



*Multi-dimensional View of Python*

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# Python面面观

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用Python玩转数据

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# 异常

# 异常 (Exception)

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```
>>> 1 / 0
```

Traceback (most recent call last):  
File "<pyshell#9>", line 1, in <module>  
1/0  
ZeroDivisionError: division by zero



```
>>> y = x + 1
```

Traceback (most recent call last):  
File "<pyshell#12>", line 1, in  
<module>  
y = x + 1  
NameError: name 'x' is not defined

用异常对象 (exception object) 表示异常情况

- 查看异常类

```
>>> dir(__builtins__)
```

类 名	描 述
BaseException	所有异常的基类
Exception	常规异常的基类
AttributeError	对象不存在此属性
IndexError	序列中无此索引
IOError	输入/输出操作失败
KeyboardInterrupt	用户中断执行(通常输入Ctrl-C)
KeyError	映射中不存在此键
NameError	找不到名字(变量)
SyntaxError	Python 语法错误
TypeError	对类型无效的操作
ValueError	传入无效的参数
ZeroDivisionError	除(或取模)运算的第二个参数为0

```
if y != 0:  
    print(x / y)  
else:  
    print('division by zero')
```

**try-except**



```
# Filename: exception1.py
num1 = int(input('Enter the first number: '))
num2 = int(input('Enter the second number: '))
print(num1 / num2)
```

Enter the first number: a

Traceback (most recent call last):

File "C:\Python\programs\exception1.py", line 1, in <module>

num1 = int(input('Enter the first number: '))

ValueError: invalid literal for int() with base 10: 'a'

# try-except语句

F<sub>ile</sub>

# Filename: exception2.py

try:

```
num1 = int(input('Enter the first number: '))
num2 = int(input('Enter the second number: '))
print(num1 / num2)
```

except ValueError:

```
print('Please input a digit!')
```

try:

raise

except Exception as err:

```
print(err)
```

F<sub>ile</sub>

# Filename: exception3.py

try:

```
num1 = int(input('Enter the first number: '))
num2 = int(input('Enter the second number: '))
print(num1 / num2)
```

except ZeroDivisionError as err:

```
print('The second number cannot be zero!')
print(err)
```

# 多个except子句和一个except块捕捉多个异常

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File

# Filename: exception4.py

try:

num1 = int(input('Enter the first number: '))

num2 = int(input('Enter the second number: '))

print(num1 / num2)

except ValueError:

print('Please input a digit!')

except ZeroDivisionError:

print('The second number cannot be zero!')

File

# Filename: exception5.py

try:

num1 = int(input('Enter the first number: '))

num2 = int(input('Enter the second number: '))

print(num1 / num2)

except (ValueError, ZeroDivisionError):

print('Invalid input!')



# 空except子句和as

F<sub>ile</sub>

# Filename: exception6.py

try:

num1 = int(input('Enter the first number: '))

num2 = int(input('Enter the second number: '))

print(num1 / num2)

except:

print('Something went wrong!')

F<sub>ile</sub>

# Filename: exception7.py

try:

num1 = int(input('Enter the first number: '))

num2 = int(input('Enter the second number: '))

print(num1 / num2)

except Exception as err:

print('Something went wrong!')

print(err)

一了百了: except:

# else子句

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F<sub>ile</sub>

# Filename: exception8.py

try:

num1 = int(input('Enter the first number: '))

num2 = int(input('Enter the second number: '))

print(num1 / num2)

except(ValueError, ZeroDivisionError):

print('Invalid input!')

else:

print('Aha, everything is OK.')

Enter the first number: 3

Enter the second number: 5

0.6

Aha, everything is OK.

File

# Filename: exception9.py

while True:

try:

num1 = int(input('Enter the first number: '))

num2 = int(input('Enter the second number: '))

print(num1 / num2)

break

except ValueError:

print('Please input a digit!')

except ZeroDivisionError:

print('The second number cannot be zero!')

Enter the first number: a

Please input a digit!

Enter the first number: 3

Enter the second number: 0

The second number cannot be zero!

Enter the first number: 3

Enter the second number: 5

0.6

# break的位置

F<sub>ile</sub>

# Filename: exception10.py

while True:

try:

num1 = int(input('Enter the first number: '))

num2 = int(input('Enter the second number: '))

print(num1 / num2)

except Exception as err:

print(err)

else:

break

F<sub>ile</sub>

# Filename: exception11.py

aList = [1, 2, 3, 4, 5]

i = 0

while True:

try:

print(aList[i])

except IndexError:

print('index error')

break

else:

i += 1

# finally子句

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F<sub>ile</sub>

```
# Filename: exception12.py
```

```
def finallyTest():
```

```
    try:
```

```
        x = int(input('Enter the first number: '))
```

```
        y = int(input('Enter the second number: '))
```

```
        print(x / y)
```

```
    return 1
```

```
except Exception as err:
```

```
    print(err)
```

```
    return 0
```

```
finally:
```

```
    print('It is a finally clause.')
```

```
result = finallyTest()
```

```
print(result)
```

Enter the first number: 3

Enter the second number: 5

0.6

It is a finally clause.

1

Enter the first number: 3

Enter the second number: 0

division by zero

It is a finally clause.

0

# 上下文管理器 (Context Manager) 和with语句

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F<sub>ile</sub>

```
# Filename: exception13.py
try:
    f = open('data.txt')
    for line in f:
        print(line, end = "")
except IOError:
    print('Cannot open the file!')
finally:
    f.close()
```

F<sub>ile</sub>

```
# Filename: exception14.py
with open('data.txt') as f:
    for line in f:
        print(line, end="")
```

**with**语句和文件异常处理

try:

    with open('data.txt') as fp:

        ... # 各种文件和后续处理

except IOError as err:

    print(err)

定义和控制代码块执行前的准备动作及执行后的收尾动作