

Python调试技术

NSD SERVICES02

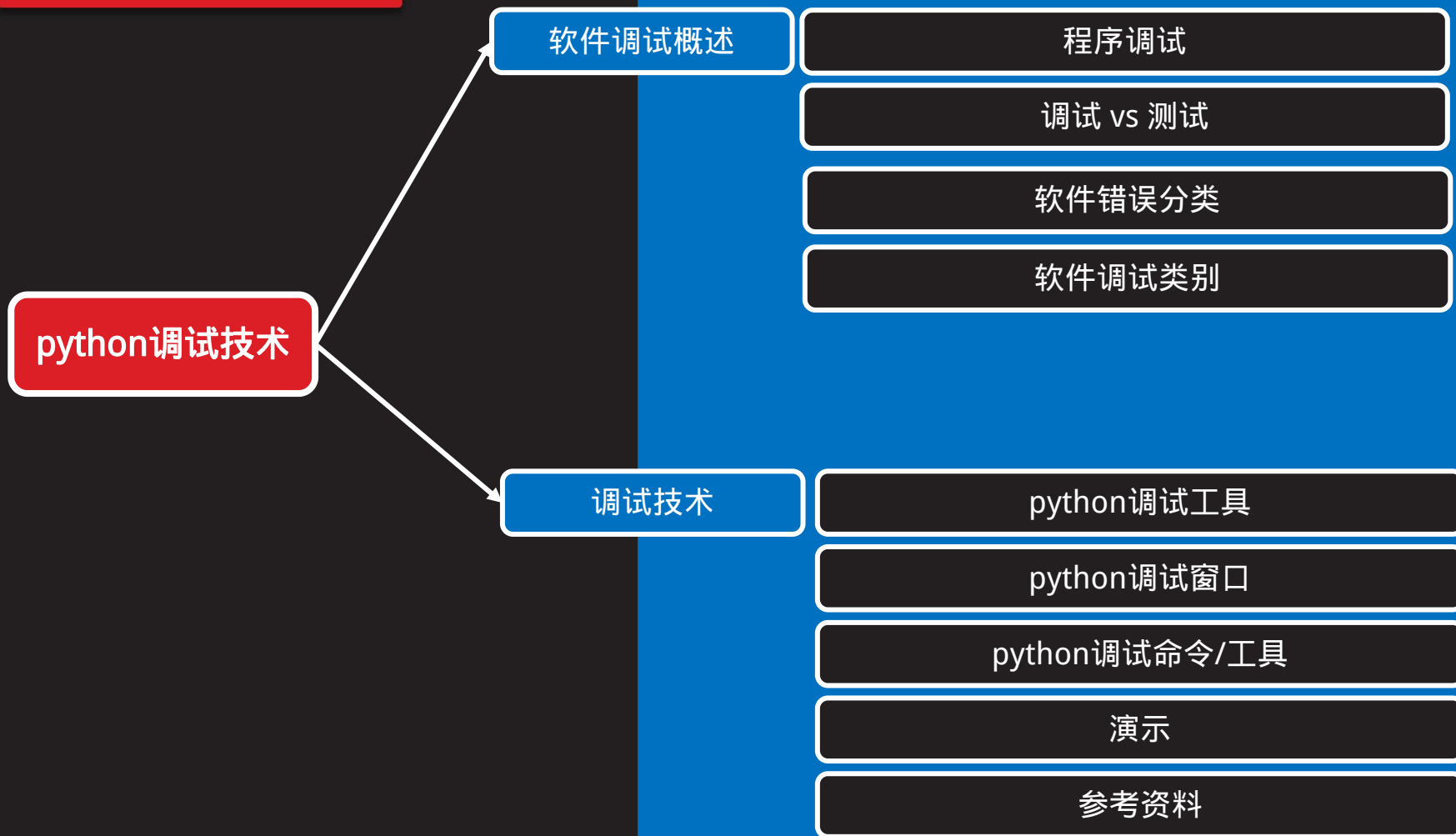
DAY01

内容

上午	09:00 ~ 09:30	
	09:30 ~ 10:20	
	10:30 ~ 11:20	
	11:30 ~ 12:20	
下午	14:00 ~ 14:50	
	15:00 ~ 15:50	
	16:00 ~ 16:50	
	17:00 ~ 17:30	



python调试技术



软件调试概述



程序调试

- 程序调试，是将编制的程序投入实际运行前，用手工或编译程序等方法进行测试，修正语法错误和逻辑错误的过程。这是保证计算机信息系统正确性的必不可少的步骤。编完计算机程序，必须送入计算机中测试。



调试 vs 测试

- 目的
- 执行人
- 手段



错误分类

- 语法错误
 - 拼写错误
 - 引用错误
 - 缩进错误
- 运行时错误
 - 根据运行时环境变化导致的错误
- 逻辑错误
 - 程序成功运行，由于逻辑问题导致的错误结果



错误分类-语法错误

```
a = list[]
```

```
a[3] = 4
```

```
print(a)
```



错误分类-运行时错误

... ..

```
fh = open("/home/me/test.py")
```

... ..

上下文无try语句和任何错误处理语句



错误分类-逻辑错误

$a = 3.4$

$b = 5.6$

$c = 23.4$

$d = (a + b + c) / 3$

求a,b,c 三个数的平均数，取整数就行



软件调试类别

- 静态调试
 - 人工筛查 - 静静的“看”
- 动态调试
 - 实际上机调试，使程序“动”起来



python调试技术



python调试工具

- 基于命令行的工具
 - pdb
 - ipdb
 - pudb
- IDE集成环境
 - pycharm
 - eclipse



pycharm 调试窗口

- Debugger
- Console
- Watches
- Variable



pycharm 调试窗口

The screenshot displays the PyCharm IDE interface during a Python debugging session. The components are labeled with handwritten red numbers:

- 1**: Points to the **Project** tool window on the left, specifically the **Teaching** directory.
- 2**: Points to the **Editor** window showing the source code of `t03.py`. The code includes variable assignments and function calls.
- 3**: Points to the **Debugger** tool window at the bottom left, showing the **Frames** tab with the current stack frame.
- 4**: Points to the **Variables** tool window at the bottom center, displaying the current state of variables like `A`, `B`, `C`, and `alist`.
- 5**: Points to the **Watches** tool window at the bottom right, showing expressions being monitored during execution.
- 6**: Points to the **Run** button in the top toolbar, which is used to start the debugging process.

The code in the editor window is as follows:

```

43     return cc
44
45
46     A = 3.4    A: 3.4
47     B = 5.8    B: 5.8
48     C = 9.3    C: 9.3
49
50
51     AA = A + B
52     print(AA)
53
54     BB = mySum(A, B, C)
55     print(BB)
56
57     DD = mySub(A, B, C)
58     print(DD)
59
60     CC = A + B + C
61     print(CC)
    
```

pycharm 调试工具/命令

- Step Over (F8)
- Force Step Over
- Step Into (F7)
- Step Into My Code
- Smart Step Into
- Step Out (Shift + F8)
- Run To Cursor
- Force Run To Cursor



演示

打开Pycharm并下载程序测试包



参考资料

<http://www.jetbrains.com/help/pycharm/2016.1/debug-tool-window.html>

