**Course: Introduction to Data Science (DS2006) - Laboratory 11**

**Student:**

**Activities using a new filename named** [**abstract-animals.py**](http://abstract-animals.py)

**Task 1**: Create the file and implement the code shown in the Slides from Lecture 09. The one that has the **abstract class** **Animal**, and the concrete classes **Dog**, **Cat**, **Rabbit** and **Owner**.

**Task 2:** Create two, three and five instances of **Dog**, **Cat** and **Rabbit** in any order you want. Each cat or dog should have one specific owner while the rabbits have none. Make sure you call either the **speak** or **sleep** method of each animal. Print the results of the code running here.

One of the motivations for using **abstract classes** is that it becomes easier to add new classes. Using the same code:

* **Task 3:** Decide on a new animal to Add a **new animal** to your code and write the **appropriate** **speak method** for it.
* **Task 4:** Draw the UML-like diagram to represent the existing relationships (e.g. attributes, methods) between the class you created and the other classes related to animals: **Animal**, **Dog, Cat** and **Rabbit**.
* **Task 5:** Show that your implementation works, create 2 objects of the class you created for this Animal and call its **methods**.

**Task 6:** Write a new **class** for **Staff**. Which attributes and methods should it have? Fully Implement this new class and write the code to show that it works.

**Activities using a new filename named** [**refactored-animals.py**](http://refactored-animals.py)

**Task 7:** As you probably guessed there are common attributes in the classes **Owner** and **Staff**. Refactor the code to have an **abstract class** named **Person** from which both **Staff** and **Owner** are subclasses. I.e. they will inherit the attributes and methods common to both classes from it.

**Task 8:** Draw the UML-like diagram to represent the existing relationships (e.g. attributes, methods) between the classes **Owner**, **Staff** and **Person**.