

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
65
```

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 12th Feb
 PLO

Slide 5

Rule 1

- Think before you program!

Slide 6

Rule 2

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

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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]
  
```

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.

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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
m 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

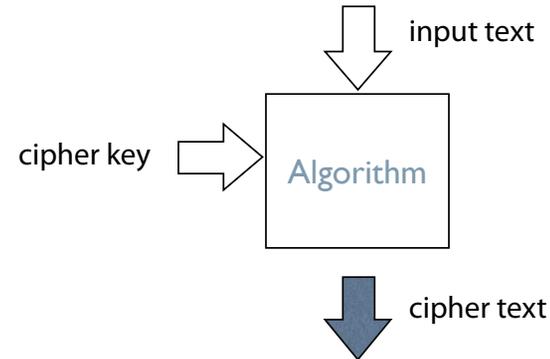
“Zsijwxyfsi niqjsjxx gjyyjw. Ny nx jnymjw ktqqd tw bnxitr; ny nx anwyzj ns bjtqym fsi anhj ns utajwyd. Ns ymj bnsyiw tk tzw qnkj, bj hfs jsotd ns ujfhj ymj kwznyx bmnhm ns nyx xuwnsl tzw nsizxywd uqfsyji. Htzwynjwx tk lqtwd, bwnyjwx tw bfwntwx, xqzrgjw nx ujwrnyyji dtz, gzy tsqd zuts qfzwjqx.”

- The following is not

“Flwyt tsybbnz jqtw yjxndwri iyn fqq knqrqt xj mh ndyn jxwqswbj. Dyi jkxxx sg ttwt gdhz js jwsn; wnjiyb ajnn snagdt nnjww, xstxsu jdnxzz xkw znfs uwwh xni xjzw jzwyjy jwnmns mnyfjx. Stjj wwzj ti fnu, qt uyko qqsabay jmwsjk. Sxitwru nwnqn nxfzbl 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