VINUNIVERSITY

Lab Practice № 2: Variables, Operators and Functions

COMP1010 Introduction to Programming **Week 02**

Lab Practice Submission Instructions:

- This is an individual lab practice and will typically be assigned in the laboratory (computer lab).
- Your program should work correctly on all inputs. If there are any specifications about how the program should be written (or how the output should appear), those specifications should be followed.
- Your code and functions/modules should be appropriately commented. However, try to avoid making your code overly busy (e.g., include a comment on every line).
- Variables and functions should have meaningful names, and code should be organized into functions/methods where appropriate.
- Academic honesty is required in all work you submit to be graded. You should **NOT** copy or share your code with other students to avoid plagiarism issues.
- Use the template provided to prepare your solutions.
- You should upload your .py file(s) to the Canvas **before the end of the laboratory session** unless the instructor gave a specified deadline.
- Submit separate .py file for each Lab problem with the following naming format: YourStudentID_Lab2_Q1.py. For example: **V202000999_Lab2_Q1.py**. **Note:** If you are working on Jupiter Notebook, you need to download/convert it to Python .py file for submission.
- Late submission of lab practice without an approved extension will incur the following penalties:

  (a) No submission by the deadline will incur 0.25 point deduction for each problem (most of the problems are due at the end of the lab session).

  (b) The instructor will deduct an additional 0.25 point per problem for each day past the deadline.

  (c) The penalty will be deducted until the maximum possible score for the lab practice reaches zero (0%) unless otherwise specified by the instructor.

Problem 1 - Assignment Operators

Given two variables `value1` and `value2`. Write a program to:

Step 1: Assign value to `value1` and `value2`, say `value1 = 12` and `value2 = 9`

Step 2: Add value of `value1` and `value2`

Step 3: Add `value1` to the output of Step 2

Step 4: Print the final result

Problem 2 - Assignment with User Input

Write a program to ask for the number of students in a class. Next, request the user to enter the total score of all students and then output the average exam score of the class. Note that Python 3 uses the `input()` method to ask user entering an input and assigning it to a variable, for example:

```
username = input("Enter username:")
```

DO NOT use a for-loop in this problem.

Problem 3 - Membership Operators

Given a list called `list = [19, 12, 3, 14, 25, 10]`. Check whether the value of `a = 10` and value of `b = 18` is available in list or not, by using `in` and `not in` operators.

The Python List `index()` method with the help of examples can be refered from `https://www.programiz.com/python-programming/methods/list/index`.

Problem 4 - Data Types

Prompt the user for two inputs and then output their sum and difference as shown in the following sample program output.

```
***This program requires two inputs***
Enter an integer:  10
Enter a float number:  0.5
Total is 10.5 , Difference is -9.5
```

What is the output if we add this line → `print(x+y)`? (where `x` and `y` are the input from user before type conversion)

Problem 5 - Geometric sequence

If a sequence is geometric there are ways to find the sum of the first n terms, denoted S_n, without actually adding all of the terms. To find the sum of the first S_n terms of a *geometric sequence*, we can use the formula

$$S_n = \frac{a(1 - r^n)}{1 - r}, r \neq 1$$

where n is the number of terms, a is the first term and r is the common ratio.

For example, S_{10} for 250, 100, 40, 16, ... is computed as follows:
$n = 10$, $a = 250$, $r = \frac{100}{250} = \frac{40}{100} = 0.4$,
$S_{10} = \frac{250(1 - 0.4^{10})}{1 - 0.4} = 416.622976$

Write a program to compute the first n terms of a *geometric sequence*. Use the following **test cases** to check your program.

      (a) S_{10} for 24, 12, 6, ... is 47.953125

      (b) S_8 for 3, -6, 12, -24, ... is -255