

A Short and Incomplete Introduction to Python

Part 6: Exception handling

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Exceptions

“Exceptions” is the name given in Python to error conditions.

You can write code that intercepts some error conditions and reacts appropriately.

See also: <http://docs.python.org/library/exceptions.html>

What does an exception look like?

```
>>> stream.write('foo')
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
IOError: File not open for writing
```

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Traceback (most recent call last):
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```

This is the exception *message*: it is supposed to be read by the (human) user.

What does an exception look like?

```
>>> stream.write('foo')
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
IOError: File not open for writing
```

This is the exception *class name*; it is used for catching exceptions (syntax in the next slide).

```
try:  
    # code that might raise an exception  
except SomeException:  
    # handle some exception  
except AnotherException as ex:  
    # the actual Exception instance  
    # is available as variable 'ex'  
finally:  
    # performed on exit in any case
```

The optional **finally** clause is executed on exit from the **try** or **except** block in *any* case.

Reference: http://docs.python.org/reference/compound_stmts.html#try

Common Exception types

ArithmeticError Catch-all class for all class of number manipulation errors.

IOError I/O error on open file.

IndexError Position `i` out of bounds in a sequence access like `L[i]`

KeyError Key `k` does not exist in a dictionary/mapping access like `D[k]`.

OSError A system call failed.

TypeError Argument of wrong type passed to function. For example: a `datetime` object passed to `int()` or `float()`.

ValueError Argument has the right type but an invalid value. For example: convert a string to integer but string does not contain a number.

For more, see:

<https://docs.python.org/3/library/exceptions.html>

Raising exceptions in your code

Use the **raise** statement with an `Exception` instance:

```
if an_error_occurred:  
    raise RuntimeError("Spider sense is tingling.")
```


Exercise 6.A: Try loading file `values2.txt` with the `load_data()` function from Exercise 4.A – what exception does Python raise?

Edit the `load_data()` function into a `load_data2()` that *ignores* any line that does not contain an integer number.

Bonus points if you can write `load_data2()` so that it has exactly the same output of `load_data()`, i.e. minimize the number of rejected input lines.

Exercise 6.B: Write a function `read_csv(p)` which reads a CSV (*Comma-Separated Values*) file and returns a list of all rows in it. A *row* will be represented as a Python list of (string) items.