CS001.4 - Introduction to Programming
Final Assignment

> **Instructions**
> • Submission deadline 11/12/2020.
> • A softcopy in **pdf format** should be uploaded to the LMS.
> • This Assignment is based on Flow charts, Pseudo Codes and Python Programming
> • For Python programming questions students need to add a clear screenshot
>   of the Code editor (don't copy and paste to word or text editor) and the
>   output should be displayed for the programming questions.
> • Provide your own work. Plagiarism will be strictly penalized.
> • For any further clarification please contact shashie.d@nsbm.lk

• <u>Answer all the questions.</u>

1) (i) Draw a flow chart, to take two integer inputs from user and display the answers of four basic
   arithmetic operations (+ - * /).
   (ii) Convert the above flowchart to a pseudocode.

2) A company gives discounts for the total bill paid by the customers. If the Bill amount is above Rs.
   5000/-, a discount of 10 % is given. Otherwise 5% is given. Input the Bill amount and calculate
   the discount amount.
   (i)Draw a flowchart for the above scenario
   (ii) Convert the above flowchart to a pseudocode.
   (iii) Convert the above pseudocode into a python program.

3) A company pays a basic salary of Rs. 8000/- to the salesmen. If a salesman does sales of Rs.
   50,000/- or above, he is given a 25% commission. Otherwise only 10%.
   Input the sales done by a salesman and calculate his salary for the month.
   (i) Draw a flow chart for the above scenario.
   (ii) Convert the above flowchart to a pseudocode.
   (iii) Convert the above pseudocode to a python program.

4) Write Python codes to get the following number patterns as the output (Use loops)
   (i) 3,6,9,12,15,18,21
   (ii) 20,16,12,8
   (iii) 6,16,36,76

5) (i) Write a python program to generate the following list using a for loop

Num1 →10,20,30,40,50

(ii) Print only 20,30,40 from the list created above.
(iii) Print the second last element from the above list.
(iv) Alter the above list to include '55' at the end of the list and print it.
(v) Create a separate list named 'Num2' .

Num2 →60,65,70,75,80

(vi) Merge Num1 with Num2 and name the merged list as 'Numbers'

(vii) Print the merged list in the reverse order

6) Write a program to calculate someone's age in Years, Months and Days. Get 6 user inputs from the user, 3 for Today's date (year, month and day) another 3 inputs for the user's birth day (year,month and day).

-Assume that all the months of a year have 30 days.

Example:

```
*******Current date********
Enter todays day:17
Enter todays month:8
Enter todays Year:2020
----------------------------
*******Birth date********
Enter  Birth date:20
Enter Birth month:12
Enter Birth Year:1999
----------------------------
********AGE Calculator ******·
years: 20 Months: 7 Days: 27
```

7) Write a program to Calculate the Electricity Bill of a House, when the user input the number of Units consumed in a particular month.

Charging Criterion: Tariff Block(Units)	Unit Rate(Rs.)
0<units<30	5/-
30<=units<60	20/-
60<=units<120	150/-
120<units<200	500/-
Units>=200	1000/-

Example: If the number of units consumed is 55, Charge = (29*5) + (25*20) =645/-

8) Develop a calculator for a desired operation between two numbers.

Conditions: -User chooses the operation He/ She wants.
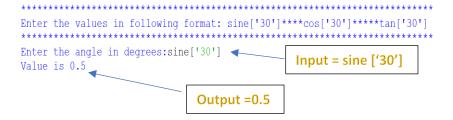-And the calculator should run repeatedly till the user wants to quit.
-if user enter, "exit" your program should terminate.

Example: -If user enter, 4+2, your program should print 6

9) This problem is based on python dictionaries. Implement 3 dictionaries for sine, cosine and tangent standard angles and values shown in the figure 1. Convert this fraction values to decimal values manually using a calculator before inserting them in dictionaries. For an example when user calls sine['30'] the program should display 0.5.

Angles in Degrees	0°	30°	45°	60°	90°
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
tan	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	Not defined

Figure 1: Standard Trigonometric Table

```
**************************************************************************
Enter the values in following format: sine['30']***cos['30']*****tan['30']
**************************************************************************
Enter the angle in degrees:sine['30']
Value is 0.5
```

Input = sine ['30']

Output =0.5

10) Write a function called **fizz_buzz** that takes a number.
If the number is divisible by 3, it should return "**Fizz**".
If it is divisible by 5, it should return "**Buzz**".
If it is divisible by both 3 and 5, it should return "**FizzBuzz**".
Otherwise, it should return the same number.

11) Write a python program to calculate the daily payment of an employee with overtime payments. The program should contain a separate function for overtime payment. calculation. When the user enters the number of worked hours per day, payment should be calculated.

Work hours: 8 am-5 pm. (9 hrs)
Normal rate: Rs 1000 per day
OT Rate: Rs 200 per hour

Ex: If the number of hours worked per day is 14, the daily payment should be
(1000+(200*5)) → Rs 2000

12) Write a function for checking the speed of drivers. This function should contain one parameter: speed.
If speed is less than 70, it should print "Ok". Otherwise, for every 5km above the speed limit (70), it should give the driver one demerit point and print the total number of demerit

points. For example, if the speed is 80, it should print: "Points: 2". If the driver gets more than 12 points, the function should print: "License suspended".