

Python Tutorial

Part I

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Outline

1 Introduction to Python

- What is Python?
- Features of Python
- Why Python?
- Dos and Don'ts

2 Python Standard Types

- Arithmetic
- Strings
- Data Structures
- Epilogue

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)

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

Why?

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- Readable Code (whitespace is semantically important!)

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- You can develop rapidly
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- Interface with C libraries

Bad Practices

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- 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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# Numeric types

- `int` ( limitless :-D )

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- float (53 bits precision)
- complex ( $1 + 2j$ )

# Operators

- + (add)

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- $=$  (assign)

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'H'
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- ```
>>> '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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100
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- Comprehension:

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

# Tuples

- Immutable (just as strings)

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# Tuples

- Immutable (just as strings)
- Indexed
- Nested

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>>> basket = ['apple', 'orange', 'apple', 'pear', 'orange', 'banana']
>>> set(basket)
set(['orange', 'pear', 'apple', 'banana'])
```

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  - $a \& b$  (in a and in b)

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- Operators:

- $a - b$  (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

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>>> 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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- int or string return balue

```
>>> 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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```
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```

```
'not int'
```

- lambdas

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

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

```
3
```

# Questions??

Ask! :)

# Thanks

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