# Lab: Syntax Rules, Conditions and Loops

Set 5 – Tuples, Dictionaries, Sets, and Formatted Output

**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 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 information provided in the course materials to the end of Unit 2-4b. Use of materials outside of this will result in 0 on the lab question.

#### Territory Population

Define a tuple for territories holding these 3 items: Northwest Territories, Yukon, Nunavut. Also define an empty dictionary.

For each entry in the tuple, read the population for that territory and then create a dictionary item using the territory name as the **key** and its population as the **value**.

Iterate through the dictionary you created, accumulating a population total and printing the report specified in the sample run below.

**Sample run:** (inputs in bold underline)  
Run your program 1 time to produce the following output.

Enter Population for Northwest Territories: **42514**  
Enter Population for Yukon: **31530**  
Enter Population for Nunavut: **31152**

Territory Population  
=============================================  
Northwest Territories 42,514  
Yukon 31,530  
Nunavut 31,152  
=============================================  
Total 105,196

#### 1st Year Course Sets

The following sets represent the 1st year courses for ITS and SD diploma programs:

ITS: CMPH-209, COMM-238, CPNT-219, CPRG-216, MATH-237, CPNT-224, CPRG-217, CPSY-204, CPSY-206, PHIL-241

SD: CPRG-213, COMM-238, CPNT-217, CPRG-216, MATH-237, CPRG-211, CPRG-250, CPSY-200, CPSY-202, PHIL-241

Write a program that defines two sets having the above members, then, using Python’s set features, determines and prints: courses common to both diplomas, courses unique to the ITS diploma, and courses unique to the SD diploma.

Note: because sets are unordered, your results may differ in order from the sample run provided.

**Sample run:** (no inputs)  
Run your program 1 time to produce the following output.

Common 1st Year Courses:

COMM-238

PHIL-241

CPRG-216

MATH-237

ITS-only 1st Year Courses:

CPRG-217

CMPH-209

CPNT-224

CPSY-206

CPSY-204

CPNT-219

SD-only 1st Year Courses:

CPNT-217

CPSY-200

CPRG-213

CPRG-250

CPSY-202

CPRG-211

**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 lab 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