Python for Absolute Beginners

Susan Sim
Lecturer
Faculty of Information
susan.sim@utoronto.ca

Agenda

- Introduction
  - Writing a First Program
- Cryptography
  - Caesar Ciphers
- Programming
  - Strings
  - Decision Structures (if/else/elif)
  - Control Structures (for)

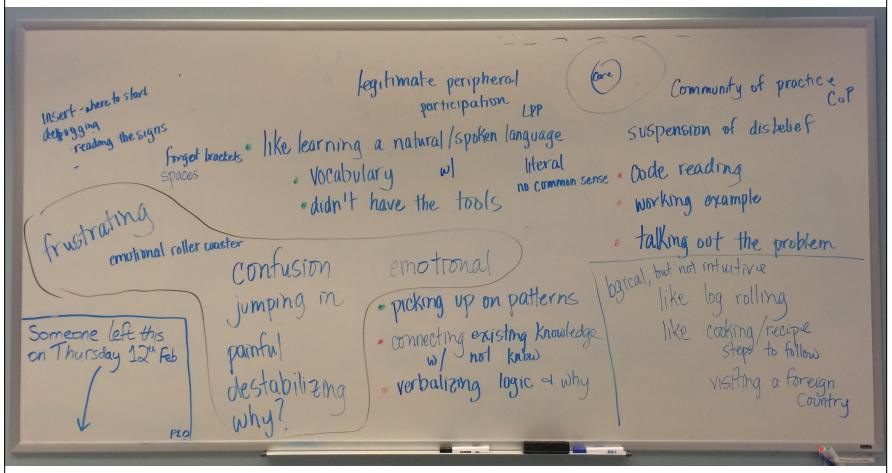
Rule 0

Don't panic.

Python

- Powerful
- Flexible
- Clean
- Easy to use and understand
  - Beginner friendly
- Named after Monty Python's Flying Circus

```
53
54    temperature = [18, 25, 4]
55    fahrenheit = [val * 9 / 5 + 32 for val in temperature]
56    celsius = [(val - 32) * 5 / 9 for val in fahrenheit]
57
58    if fahrenheit == celsius:
59        print("Same")
60    else:
61        print("Different")
62
63    for index, val in enumerate(temperature):
64        temperature[index] = val * 9 / 5 + 32
```



Rule 1

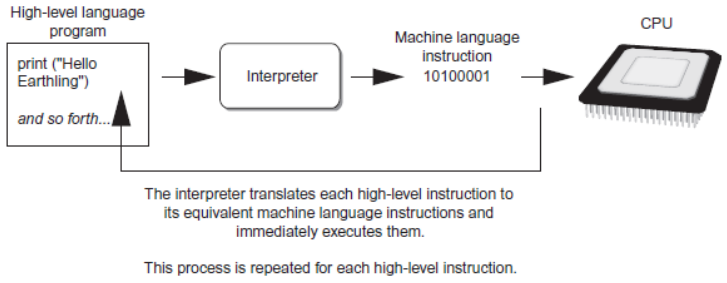
- Think before you program!

Rule 2

- A program is a human-readable essay on problem solving that also happens to execute on a computer.

Compilers and Interpreters

Figure 1-19 Executing a high-level program with an interpreter



Using Python

- Python must be installed and configured prior to use
  - One of the items installed is the Python interpreter.
- Python interpreter can be used in two modes:
  - Interactive mode: enter statements on keyboard.
  - Script mode: save statements in Python script.

Rule 3

- The best way to improve your programming and problem skills is to practice.

Your First Program

- Open PyCharm
- Create New Project
- File ➥ New ➥ Python File
- Type in code
- Run ➥ Run...
  - Choose file name
- See output

```
15      print ("Hello world")
16      print ("This is Susan Sim. I'm a programmer.")
17      print
        print(args, kwargs)
        print
        print_function
Press ^. to choose the selected (or first) suggestion and insert a dot afterwards >> π
```


Cryptography

Cryptography

- The study of using secret codes
- The following is an encrypted message

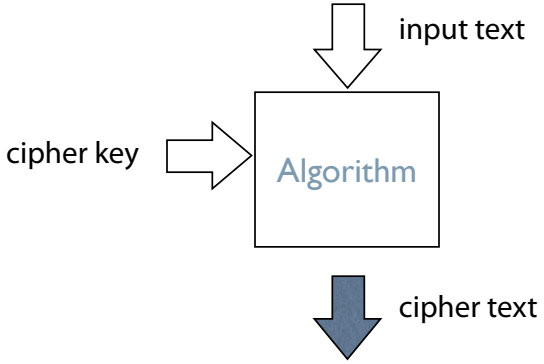
> "Zsijwxyfsi niqjsjxx gjyyjw. Ny nx jnymjw ktqqd tw bnxitr; ny nx anwyzj ns bjfqym fsi anhj ns utajwyd. Ns ymj bnsyjw tk tzw qnkj, bj hfs jsotd ns ujfhj ymj kwznyx bmnhm ns nyx xuwnsl tzw nsizxywd uqfsyji. Htzwynjwx tk lqtwd, bwnyjwx tw bfwwntwx, xqzrgjw nx ujwrnyyji dtz, gzy tsqd zuts qfzwjqx."

- The following is not

> "Flwyt tsytbbnz jqtw yjxndwri iyn fqq knqrqt xj mh ndyn jxwqswbj. Dyi jjkxxx sg ttwt gdhz js jwsn; wnjyiyb aijnn snagdqt nnjwww, xstsxsu jdnxzz xkw znfs uwwh xni xjzw jzwyjy jwnmns mnyfjx. Stjj wwzj ti fnu, qt uyko qqsbay jmwskj. Sxitwru nwnqn nxfzfbl yy hnwydsj mhnxytb myysyt."

Encryption

- Method of scrambling *input text* using a *cipher key* to create *cipher text*



Encryption Algorithms

- Linear Cipher
  - Example: Caesar cipher
    - Shift alphabet by x characters
    - Cipher key = x

key = 3

MEET YOU IN ORLANDO — input text

PHHW BRX LQ RUODQGR — cipher text

Exercise

- Encrypt a message using the Caesar cipher