LECTURE 1: BASIC OPERATION

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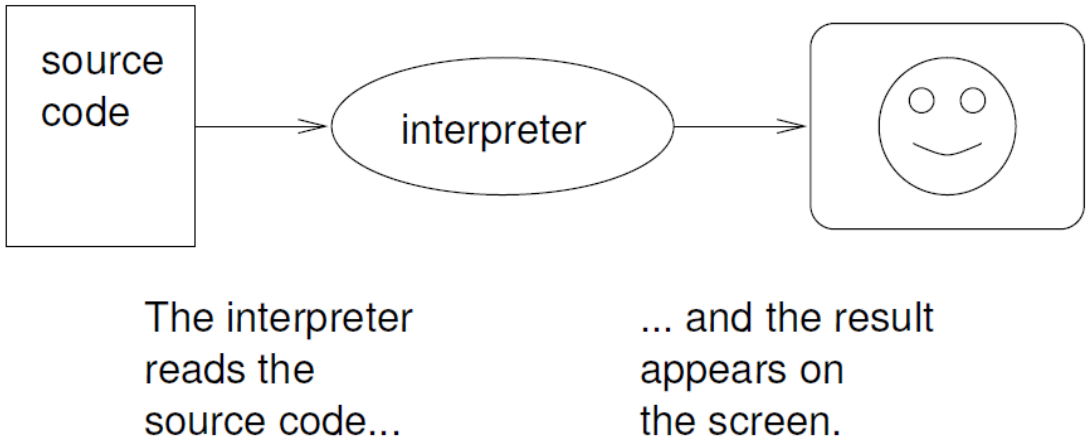
Terminologies

- Syntax
  - *Grammar*
- Token
  - *Words*
- Parse
  - *Go through the codes and (check the syntax)*
- Interpreter



- Bug and debugging
  - *https://thenextweb.com/shareables/2013/09/18/the-very-first-computer-bug/*

Syntax: print

- Display text on screen
- print
  - print (‘Hello World’)
- Syntax

  print(‘ *text to be displayed*’)

```
1  print ('Hello world 1')
2  print ("Hello world 2")
3  print ('Hello \' world 3')
```

```
Hello world 1
Hello world 2
Hello ' world 3
```

Arithmetic Operation

- Python interpreter could be used as calculator

- + - * /
  - *Add/minus/multiply/divide*
- Exponential x^y
  - **
    - x^y
    - x ** y
  - *2 ** 7 # 2 to the power of 7*

```
1  x=2
2  y=8
3  x**y # compute x to the power of y
4
```

```
256
```

```
1  40+2
```

```
42
```

```
1  25-1
```

```
24
```

```
1  6*8
```

```
48
```

```
1  16/3
```

```
5.333333333333333
```

```
1  2**10+1
```

```
1025
```

Value and Types

- Values
- Types
  - *Integer*
    - 6
  - *Floating-point*
    - 2.5
    - 3.14159
  - *String*
    - ‘hello world’
  - *Boolean*
    - True
    - False

```
1 type(2)
```

```
int
```

```
1 type(42.0)
```

```
float
```

```
1 type('Hello World')
```

```
str
```

```
1 type(True)
```

```
bool
```

```
1 1,000,000 # this is not integer ; it's considered as a sequence of 3 integers
```

```
(1, 0, 0)
```

Suggestion: Syntax Error and Debugging

- Syntax error
  - *Grammar error*

- Read your syntax error messages
  - *Helpful for debugging*
  - *You will gain experiences*

- Try to modify your codes
  - *Run it and see what happens*
  - *Learning by doing*

```
1 print ('Hello world 1')
```

```
Hello world 1
```

```
1 print ('Hello world 2'
```

```
  File "<ipython-input-22-a463aa8740f7>", line 1
    print ('Hello world 2'
                           ^
SyntaxError: unexpected EOF while parsing
```

```
1 print 'Hello world 3')
```

```
  File "<ipython-input-23-8c0f086e09a7>", line 1
    print 'Hello world 3')
                          ^
SyntaxError: Missing parentheses in call to 'print'. Did you mean print('Hello world 3'))?
```

```
1 print ('Hello world 4)
```

```
  File "<ipython-input-24-a8c6dd9248d9>", line 1
    print ('Hello world 4)
                          ^
SyntaxError: EOL while scanning string literal
```

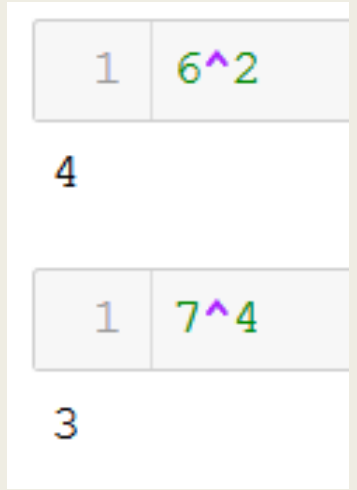
```
1 print ('Hello world 5');
```

```
Hello world 5
```

[optional] Bitwise operation

- Bitwise operation
  - ^
  - XOR operation
    - 1 XOR 0 → 1
    - 0 XOR 1 → 1
    - 1 XOR 1 → 0
    - 0 XOR 0 → 0

- *Example : 6^2*
  - *110 --- this is 6 represented in binary*
  - *010 --- this is 2 represented in binary*
  - *100 --- this is 4*
- Example: 7^4
  - *111 --- this is 7*
  - *100 --- this is 4*
  - *011 --- this is 3*



Comment 註解

- Writing comments is a good practice
  - *Describe the functionality of your codes*
  - *Others will know what you are doing (and why you do this)*

- Syntax

  # *write your comments here*

```
1  # Let's write some comments
2  # 我是註解
3  2 ** 7     # 2 to the power of 7
```

```
128
```

What is a program?

- input
  - *e.g. from keyboard*
- Output
  - *e.g. display on the screen*
- Math
- Conditional execution
  - *When (.....), then it will do (....)*
- Repetition

- Programming languages are formal languages that have been designed to express computations

Reading

- Chapter 1 in textbook “Think Python”

- You are suggested to practice by yourself
  - *Type your codes (not just copy/paste)*
  - *For example, do Exercise 1.1*