A Short Course on Python Programming(Day-3)

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3. Operators

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8. I/O (from Terminal and File)

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Practice Problem -1

```
# Create a list (numbers) having integer value from 0
   to 1000.

# Create a list (squares) having square of
   numbers(0-1000) list.

# Create a list (exponents) having power of 5 (x ** 5
   ) numbers(0-1000) list.

# Create a list by filtering even numbers from
   exponents list.
```

Practice Solution -1

```
numbers = [ number for number in range(1001)]

squares = [ number * number for number in range(1001)]

exponents = [ number ** 5 for number in range(1001)]

evens = [ number ** 5 for number in range(1001) \
         if number % 2 == 0]
```

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What is Modules?

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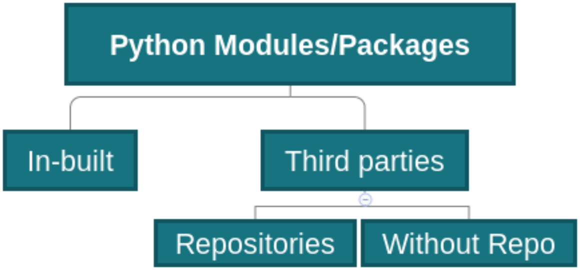
Python Modules



Importing modules

```
import modulename

from modulename import *

from modulename import methodname
```

OS

```

# http://www.guru99.com/python-tutorials.html

import os

import os.path

from os import path
```

OS

```

print path.exists("foo.txt")
#True
print path.isfile("foo.txt")
#True
print path.isdir("foo.txt")
#False
print path.realpath("foo.txt")
#/home/ajit/Python-Workshop/foo.txt
```

OS

```
print path.split(path.realpath("foo.txt"))

#('/home/ajit/Python-Workshop', 'foo.txt')

print path.getmtime("foo.txt")
#1487878444.06

import time
print time.ctime(path.getmtime("foo.txt"))
#Fri Feb 24 01:04:04 2017
```

3rd Party module Installation

```
# from PyPi i.e. Python repo
# Windows you can have excutable installer also
# pip install modulename

# easy_install modulename

# From the source code

# python setup.py install

# sudo python setup.py install
```

Installation:Example

```
# pip install simplejson

# simplejson-3.10.0.win32-py2.7.exe (md5, pgp)

# https://pypi.python.org/pypi/simplejson#downloads
```

Source:
https://pypi.python.org/pypi/simplejson

Example:A user module

```
# day3modules.py
def main():
    print "Hello Python Modules-from main()!!"

def main2():
    print "Hello Python Modules-from main2()!!"

if __name__ == "__main__":
    main()
    main2()
```

Example:Calling User Module-1

```python
import day3modules

day3modules.main()

day3modules.main2()
```

Example:Calling User Module-2

```python
from day3modules import main

main()

#error
day3modules.main2()

#  day3modules.main2()
# NameError: name 'day3modules' is not defined
```

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Exception

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- An exception is an event, which occurs during the execution of a program that disrupts the normal flow of the program's instructions.
- Why it is import to handle exception?
- When a Python script raises an exception, it must either handle the exception immediately otherwise it terminates and quits.

Exceptions-1

```
# Exception , StopIteration , SystemExit ,

# StandardError , ArithmeticError , OverflowError ,

# FloatingPointError , ZeroDivisonError ,

# AssertionError , AttributeError , EOFError ,

# ImportError , KeyboardInterrupt , LookupError ,
```

Exceptions- 2

```

#IndexError , KeyError , NameError ,
    UnboundLocalError ,

#EnvironmentError , IOError , OSError , SyntaxError,

# IndentationError , SystemError , SystemExit ,

# TypeError , ValueError , RuntimeError ,
    NotImplementedError ,
```

Exception Handling

```
#Exception Handling
#An exception is an event, which occurs during
#the execution of a program that disrupts the
# normal flow of the program’s instructions.
try:

except:

else:

finally:
```

Exception Handling:Template

```
try:
   You do your operations here;
   ......................
except ExceptionI:
   If there is ExceptionI, then execute this block.
except ExceptionII:
   If there is ExceptionII, then execute this block.
   ......................
else:
   If there is no exception then execute this block.
```

Source:http://www.tutorialspoint.com/python/python_exceptions.htm

Exception Handling:Example

```
#!/usr/bin/python

try:
   fh = open("testfile", "w")
   fh.write("This is my test file for exception
      handling!!")
except IOError:
   print "Error: can\'t find file or read data"
else:
   print "Written content in the file successfully"
   fh.close()
```

Importing modules-Exceptions

```

# import with exception

try:
    import mymodule
except ImportError:
    import mymodule2
```

Source: `https://www.tutorialspoint.com/python/standard_exceptions.htm`

Python Style-1

```
import this

#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.
```

Source:
https://www.python.org/dev/peps/pep-0008/

Python Style-2

```
#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.
```

Python Style-3

```
#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.
```

Python Style-4

```
#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!
```

PEP-8

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7. Two blank lines between top-level definitions, one blank line between method definitions.
8. Follow standard typographic rules for the use of spaces around punctuation.
9. Generally only one statement per line.

Variable naming

```
#module_name, package_name, ClassName,

#method_name, ExceptionName, function_name,

#GLOBAL_CONSTANT_NAME, global_var_name,

#instance_var_name, function_parameter_name,

#local_var_name.
```

Source:https://google.github.io/styleguide/pyguide.html

A example:List of largest

```python
a = [1, 2, 3, 4, 5]
b = [2, 2, 9, 0, 9]

def pick_the_largest(a, b):
```

Source: https://bradmontgomery.net/blog/2013/04/01/pythons-zip-map-and-lambda/

A example:List of largest

```python
a = [1, 2, 3, 4, 5]
b = [2, 2, 9, 0, 9]

def pick_the_largest(a, b):
    result = [] # A list of the largest values

    # Assume both lists are the same length
    list_length = len(a)
    for i in range(list_length):
        result.append(max(a[i], b[i]))
    return result

print pick_the_largest(a, b)
```

zip()

```
# ZiP()
# This function takes two equal-length collections,
# and merges them together in pairs.

print zip(a, b)

# [(1, 2), (2, 2), (3, 9), (4, 0), (5, 9)]
```

zip()

```
# https://docs.python.org/2/library/functions.html#zip

x = [1, 2, 3]
y = [4, 5, 6]
zipped = zip(x, y)
print zipped

#[(1, 4), (2, 5), (3, 6)]
```

unzip

```python
x2, y2 = zip(*zipped)

print x2,y2
# (1, 2, 3) (4, 5, 6)
print x == list(x2) and y == list(y2)

#True
```

Lambda

```
#lambda

# lambda is just a shorthand to create an anonymous
    function.
# It’s often used to create a one-off function
    (usually for
# scenarios when you need to pass a function
# as a parameter into another function).
# It can take a parameter,
# and it returns the value of an expression.
```

Lambda:How to

```python
# lambda <input>: <expression>

# lambda pair: max(pair)

g = lambda x: x**2
print g(8)
#64
```

map()

```
# map()
# It takes a function, and applies it to each item
# in an iterable (such as a list).

#https://docs.python.org/2/library/functions.html#map

# map(some_function, some_iterable)
```

map():Example

```python
items = [1, 2, 3, 4, 5]
def sqr(x):
    return x ** 2

list(map(sqr, items))

#[1, 4, 9, 16, 25]
```

Largest from two list

```
# # apply the lambda to each item in the zipped list

print map(lambda pair: max(pair), zip(a, b) )

# [2, 2, 9, 4, 9]
```

Largest from two list:variants

```
print list(map(max, zip(a,b)))

print [max(pair) for pair in zip(a,b)]

print [max(ai,bi) for ai, bi in zip(a,b)]

print list(map(max,a,b))
# map return list so no need of typecast
print map(max,a,b)
```

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Assignments:Please refer attached file for details.

- Email the script to `ajit.pythonclass@gmail.com` with subject as **Roll Name Day-3 Mini Project**.

To be Continue...

import time
time.sleep$(7 * 24 * 60 * 60)$

print "Thank you"