

Python简介

简介

python来源：

Python的创始人为Guido van Rossum。1989年圣诞节期间，在阿姆斯特丹，Guido为了打发圣诞节的无趣，决心开发一个新的脚本解释程序，做为ABC语言的一种继承，就这样，Python在Guido手中诞生了。实际上，第一个实现是在Mac机上。可以说，Python是从ABC发展起来。并且结合了Unix shell和C的习惯。

python设计风格：

Python的设计哲学是“优雅”、“明确”、“简单”。因此，Perl语言中“总是有多种方法来做同一件事”的理念在Python开发者中通常是难以忍受的。Python开发者的哲学是“用一种方法，最好是只有一种方法来做一件事”。在设计Python语言时，如果面临多种选择，Python开发者一般会拒绝花俏的语法，而选择明确的没有或者很少有歧义的语法。

python 代码简单介绍

HelloWorld:

```
def main():  
    print "hello world"  
if __name__=="__main__":  
    main()
```

output:helloworld

ForLoop:

```
nums=[1,2,3,4,5]  
for num in nums:  
    print num  
1,2,3,4,5
```

python 代码最大的特点就是:通过空格来定制作用域范围。假如写Java的话。假如写完了一个个长长的if循环。我们都会使用IDE帮我们FormatCode, 让看上去比较清晰。但是在python中。直接就通过空格来制定作用域。一个是少打“{}”另一个是整个代码看上去一目了然。结构清晰

python 语言规则

	python	java
导入库:(都是关键字import)	<pre>import os.path from os import path</pre> <p>库来源于系统。或者制定目录</p>	<pre>import com.apache.** import static com.apache.*</pre> <p>默认来源于管理工具 Maven 或者IDE管理</p>
第三方库工具	pip/easy_install	maven /ant/gradle
面向对象, (都是class)	<pre>class A(B):</pre> <p>可以为多继承</p> <pre>--</pre>	<pre>Class A extends B</pre> <p>只能单继承可继承多个接口</p>

python 内置数据结构

	python	java
List	<code>a=[]</code>	<code>List<X> a=new ArrayList<X>()</code>
Tuple	<code>a=(b,c)</code>	<code>Tuple<K,V> tuple=new Tuple<K,V></code>
Dict	<code>a={b,c}</code>	<code>Map<K,V> a=new HashMap<K,V>()</code>
Set	<code>a=set([b,c,d])</code>	<code>set(K,V) a= (Map<K,V>)object.getSet()</code>

python 是动态语言

python 是动态语言。动态的语言的意思是。变量的类型无法在编译时知道。只有在运行时知道。

```
a="this is " -->string
```

```
a=a.__len__()--->int
```

是可以的

Java则必须是

```
String a="this is"
```

```
int b=a.length()
```

严格要求各个变量的类型

动态语言比强类型语言有更大的灵活性。为什么了。因为你写某些程序。你根本无法预想知道类型是什么。结果是什么。

Java有一个泛型的东西。Class<X> 来动态处理程序。但是灵活程度显然不如python高

AOP

python函数式编程

函数可以作为参数调用

```
def hello(a,interface):  
    interface(a)
```

```
def say(str):  
    print(str)
```

```
hello("helloworld",say)
```

output:helloworld

lambda,匿名函数:

python:

```
g=lambda a=a*a
```

```
print g(2)
```

output:4

```
java8: Runnable r = () -> {  
    System.out.println("Running!");  
};
```

java加lambda 可以推到出来是哪个用

Yield

```
def abc():  
    for i in range(0,10):  
        print a
```

```
def abc():  
    for i in range(0,10):  
        yield a
```

python场景

python是现在非常红火的语言：

云：OpenStack

后台：Django (douban) Flask

计算：PySic (大规模的被国外大学采用)

后台管理：Python是Linux第二大脚本语言。googleGae支持python。Google内部支持python

DSL：垂直语言方面非常受欢迎

运维:

简单命令:

```
Deepin Terminal
top - 19:35:32 up 7:01, 1 user, load average: 1.85, 1.95, 2.04
Tasks: 289 total, 2 running, 286 sleeping, 0 stopped, 1 zombie
%Cpu(s): 18.2 us, 2.3 sy, 0.0 ni, 77.7 id, 1.8 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem: 3906012 total, 3761552 used, 144460 free, 14396 buffers
KiB Swap: 3907236 total, 2136132 used, 1771104 free, 517568 cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU  %MEM    TIME+  COMMAND
23773 friddle   20   0 533m  73m 4304 S 17.6   1.9   29:47.96 compiz
10103 friddle   20   0 4334m 108m 19m S 16.9   2.8   10:44.93 deepin-music-pl
23433 root       20   0 577m 103m 61m R 16.6   2.7   28:49.13 Xorg
28469 friddle   20   0 2581m  37m  9.8m S  8.6   1.0   14:17.36 deepin-translat
12722 friddle   20   0  730m  66m 7472 S  8.0   1.8    0:15.86 deepin-terminal
24367 friddle   20   0 3742m 598m 11m S  4.0  15.7    6:47.16 java
 2775 friddle    9 -11 422m 3992 2864 S  2.0   0.1    8:55.98 pulseaudio
 2773 friddle   20   0  988m  39m 9076 S  1.7   1.0    0:18.67 chrome
2650 friddle   20   0 2546m 123m 26m S  1.3   3.2    8:41.55 chrome
2858 friddle   20   0 1042m 126m 13m S  1.3   3.3    1:30.83 chrome
23715 friddle   20   0 654m  16m 3988 S  1.0   0.4    1:32.86 gnome-settings-
1154 mongodb    20   0  153m 1704 1272 S  0.7   0.0    3:42.52 mongod
9754 friddle   20   0 1556m 521m 30m S  0.7  13.7   11:34.87 chrome

 1  2  3
/home/friddle/Dropbox/L...
```

LoadAverage:负载
Tasks:进程数
Zombie:僵尸进程
KibMem:内存
KibSwap:交换内存
PR:系统优先级
NI:用户优先级
TIME:已经运行时间
us 用户空间
fy 内核空间

ifconfig

```
Deepin Terminal
ifconfig
friddle@friddle:/home/friddle/Dropbox/Learn/Python/show> ifconfig
eth0      Link encap:Ethernet  HWaddr 5c:f9:dd:5d:37:5a
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Interrupt:17

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:146375 errors:0 dropped:0 overruns:0 frame:0
          TX packets:146375 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:89135255 (89.1 MB)  TX bytes:89135255 (89.1 MB)

usb0      Link encap:Ethernet  HWaddr 56:91:6c:91:28:63

1 2 3 4 /home/friddle/Dropbox/L...
```

eth0:接口名字

Link(方式): Ethernet(以太网)/LoopBack(回环)

HWaddr(硬件地址)

RX(receive data)

TX (transmission data)

netstat

netstat -a 已经建立的连接

```
Deeplin Terminal
friddle@friddle:/home/friddle> netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 *:https                  *:*                     LISTEN
tcp      0      0 *:1723                   *:*                     LISTEN
tcp      0      0 *:17500                  *:*                     LISTEN
tcp      0      0 localhost:6942           *:*                     LISTEN
tcp      0      0 *:902                    *:*                     LISTEN
tcp      0      0 *:2023                   *:*                     LISTEN
tcp      0      0 *:58408                  *:*                     LISTEN
tcp      0      0 *:8200                   *:*                     LISTEN
tcp      0      0 localhost:27017          *:*                     LISTEN
tcp      0      0 localhost:mysql          *:*                     LISTEN
tcp      0      0 localhost:11211          *:*                     LISTEN
tcp      0      0 localhost:63342          *:*                     LISTEN
tcp      0      0 *:2864                   *:*                     LISTEN
tcp      0      0 localhost:28017          *:*                     LISTEN
tcp      0      0 localhost:8307           *:*                     LISTEN
tcp      0      0 friddle:domain           *:*                     LISTEN
tcp      0      0 *:42902                  *:*                     LISTEN
```

netstat -s 按连接类型分

```
Deeplin Terminal
friddle@friddle:/home/friddle/Dropbox/Learn/Python/show> netstat -s
Ip:
1532038 total packets received
0 forwarded
0 incoming packets discarded
1531820 incoming packets delivered
1433883 requests sent out
4 outgoing packets dropped
544 dropped because of missing route
Icmp:
2551 ICMP messages received
356 input ICMP message failed.
ICMP input histogram:
destination unreachable: 2540
timeout in transit: 7
echo replies: 4
3596 ICMP messages sent
0 ICMP messages failed
ICMP output histogram:
destination unreachable: 3591
```

网络

iftop: 当前流量排名

Deepin Terminal									
		191Mb	381Mb	572Mb	763Mb	954Mb			
friddle	=> london.kapeli.com	29.4kb	46.1kb	48.4kb					
	<=	908kb	1.38Mb	1.43Mb					
friddle	=> hkg03s16-in-f14.1e100.net	0b	2.38kb	1.52kb					
	<=	0b	965b	658b					
friddle	=> 111.1.32.24	2.36kb	957b	598b					
	<=	4.22kb	1.69kb	1.05kb					
friddle	=> 173.194.127.233	0b	1.84kb	1.15kb					
	<=	0b	801b	500b					
friddle	=> 239.255.255.251	4.81kb	1.92kb	1.80kb					
	<=	0b	0b	0b					
friddle	=> 211.140.188.188	0b	351b	220b					
	<=	0b	315b	197b					
friddle	=> 192.168.42.129	0b	286b	398b					
	<=	0b	77b	334b					
TX:		cum:	109kb	peak:	91.7kb	rates:	36.6kb	54.8kb	54.7kb
RX:			2.87MB		2.68Mb		912kb	1.38Mb	1.44Mb
TOTAL:			2.98MB		2.77Mb		949kb	1.44Mb	1.49Mb
1	2	3	4	5	6	7	8		
								/home/friddle/Dropbox/L...	

ifstat: 监听端口流量

Deepin Terminal									
0.00	0.00	223.38	14.48						
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	181.11	11.11						
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	362.23	22.87						
0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.00
0.00	0.00	227.89	16.59						
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	160.95	13.42						
0.00	0.00	0.00	0.00	0.00	0.73	0.00	0.00	0.00	0.00
0.00	0.00	168.07	13.23						
0.00	1.56	0.00	0.00	0.00	1.02	0.00	0.00	0.00	0.00
0.00	0.00	70.80	7.06						
0.00	1.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	283.38	21.94						
0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	178.72	12.97						
0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00
0.00	0.00	280.69	17.78						
1	2	3	4	5	6	7	8		
								/home/friddle/Dropbox/L...	

网络

NetHogs: 查看软件流量

Deepin Terminal

NetHogs version 0.8.0

PID	USER	PROGRAM	DEV	SENT	RECEIVED
15422	friddle	zeal	usb0	8.097	191.693 KB/sec
10103	friddle	/usr/bin/python	usb0	0.496	29.011 KB/sec
2599	friddle	python	usb0	0.639	0.312 KB/sec
24075	friddle	fcitx	usb0	0.122	0.225 KB/sec
23902	friddle	..dle/.dropbox-dist/dropbox	usb0	0.080	0.061 KB/sec
24367	friddle	..vm/java-7-oracle/bin/java	usb0	0.000	0.013 KB/sec
?	root	...84:47150-111.1.36.137:80		0.000	0.000 KB/sec
?	root	...84:55230-111.1.23.202:80		0.000	0.000 KB/sec
2650	friddle	..ogle/chrome/google-chrome	usb0	0.000	0.000 KB/sec
26973	friddle	/usr/bin/kuaipan4uk	usb0	0.043	0.000 KB/sec
?	root	unknown TCP		0.000	0.000 KB/sec
TOTAL				9.478	221.314 KB/sec

1 2 3 4 5 6 7 8 9

/home/friddle/Dropbox/L...

lsof

lsof -p pid 查看pid
占用的IO资源

lsof -i 端口 查看端
口占用的IO资源

```
Deepin Terminal
Press ENTER or type command to continue
friddle@friddle:/home/friddle/Dropbox/Learn/Python/show> lsof -p 15422
zsh: correct 'lsof' to 'lsof' [nyae]? y
```

COMMAND	PID	USER	FD	TYPE	DEVICE	SIZE/OFF	NODE	NAME
zeal	15422	friddle	cwd	DIR	8,4	12288	2359297	/home/friddle
zeal	15422	friddle	rtd	DIR	8,18	4096	2	/
zeal	15422	friddle	txt	REG	8,18	430424	409260	/usr/bin/zeal
zeal	15422	friddle	mem	REG	8,18	18229040	1311458	/usr/share/fonts/truetype/XHei_Mono.Ubuntu.ttc
zeal	15422	friddle	mem	REG	8,18	33114164	1311460	/usr/share/fonts/truetype/XSung_Blade.ttc
zeal	15422	friddle	DEL	REG	0,4		228261931	/SYSV00000000
zeal	15422	friddle	mem	REG	8,18	378872	1054639	/lib/x86_64-linux-gnu/libssl.so.1.0.0
zeal	15422	friddle	mem	REG	8,18	1930656	1054638	/lib/x86_64-linux-gnu/libcrypto.so.1.0.0
zeal	15422	friddle	DEL	REG	0,4		245170194	/SYSV00000000

12345678910

/home/friddle/Dropbox/L...

查找Java代码那段耗时间最多

pid指的是tomcat java的pid。

`pstree -p java`

`ps -mp pid -o THREAD,tid,time,rss,size,%mem`

```
Deepin Terminal
tomcat 3.7 24 - futex_ - - 22598 00:05:02
tomcat 3.8 24 - futex_ - - 22599 00:05:13
tomcat 0.0 14 - futex_ - - 22600 00:00:00
tomcat 0.0 24 - futex_ - - 22601 00:00:00
tomcat 0.0 24 - futex_ - - 22602 00:00:00
tomcat 0.0 24 - 969636 - - 22603 00:00:00
tomcat 0.0 24 - futex_ - - 22604 00:00:00
tomcat 0.0 23 - futex_ - - 22679 00:00:01
tomcat 0.0 23 - futex_ - - 22680 00:00:01
tomcat 0.0 23 - 184466 - - 22681 00:00:01
tomcat 29.9 24 - 184466 - - 22769 00:39:37
tomcat 2.1 24 - futex_ - - 22770 00:02:52
tomcat 0.0 23 - 184466 - - 22788 00:00:01
tomcat 0.0 23 - futex_ - - 22789 00:00:01
tomcat 0.0 23 - 184466 - - 22790 00:00:01
tomcat 0.6 24 - futex_ - - 22791 00:00:55
tomcat 0.0 23 - futex_ - - 22893 00:00:01
tomcat 3.7 24 - futex_ - - 26654 00:03:41
tomcat 0.6 24 - - - - 27518 00:00:32
tomcat 3.2 24 - futex_ - - 27519 00:02:55
```

1	2	3	4	5	6	7	8	9	10	11	12	13	14	/home/friddle/Dropbox/L...
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----------------------------

看到有一个进程又29.9%
那么继续printf "%x\n" tid

--->58ec 变成16进

`./jstack 22385 |grep 58f1 -A 30`

```
Deepin Terminal
58f1
[tomcat@uhz000987 bin]$ ./jstack 22385 |grep 58f1 -A 30
"transcoder-1-1" prio=10 tid=0x00002aaac0e9c800 nid=0x58f1 waiting on condition
[0x000000004056a000]
  java.lang.Thread.State: WAITING (parking)
    at sun.misc.Unsafe.park(Native Method)
      - parking to wait for <0x0000000078c70a9b0> (a java.util.concurrent.locks
s.AbstractQueuedSynchronizer$ConditionObject)
    at java.util.concurrent.locks.LockSupport.park(LockSupport.java:186)
    at java.util.concurrent.locks.AbstractQueuedSynchronizer$ConditionObject
.await(AbstractQueuedSynchronizer.java:2043)
    at java.util.concurrent.ArrayBlockingQueue.take(ArrayBlockingQueue.java:
374)
    at java.util.concurrent.ThreadPoolExecutor.getTask(ThreadPoolExecutor.java:1068)
    at java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1130)
    at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:615)
    at java.lang.Thread.run(Thread.java:744)
```

1	2	3	4	5	6	7	8	9	10	11	12	13	14	/home/friddle/Dropbox/L...
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----------------------------

df -h

```
Deepin Terminal
host-manager.2014-03-17.log manager.2014-03-18.log
host-manager.2014-03-18.log manager.2014-03-19.log
host-manager.2014-03-19.log manager.2014-03-20.log
host-manager.2014-03-21.log manager.2014-03-21.log
host-manager.2014-03-23.log manager.2014-03-23.log
host-manager.2014-03-24.log manager.2014-03-24.log
host-manager.2014-03-25.log manager.2014-03-25.log
host-manager.2014-03-26.log manager.2014-03-26.log
localhost.2014-03-07.log
[tomcat@uhz000987 tomcat]$ df
文件系统          1K-块          已用          可用 已用% 挂载点
/dev/hda1          46716616    20681764    23623500    47% /
tmpfs              1287372         0     1287372     0% /dev/shm
/dev/xvdb1         92885064    21834980    66331796    25% /data
[tomcat@uhz000987 tomcat]$ df -h
文件系统          容量  已用  可用 已用% 挂载点
/dev/hda1          45G   20G   23G   47% /
tmpfs              1.3G   0    1.3G   0% /dev/shm
/dev/xvdb1         89G   21G   64G   25% /data
[tomcat@uhz000987 tomcat]$
```

1	2	3	4	5	6	7	8	9	10	11	12	13	14	/home/friddle/Dropbox/L...
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----------------------------

磁盘使用率