and plurals properly in the output, e.g. "1 month" but "2 months". If the result of month is 0, "and 0 month" should not be outputted.

Hint-1: The year should be considered equal to 365 days.
Hint-2: The underline numbers are considered as inputs.

You should test your program using **PASS**.