2807/7001ICT Programming Principles (I), Trimester 1, 2020 Workshop 11

School of Information and Communication Technology
Griffith University

May 4, 2020

Module	4
When	Week 11
Goals	The last workshop exercises will require inheritance.
Marks	5
Due	All work (pre-workshop questions and problems) due by electronic submission on Learning@Griffith, at end of day, Friday 22/05/2020.

1 Preparation

Before your workshop class:

- Read all of this document.

- Review the lecture notes sections 1 to 25.

- Bring some paper (a print-out of this document is best) and writing implements.

- Bring a storage device, such as a portable hard drive and cable, or a USB drive.

2 Electronic submission

Due to the COVID-19 situation we are moving to electronic submission of workshops. Please submit a zip (not rar or any other format) file containing folders with names "questions", "problem1", "problem2, ... Question answers must be labelled. Put your solution files for each problem in the correct folder. The folders may be the folders created as projects for PyCharm or other IDE.

3 Pre-workshop questions (1 mark)

Complete these questions in writing *before* the start of the workshop. They will be marked early in the workshop.

1. Describe the relationship between a class and an object.

2. Describe the relationship between a reference and an object.

3. What are the members of a class?

4. What are the instances of a class?

5. A class definition begins:

```
class A (B):
```

Which one is the superclass and which one is the subclass?

4   Workshop activities

4.1   Marking last workshop's problems

If you have problems that still need marking from the previous workshops, get them marked at the *start* of this one.

4.2   Problem 1 (2 marks)

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.

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.

4.3   Problem 2 (2 marks)

Problem: The government now requires that DNSs should now 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.

5   After the workshop

- You have created programs that might be useful to refer back to in future workshops. Make sure that you will have that work in the future. One copy is not enough for at IT professional. You should have at least 2 copies:

    1. on your Griffith network storage drive; and
    2. on your portable storage device.