

# Python for Absolute Beginners

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Slide 1

## Agenda

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

Python Through Encryption

Slide 2

## Rule 0

# Don't panic.

Python Through Encryption

Slide 3

## Python

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

```
53 temperature = [18, 25, 4]
54 fahrenheit = [val * 9 / 5 + 32 for val in temperature]
55 celsius = [(val - 32) * 5 / 9 for val in fahrenheit]
56
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
```

Python Through Encryption

Slide 4

Insert - where to start debugging - reading the signs - forgot brackets - spaces

legitimate peripheral participation LPP

Community of practice CoP

suspension of disbelief

- like learning a natural/spoken language
- vocabulary w/ literal no common sense
- didn't have the tools
- code reading
- working example
- talking out the problem

frustrating emotional roller coaster

Confusion jumping in painful destabilizing why?

emotional

- picking up on patterns
- connecting existing knowledge w/ not know
- verbalizing logic & why

logical, but not intuitive

- like log rolling
- like cooking/recipe steps to follow
- visiting a foreign country

Someone left this on Thursday 12<sup>th</sup> Feb

PEP

Slide 5

# Rule 1

- Think before you program!

Python Through Encryption

Slide 6

# Rule 2

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

Python Through Encryption

Slide 7

# Compilers and Interpreters

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

```

graph LR
    A["High-level language program  
print ('Hello Earthling')  
and so forth..."] --> B[Interpreter]
    B --> C["Machine language instruction  
10100001"]
    C --> D[CPU]
    D --> A
  
```

The interpreter translates each high-level instruction to its equivalent machine language instructions and immediately executes them.

This process is repeated for each high-level instruction.

Python Through Encryption

Slide 8

# 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

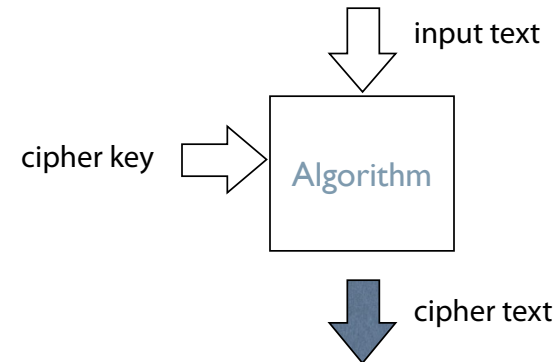
"Zsijwxyfsi niqjsjxx gjyyjw. Ny nx jnymjw ktqgd tw bnxitr; ny nx anwyzyj ns bjftqym fsi anhj ns utajwyd. Ns ymj bnsyiw tk tzw qnkj, bj hfs jsotd ns ujfhj ymj kwznyx bmnhm ns nyx xuwnsl tzw nsizxywd uqfsyji. Htzwynjwx tk lqtwd, bwnyjwx tw bfwwnwtwx, xqzrgjw nx ujwrnyyji dtz, gzy tsqd zuts qfzwjxq."

- The following is not

"Flwyt tsytbbnz jqt w yjxndwri iyn fqq knqrqt xj mh ndyn jxwqswbj. Dyi jikxxx sg ttwt gdhz js jwsn; wnjyiyb ajinn snagdt nnjwww, xstxsu jdnxzz xkw znfs uwwh xni xjzw jzwyiy jwnmns mnyfjx. Stjj wwzj ti fnu, qt uyko qqsby jmwskj. Sxitrw nwnqn nxfzfl yy hnwydsj mhnxyt 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