Unittest tutorial

practical exercise

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Assignment

Your assignment is to implement a missing unittest for the **phonebook** package.

Implement the **test_lookup** unit test inside the file **tests / test_dummydb_phonebook_layer.py**. Optionally implement the **test_unknown_command** inside the file **test / test_phonebook_terminal.py**. Note that this second test requires a bit more code reading and applies a more advanced use of the **Mock** class.

If you are interested in what the software does, try running the **phonebookterminal.py** (type help for instructions),

```
$ ./phonebookterminal.py

PHONE BOOK TERMINAL
v0.1.0
phonebook:
phonebook: insert Hrobjartur Thorsteinsson;Studlasel 24;4991911
phonebook: lookup Hrobjartur Thorsteinsson
Hrobjartur Thorsteinsson;Studlasel 24;4991911
phonebook:
phonebook: lookup Bolli Palmason
None
phonebook: exit
have a nice day!
$
```

The **phonebookterminal** software allows users to insert or lookup phonebook entries in a database.

Install software tools

The essential testing tools are the mock and nose package for python,

```
$ sudo apt-get install python-mock
$ sudo apt-get install python-nose
```

Optionally, if you want to compile UML diagrams or documentation,

```
$ sudo apt-get install graphviz
$ sudo apt-get install pylint
$ sudo apt-get install python-coverage
$ sudo apt-get install rst2pdf
```

Run the tests

The **nose** package includes a 'testrunner' called **nosetests**. The testrunner automatically looks up classes that derive from unittest.TestCase, executes the tests and reports a result.

Now execute all the tests found in the tests directory,

```
$ nosetests -v tests/
```

All but two tests should pass. Two tests have been defined but not yet implemented,

```
ERROR: test_lookup (test_dummydb_phonebook_layer.TestPhoneBookLayer)
ERROR: test_unknown_command (test_phonebook_terminal.TestPhoneBookTerminal)
```

Optionally use **coverage** to evaluate how well the tests are 'covering' the code,

```
$ nosetests -v --with-coverage tests/
$ coverage report

Name                                    Stmts   Miss Branch BrMiss  Cover
-------------------------------------------------------------------------
phonebook/__init__                          2      0      0      0   100%
phonebook/dummy_database                   15     10      2      2    29%
phonebook/dummydb_phonebook_layer          13      4      2      2    60%
phonebook/phonebook_layer_interface         7      2      0      0    71%
phonebook/phonebook_terminal               57     28     12      3    55%
phonebook/version                           4      0      0      0   100%
-------------------------------------------------------------------------
TOTAL                                      98     44     16      7    55%
```

The percentage coverage should improve somewhat after implementing the new tests.

Code structure

The software uses a database abstraction layer (http://en.wikipedia.org/wiki/Database_abstraction_layer) to hide the functionality of an actual database module.

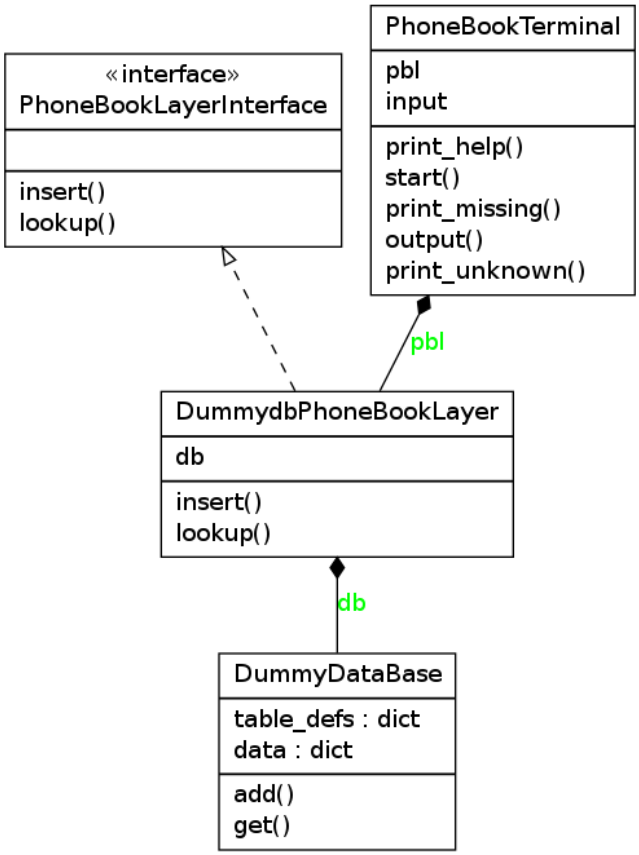
An abstraction layer is a 'programming pattern' that helps isolate your code from external libraries. This technique makes your code less dependent on those libraries by calling an intermediary layer.

In our case the database module being used is a demonstration module called **DummyDataBase**. Our abstraction from this database is called **DummydbPhoneBookLayer**, which implements an interface **PhoneBookLayerInterface**. The **PhoneBookTerminal** talks only to the **DummydbPhoneBookLayer**, which in turn talks to the **DummyDataBase**.

Class diagram

You can generate a UML class diagram for the code using **pyreverse** (shippes with pylint),

```
$ pyreverse -o png phonebook/*.py
```


«interface»
PhoneBookLayerInterface
insert()
lookup()
PhoneBookTerminal
pbl
input
print_help()
start()
print_missing()
output()
print_unknown()
pbl
DummydbPhoneBookLayer
db
insert()
lookup()
db
DummyDataBase
table_defs : dict
data : dict
add()
get()