# Lab: Syntax Rules and Conditions

Set 2 - Selections

**Note:** Parts of this lab are adapted from S. Linge and H. P. Langtangen (2020). Licensed under the terms of the [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/deed.en) (https://creativecommons.org/licenses/by/4.0/deed.en).

## Background

Syntax refers to the rules that define the structure of a programming language, including the structure of its symbols, punctuation and words. Without syntax, it would be impossible for programmers to understand one another’s code and programs.

## Instructions

Use a Python IDE to create a solution for the scenario presented in each question.

Lab questions are designed to assess your comprehension of the course materials covered in this unit, therefore questions should be solved using **only** the programming constructs covered in the course materials to the end of Unit 2-2. Use of other programming constructs will result in a grade of 0 on the lab question.

#### GIC (Guaranteed Investment Certificates)

Write a program that asks the user to enter a GIC term in years and an amount to invest. Using the table below, select the correct interest rate based upon term and calculate and print the interest accumulated, and total amount at the end of the term. Use a simple interest calculation and assume interest is not compounded annually.

*total interest = amount \* interest rate \* years invested*

Use constant variables to hold rates. Assume only valid data is entered as inputs.

|  |  |
| --- | --- |
| Term (in Years) | Interest Rate (as Percentage) |
| 1 | 4.9 |
| 2 | 4.1 |
| 3 | 4.0 |
| 4 | 3.8 |
| 5 | 3.75 |

**Sample runs:** (inputs in bold underline)  
Run your program 3 times to produce the following output)

Enter GIC Term: **3**  
Enter amount to invest: **10000**  
Interest at end of term = $1,200.00  
Total at end of term = $11,200.00  
  
Enter GIC Term: **1**  
Enter amount to invest: **400**  
Interest at end of term = $19.60  
Total at end of term = $419.60

Enter GIC Term: **5**  
Enter amount to invest: **9999**  
Interest at end of term = $1,874.81  
Total at end of term = $11,873.81

#### Simple calculator

Create a simple calculator that can add, subtract, multiply or divide depending upon the input from the user. The output should look as displayed in the sample runs below. Depending upon the menu option chosen, you will add, subtract, multiple or divide the two numbers and will get the answers of the operation entered. On division, if 0 is entered for the divisor, print “Cannot divide by zero”

**Sample runs:** (inputs in bold underline)  
Run your program **5 times** to produce the following output)

Simple Calculator  
1. Add  
2. Subtract  
3. Multiply  
4. Divide  
Enter menu option: **1**  
Enter first number: **5.1**  
Enter second number: **1.7**  
5.1 + 1.7 = 6.8

Simple Calculator   
1. Add  
2. Subtract  
3. Multiply  
4. Divide  
Enter menu option: **2**  
Enter first number: **5.1**  
Enter second number: **1.7**  
5.1 - 1.7 = 3.3999999999999995

Simple Calculator   
1. Add  
2. Subtract  
3. Multiply  
4. Divide  
Enter menu option: **3**  
Enter first number: **5.1**  
Enter second number: **1.7**  
5.1 \* 1.7 = 8.67

Simple Calculator   
1. Add  
2. Subtract  
3. Multiply  
4. Divide  
Enter menu option: **4**  
Enter first number: **5.1**  
Enter second number: **1.7**  
5.1 / 1.7 = 3.0

Simple Calculator  
1. Add  
2. Subtract  
3. Multiply  
4. Divide  
Enter menu option: **4**  
Enter first number: **10**  
Enter second number: **0**  
Cannot divide by 0

**Submission**

For each question, submit your Python source code (.py file) and your test results (.txt file containing output from the Terminal Window after running your Python program) to the Brightspace submission folder for this assignment.

# Reference

Linge, S. and Langtangen, H. P. (2020). Programming for computations – Python: A gentle introduction to numerical simulations with Python 3.6. (2nd ed.). Springer Open. ([CC BY-SA 4.0](https://creativecommons.org/licenses/by/4.0/deed.en)). Retrieved from https://library.oapen.org/viewer/web/viewer.html?file=/bitstream/handle/20.500.12657/23103/1007055.pdf