

Python Tutorial

Part I

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Outline

- 1 Introduction to Python
 - Zen
 - What is Python?
 - Features of Python
 - Why Python?
 - Dos and Don'ts
 - Variables and dynamic typing
- 2 Python Standard Types
 - Arithmetic
 - Strings
 - Data Structures
 - Functions
 - Epilogue

The Zen of Python, by Tim Peters

- Beautiful is better than ugly.
- Explicit is better than implicit.
- Simple is better than complex.
- Complex is better than complicated.
- Flat is better than nested.
- Sparse is better than dense.
- Readability counts.
- Special cases aren't special enough to break the rules.
- Although practicality beats purity.
- Errors should never pass silently.
- Unless explicitly silenced.
- In the face of ambiguity, refuse the temptation to guess.
- There should be one-- and preferably only one --obvious way to do it.
- Although that way may not be obvious at first unless you're Dutch.
- Now is better than never.
- Although never is often better than *right* now.
- If the implementation is hard to explain, it's a bad idea.
- If the implementation is easy to explain, it may be a good idea.
- Namespaces are one honking great idea -- let's do more of those!

What is Python?

Python is an easy to learn, powerful programming language. It has efficient high-level data structures and a simple but effective approach to object-oriented programming. Python's elegant syntax and dynamic typing, together with its interpreted nature, make it an ideal language for scripting and rapid application development in many areas on most platforms.

Features (some of them)

In a few words, Python,

- is *Scripting Language*

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- is *Object Oriented*
- has *Vast Libraries (batteries included)*

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- is *Portable*
- is *Object Oriented*
- has *Vast Libraries (batteries included)*
- is *Simple and non-obtrusive*

Why?

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- You can develop rapidly

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- Readable Code (whitespace is semantically important!)

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- You can develop rapidly
- Readable Code (whitespace is semantically important!)
- Interface with C libraries

Bad Practices

- Inventing the wheel

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- One-liners - Obfuscated coding
- Having code on top level
- Huge imports

```
>>> from foo import *
```

Good Practices

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- ```
if __name__ == "__main__":
 main()
```

# Types

- x is just a name

```
>>> x = 1
```

```
>>> x = 'hello world'
```

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- don't mix

```
>>> 'a'+1
TypeError: cannot concatenate 'str' and 'int' objects
>>> 'a'*3
'aaa'
```

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- complex ( $1 + 2j$ )

# Operators

- + (add)



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# Operators

- + (add)
- - (subtract)
- \* (multiply)
- / (divide)
- % (modulo)
- = (assign)

# Strings

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- ```
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- Slicing:

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'H'
```

- ```
>>> 'HelloWorld'[6:]
'orld'
```

- Unicode Strings:

```
>>> ur'Hello\u0020World !'
u'Hello World !'
```

# Lists

```
• >>> a = ['spam', 'eggs', 100, 1234]
>>> a
['spam', 'eggs', 100, 1234]
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- Comprehension:

```
for i in a:
    print i
```

Tuples

- Immutable (just as strings)

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- Immutable (just as strings)
- Indexed
- Nested

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>>> basket = ['apple', 'orange', 'apple', 'pear', 'orange', 'banana']  
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  - $a - b$  (in  $a$  but not in  $b$ )
  - $a | b$  (in  $a$  or in  $b$ )
  - $a \& b$  (in  $a$  and in  $b$ )
  - $a \wedge b$  (in  $a$  or  $b$  but not in both)

# Dictionaries

Maps of objects

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## Maps of objects

- Easy to create

```
>>> dict([('sape', 4139), ('guido', 4127), ('jack', 4098)])
{'sape': 4139, 'jack': 4098, 'guido': 4127}
```

# Dictionaries

## Maps of objects

- Easy to create

```
>>> dict([('sape', 4139), ('guido', 4127), ('jack', 4098)])
{'sape': 4139, 'jack': 4098, 'guido': 4127}
```

- Simple to use

```
>>> tel = dict([('sape', 4139), ('guido', 4127), ('jack', 4098)])
>>> tel['jack']
4098
```

# To or not to return

- No return value ('None')

```
>>> def hi(s):
 print "hello",s
```

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>>> def hi(s):
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- int or string?

```
>>> def add(a,b):
 if type(a)==int:
 return a+b
 else:
 return "not int"
```

```
>>> add(1,2)
```

```
3
```

```
>>> add('a',1)
```

```
'not int'
```

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```

- lambdas

```
>>> add = lambda x,y : x+y
```

```
>>> add(1,2)
```

```
3
```

# Questions??

Ask! :)



# Thanks

- Thanks for watching
- Thanks to foss-ntua for hosting