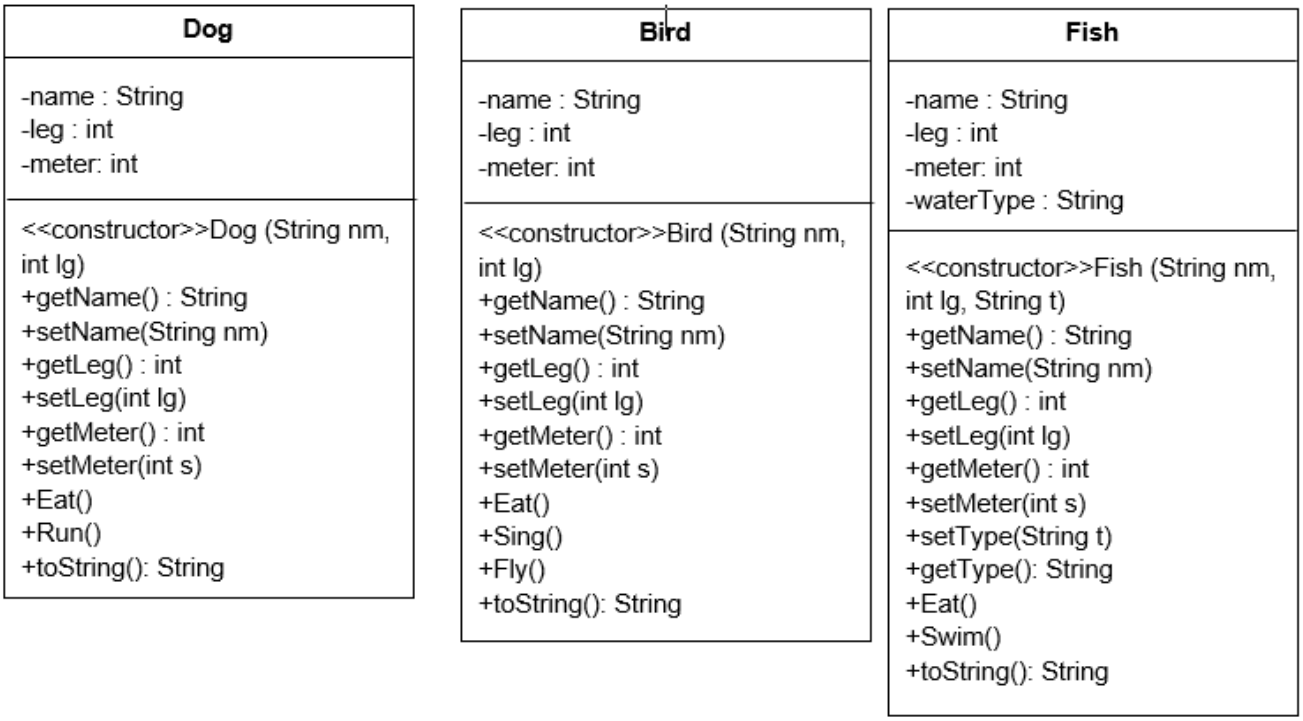
Lab Exercise (Chapter 9: Part 1)

Exercise 1: Inheritance (*is-a* relationship)

Q 1: Given the requirement to create each animal classes as shown below:



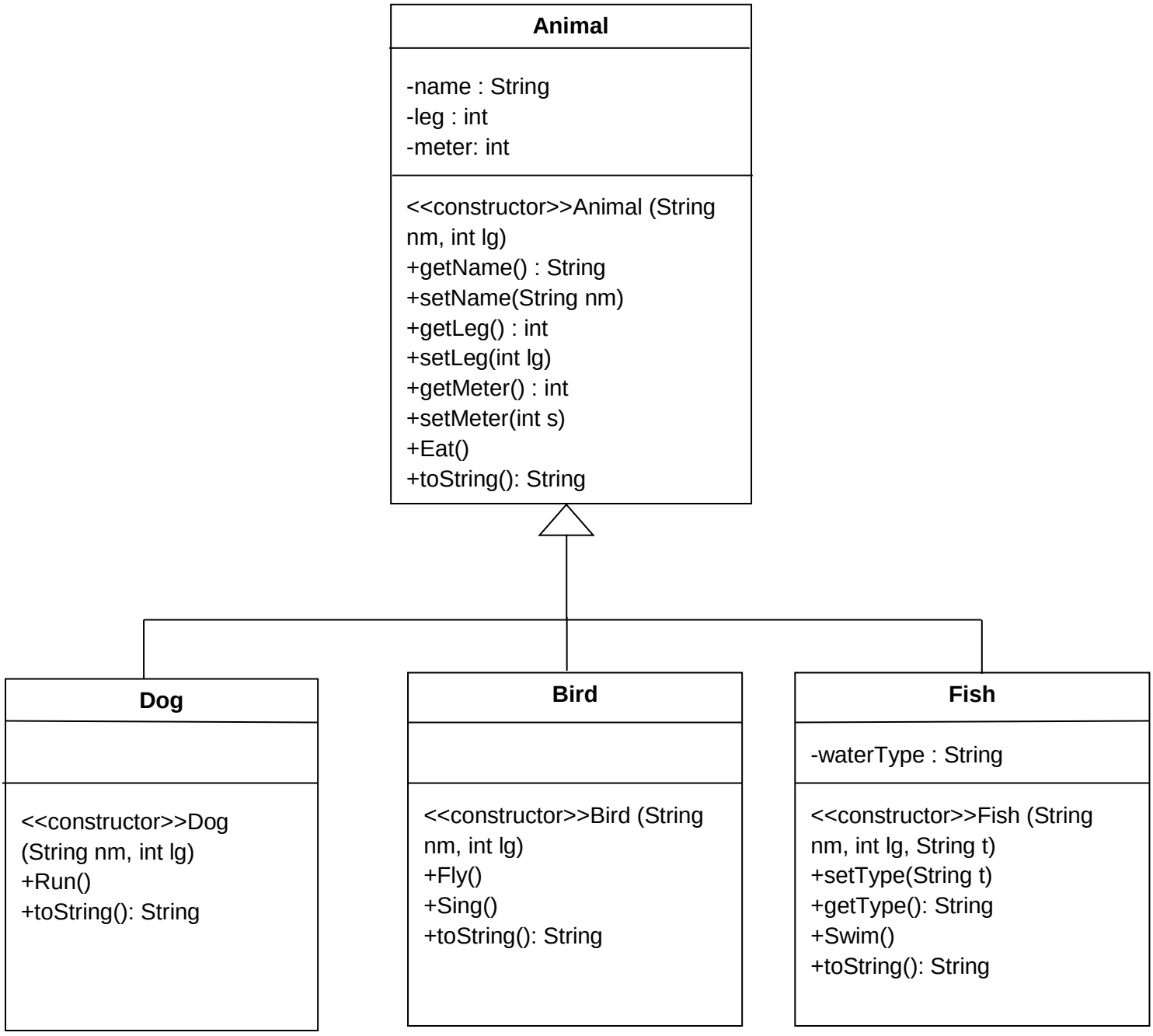
Create the classes: Animal, Dog, Bird, Fish.

1. Set the meter to 0 by default. Implement the method in each of the specific animal classes. Where Dog should print out 'Run *m* meter', Bird should print out 'Fly *m* meter' and Fish should print out 'Swim *m* meter'.
2. The Fish watertype should accept value for e.g. Fresh / Salt

Create a test program 'TestAnimal' to create the object for all the animals and test out the animals, let all the animals eat, let each of the animal move by their own customized actions (e.g. run, fly, swim). Then print the output.

Q 2: Can you improve the code by using inheritance?

You can create a general parent (a.k.a superclass) for all the animals to inherit from. Rewrite your coding with inheritance relationship as shown in UML diagram below. Create the Animal class and made the Dog, Bird and Fish the subclasses for the Animal superclass.



Q 3: Can you improve the code with overriding and Polymorphism?
(*Note: Polymorphism will be covered in next week Lecture*)

Next, you are required to enhance your implementation by introducing the 'Move' method in the parent class with parameter *m*, which is going to move the animal by *m* meter, then replace the run, fly and swim method by **overriding** the 'Move' method in each of the specific animal classes.

Then in the 'TestAnimal' program, move all the animals by 10 meters using an Animal array list. And, further improve your program by checking if it's a 'Salt' water fish, move it by 50 meters. And, if it's a dog move it by 20 meters.