1811ICT/2807ICT/7001ICT Programming Principles, Workshop 11

School of Information and Communication Technology

Griffith University

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| Goals | This workshop focusses on everything in the course up to classes. |
| When | Week 12 |

# Before your workshop class:

* Read the whole document.
* Review the lecture notes sections 1 to 26.

# Workshop activities

## Problem 1

*Problem:* An Internet Service Provider (ISP) must, as part of its service to customers, provide a Domain Name Server (DNS).

A DNS is a server that maintains a database of domain names, such as www.griffith.edu.au, and their corresponding Internet Protocol Addresses (IPA), such as 132.234.243.22. A domain name has only one IPA, but an IPA may have many domain names. 88.88.0.0

Define a class that simulates a DNS. It must have:

* a method for updating the DNS with a new domain name and its IPA;
* a method for returning the IPA for a domain name, or None if it does not exist; and
* whatever private attributes are required to support the methods.

Write a test program that allows the user to test the class, by typing in fake domain names and IPAs to update the DNS, and domain names to look up.

Example output from the test program:

|  |
| --- |
| ? u www.google.com 8.8.8.8  ? u www.amazon.com 2.2.2.2  ? u [www.cnn.com](http://www.cnn.com)  Bad command.  ? l www.google.com  8.8.8.8  ? l www.amazon.com  2.2.2.2  ? l www.cnn.com  None  ? q |

Where:

* u *DNS IPA* updates the DNS with a new domain name and its IPA;
* l *DNS* returns the IPA for a domain name, or None if it does not exist; and
* q ends the test program.

Bad inputs are to be reported and ignored.

*Testing:* Test your code with the example output above.

## Problem 2

*Problem:* The government now requires that DNSs should maintain a secret blacklist of IPAs that must not be returned, even if the domain name exists.

Without changing your DNS class from problem 1, define a new class that extends your old class, adding:

* a method for adding an IPA to the secret blacklist; and
* a private attribute for the blacklist. Hint: it may be called a black*list*, but is a Python list the most efficient data structure to use here?

You must also override the lookup method so that it returns None for blacklisted IPA, even if they do exist.

Write a test program that allows the user to test the new class.

Example output from the test program:

|  |
| --- |
| ? u www.google.com 8.8.8.8  ? u www.amazon.com 2.2.2.2  ? b 2.2.2.2  ? l www.google.com  8.8.8.8  ? l www.amazon.com  None  ? q |

Where:

* u *DNS IPA* updates the DNS with a new domain name and its IPA;
* b *IPA* adds the IPA to the secret blacklist;
* l *DNS* returns the IPA for a domain name, or None if it does not exist or is in the secret blacklist;
* q ends the test program.

Bad inputs are to be reported and ignored.

*Testing:* Test your code with the example output above.



You have an opportunity to ask questions in the workshop. Are there any concepts you are still struggling with? Are there any previous workshops’ questions that you are unsure about how to solve them and need some advice?