Pdb调试器

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python 语言程序设计

pdb调试

- pdb 是 python 自带的一个包，为 python 程序提供了一种交互的源代码调试功能，主要特性包括
  - 设置断点
  - 单步调试
  - 进入函数调试
  - 查看当前代码
  - 查看栈片段
  - 动态改变变量的值

pdb调试

- 模拟bmi计算的程序

```
def debug_bmi(height, weight, gender):
        if gender != 'male' and gender !='female':
                print("input error")
        elif gender == 'male':
                standard_weight =  (height - 100)*0.9
        else:
                standard_weight = (height - 100)*0.9 - 2.5
        if weight <= (standard_weight*0.9):
                print ("You BMI is -1")
        elif  weight <(standard_weight*1.1):
                print ("You BMI is 0")
        elif  weight <(standard_weight*1.2):
                print ("You BMI is 1")
        elif  weight <(standard_weight*1.3):
                print ("You BMI is 2")
        elif  weight <(standard_weight*1.5):
                print ("You BMI is 3")
        else:
                print ("You BMI is 4")

if __name__ == "__main__":
    debug_bmi(160,60,'male')
```

加入断点

```
_DEBUG = True
def debug_bmi(height, weight, gender):
        if _DEBUG == True:
                import pdb
                pdb.set_trace()
        if gender != 'male' and gender !='female':
                print("input error")
        elif gender == 'male':
                standard_weight =  (height - 100)*0.9
        else:
                standard_weight = (height - 100)*0.9 - 2.5
        if weight <= (standard_weight*0.9):
                print ("You BMI is -1")
        elif  weight <(standard_weight*1.1):
                print ("You BMI is 0")
        elif  weight <(standard_weight*1.2):
                print ("You BMI is 1")
        elif  weight <(standard_weight*1.3):
                print ("You BMI is 2")
        elif  weight <(standard_weight*1.5):
                print ("You BMI is 3")
        else:
                print ("You BMI is 4")

if __name__ == "__main__":
     debug_bmi(160,60,'male')
```

开始运行调试

```
> d:\python34\debug_bmi.py(6)debug_bmi()
-> if gender != 'male' and gender !='female':
(Pdb)
```

- if gender != ‘male’ and gender != ‘female’ :指示当前的语句
- （pdb）等待调试指令

pdb的指令很丰富，输入h指令可以查看指令的使用方法。下面简单介绍常用指令：

开始运行调试

- 查看代码上下文，l（小写L）

```
> d:\python34\debug_bmi.py(6)debug_bmi()
-> if gender != 'male' and gender !='female':
(Pdb) l
  1       _DEBUG = True
  2       def debug_bmi(height, weight, gender):
  3               if _DEBUG == True:
  4                       import pdb
  5                       pdb.set_trace()
  6   ->          if gender != 'male' and gender !='female':
  7                       print("input error")
  8               elif gender == 'male':
  9                    standard_weight =  (height - 100)*0.9
 10               else:
 11                    standard_weight = (height - 100)*0.9 - 2.5
(Pdb)
```


左边是行号，右边是代码正文。

开始运行调试

- 监视变量：p 变量名

```
(Pdb) p gender
'male'
(Pdb) p height
160
(Pdb) p weight
60
(Pdb)
```

开始运行调试

- 单步执行：n

```
(Pdb) n
> d:\python34\debug_bmi.py(8)debug_bmi()
-> elif gender == 'male':
(Pdb) n
> d:\python34\debug_bmi.py(9)debug_bmi()
-> standard_weight =  (height - 100)*0.9
(Pdb) l
  4                    import pdb
  5                    pdb.set_trace()
  6              if gender != 'male' and gender !='female':
  7                    print("input error")
  8              elif gender == 'male':
  9  ->                standard_weight =  (height - 100)*0.9
 10              else:
 11                   standard_weight = (height - 100)*0.9 - 2.5
 12              if weight <= (standard_weight*0.9):
 13                   print ("You BMI is -1")
 14              elif  weight <(standard_weight*1.1):
(Pdb)
```

开始运行调试

- 加入断点：b 行号

```
(Pdb) l
  4                    import pdb
  5                    pdb.set_trace()
  6              if gender != 'male' and gender !='female':
  7                    print("input error")
  8              elif gender == 'male':
  9  ->                standard_weight =  (height - 100)*0.9
 10              else:
 11                   standard_weight = (height - 100)*0.9 - 2.5
 12              if weight <= (standard_weight*0.9):
 13                   print ("You BMI is -1")
 14              elif  weight <(standard_weight*1.1):
(Pdb) b 14
Breakpoint 1 at d:\python34\debug_bmi.py:14
```

开始运行调试

- 运行到断点：c

```
(Pdb) c
> d:\python34\debug_bmi.py(14)debug_bmi()
-> elif  weight <(standard_weight*1.1):
(Pdb) l
  9                   standard_weight =  (height - 100)*0.9
 10              else:
 11                   standard_weight = (height - 100)*0.9 - 2.5
 12              if weight <= (standard_weight*0.9):
 13                     print ("You BMI is -1")
 14 B->          elif  weight <(standard_weight*1.1):
 15                     print ("You BMI is 0")
 16              elif  weight <(standard_weight*1.2):
 17                     print ("You BMI is 1")
 18              elif  weight <(standard_weight*1.3):
 19                     print ("You BMI is 2")
(Pdb)
```

开始运行调试

- 执行到函数返回前：r

```
(Pdb) r
You BMI is 1
--Return--
> d:\python34\debug_bmi.py(17)debug_bmi()->None
-> print ("You BMI is 1")
(Pdb)
```

调试函数

```
_DEBUG = True
def ml_std_weight(height):
        standard_weight = (height - 100)*0.9
        return standard_weight

def fml_std_weight(height):
        standard_weight = (height - 100)*0.9 - 2.5
        return standard_weight

def debug_bmi(height, weight, gender):
        import pdb
        if _DEBUG == True:
                pdb.set_trace()
        if gender != 'male' and gender !='female':
                print("input error")
        elif gender == 'male':
                standard_weight = ml_std_weight(height)
        else:
                standard_weight = fml_std_weight(height)
        if weight <= (standard_weight*0.9):
                print ("You BMI is -1")
        elif  weight <(standard_weight*1.1):
                print ("You BMI is 0")
        elif  weight <(standard_weight*1.2):
                print ("You BMI is 1")
        elif  weight <(standard_weight*1.3):
                print ("You BMI is 2")
        elif  weight <(standard_weight*1.5):
                print ("You BMI is 3")
        else:
                print ("You BMI is 4")

if __name__ == "__main__":
    debug_bmi(160,60,'male')
```

python 语言程序设计

进入函数：s

```
> d:\python34\debug_bmi_function.py(14)debug_bmi()
-> if gender != 'male' and gender !='female':
(Pdb) l
  9
 10      def debug_bmi(height, weight, gender):
 11              import pdb
 12              if _DEBUG == True:
 13                      pdb.set_trace()
 14   ->         if gender != 'male' and gender !='female':
 15                      print("input error")
 16              elif gender == 'male':
 17                   standard_weight = ml_std_weight(height)
 18              else:
 19                   standard_weight = fml_std_weight(height)
(Pdb) b 16
Breakpoint 1 at d:\python34\debug_bmi_function.py:16
(Pdb) c
> d:\python34\debug_bmi_function.py(16)debug_bmi()
-> elif gender == 'male':
(Pdb) n
> d:\python34\debug_bmi_function.py(17)debug_bmi()
-> standard_weight = ml_std_weight(height)
(Pdb) s
--Call--
> d:\python34\debug_bmi_function.py(2)ml_std_weight()
-> def ml_std_weight(height):
(Pdb)
```

进入函数内部，查看变量p

```
(Pdb) s
--Call--
> d:\python34\debug_bmi_function.py(2)ml_std_weight()
-> def ml_std_weight(height):
(Pdb) n
> d:\python34\debug_bmi_function.py(3)ml_std_weight()
-> standard_weight = (height - 100)*0.9
(Pdb) p height
160
(Pdb) p standard_weight
*** NameError: name 'standard_weight' is not defined
(Pdb) n
> d:\python34\debug_bmi_function.py(4)ml_std_weight()
-> return standard_weight
(Pdb) p standard_weight
54.0
(Pdb)
```

返回函数调用处：r

```
(Pdb) r
--Return--
> d:\python34\debug_bmi_function.py(4)ml_std_weight()->54.0
-> return standard_weight
(Pdb) l
  1       _DEBUG = True
  2       def ml_std_weight(height):
  3             standard_weight = (height - 100)*0.9
  4   ->        return standard_weight
  5
  6       def fml_std_weight(height):
  7             standard_weight = (height - 100)*0.9 - 2.5
  8             return standard_weight
  9
 10       def debug_bmi(height, weight, gender):
 11              import pdb
(Pdb)
```

查看帮助：h

```
(Pdb) h

Documented commands (type help <topic>):
========================================
EOF     c          d        h         list      q        rv       undisplay
a       cl         debug    help      ll        quit     s        unt
alias   clear      disable  ignore    longlist  r        source   until
args    commands   display  interact  n         restart  step     up
b       condition  down     j         next      return   tbreak   w
break   cont       enable   jump      p         retval   u        whatis
bt      continue   exit     l         pp        run      unalias  where

Miscellaneous help topics:
==========================
pdb  exec

(Pdb)
```

pdb调试

- pdb 命令

命令	解释
break或b	设置断点
continue或c	继续执行程序
list或l	查看当前行的代码段
step或s	进入函数
return或r	执行代码直到从当前函数返回
exit或q	中止并退出
next或n	执行下一行
pp	打印变量的值
help	帮助