

## Working with Objects in Python

### The Google API

There are many Python libraries around that do interesting things.

Some allow you to call web services like the one Google provides.

The pygoogle library is one such library.

Here's a simple example that uses the Python's pygoogle library.

```
import google
google.setLicense("H2delvNQFHI9ilswRXR1h1+7lqnD7Pp4")
data = google.doGoogleSearch('wolber') #
print data.results[0].URL
print data.results[0].title
```

The 'doGoogleSearch' function returns a complex object.

'data' catches it.

It has one field called results, which is itself a list of objects each having a URL and a title (and some other things).

For a full description of the the pygoogle Google API, see:

<http://pygoogle.sourceforge.net/dist/doc/index.html>

As the API documentation shows, doGoogleSearch returns an object of type SearchReturnValue. Here's the text from the API:

```
Returns:
the search results encapsulated in an object
    (type=SearchReturnValue)
```

SearchReturnValue has two fields:

```
meta: SearchResultsMetaData
results: list of SearchResult
```

'meta' is the name of the first part. Its type is 'searchResultsMetaData'. It contains information such as the total number of results for the query:

directoryCategories: list of categories for the search results  
documentFiltering: is duplicate page filtering active?  
endIndex: index of the last result returned (zero-based)  
estimatedTotalResultsCount: estimated results for this query.  
estimatedExact: is estimatedTotalResultsCount an exact value?  
searchComments: human-readable informational message  
searchQuery: search string that initiated this search  
searchTime: total search time, in seconds  
searchTips: human-readable informational message on how to better use Google.  
startIndex: index of the first result returned (zero-based)

**'results'** is the list of search results, as used in the example above. It contains a list of SearchResult. A SearchResult has:

cachedSize: size of cached version of this result, (KB)  
directoryCategory: Open Directory category information  
directoryTitle: Open Directory title of this result (or blank)  
hostName: used when filtering occurs  
relatedInformationPresent: is the "related:" keyword supported?  
snippet: snippet showing query context (HTML)  
summary: Open Directory summary for this result (or blank)  
title: title (HTML)  
URL: URL

You access the fields of an object using '.', e.g.,

```
data = google.doGoogleSearch('wolber')
print data.meta.estimatedTotalResultsCount
```

### **In-Class Problem**

1. Write a program that prints the url of the first five results from a search.
2. For your search, print the time it took to do a search

If you have any problems, you may need to get your own key:  
<http://code.google.com/apis/ajaxsearch/signup.html>