# COM102 Object Oriented Programming Coursework 2

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Evidence of the adoption of object-oriented principles:

This document outlines the design and development decisions made during the creation of the Pet Clinic Management System. The system is designed to manage pet information for a veterinary clinic, providing functionalities to add, modify, remove, list, and search for pets, as well as generate reports and save the data to disk.

The program is designed around the object-oriented principles, ensuring code reusability.

Each class encapsulates its data. For example, the Pet class encapsulates key pet attributes such as name, age, colour, and weight. Where access to these attributes is controlled through defined methods, ensuring data integrity and preventing unintended modification.

The Pet class serves as an abstraction, defining the common properties and behaviours shared by all pets. This abstraction allows us to represent any type of pet, in this program, it’ll be cats and dogs, focusing on the essential characteristics.

The ‘Cat’ and ‘Dog’ classes both inherit from the ‘Pet’ class, creating a inheritance hierarchy, where ‘Pet’ is the superclass, and ‘Cat’ and ‘Dog’ are the subclasses. The subclasses inherit the attributes and methods of the superclass class, extending them with their own specific characteristics. For example, the Cat and Dog classes each include a breed attribute, and provide their own implementations of the speak() method.

Polymorphism is effectively demonstrated in the program through the ‘speak()’ method. The ‘Pet’ class declares the method ‘speak()’, creating a common interface where all the different types of pets have a verbalised output. Then the ‘Cat’ and ‘Dog’ classes override the ‘speak()’ method, returning their specific implementation that correspond to the specific animal. This polymorphic behaviour allows the ‘Clinic’ class to interact with the ‘Pet’ objects without needing to specify the type of pet.