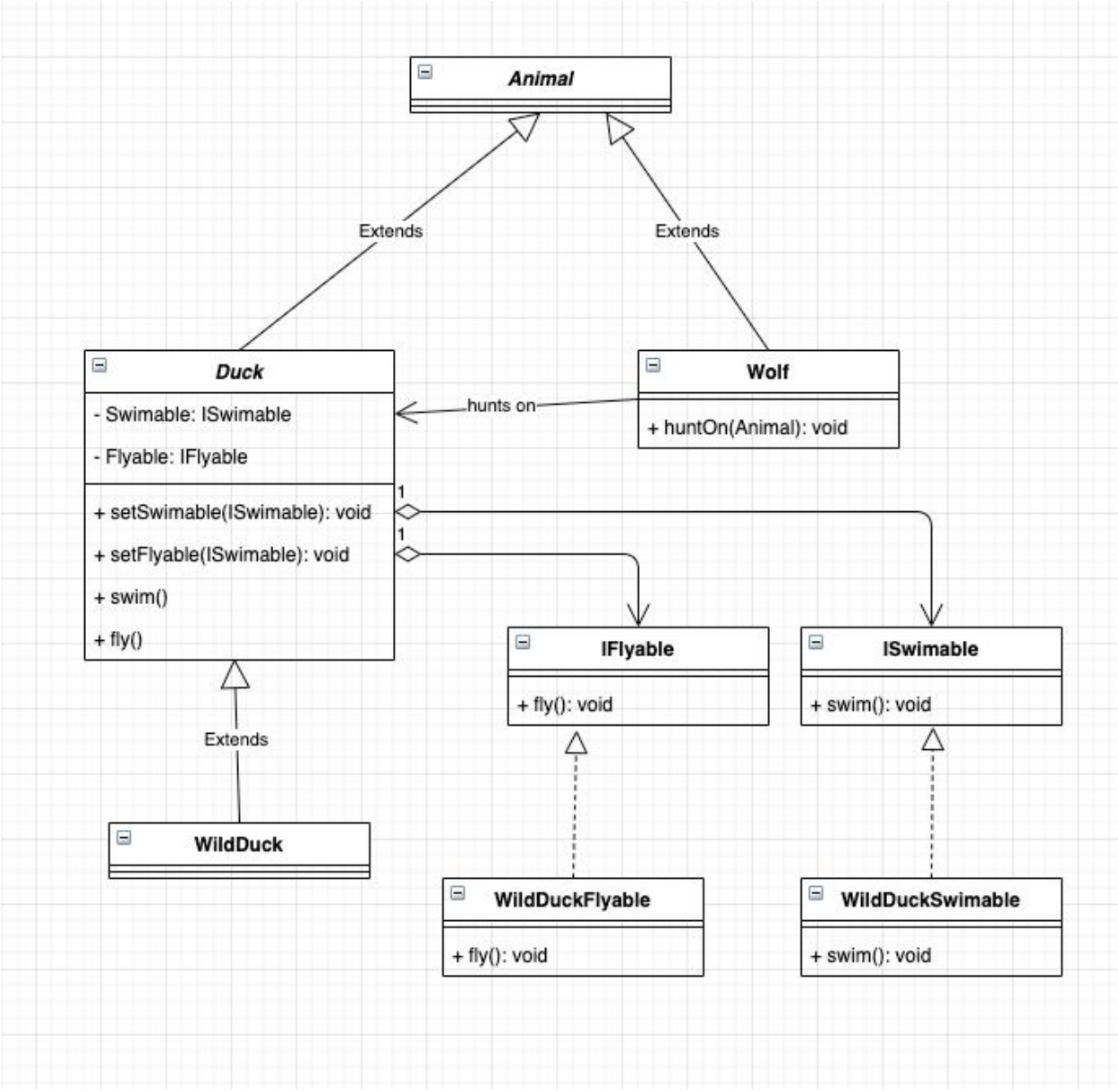
Final Exam (version 1)

1.

Implement a class model for the UML diagram below



Methods **swim**, **fly**, **huntOn** in **WildDuckFlyable**, **WildDuckSwimable** and **Wolf** classes should output text of what action was executed.

Methods **fly** and **swim** for **Duck** class should look like:

```
public void fly(){
    this.Flyable.fly();
}

public void swim(){
    this.Swimable.swim();
}
```

2.

Download source code for Task 2 and draw a UML diagram for that.

3.

Imagine a class model for Multimedia System that controls music and lights.
In addition, has remote control with the following buttons:

- Play rock music
- Play pop music
- Play Chill music
- Increase Volume (have input parameter, amount of unit volume should be increased)
- Decrease Volume (have input parameter, amount of unit volume should be decreased)
- Turn on lights
- Turn off Lights
- Turn on backlights
- Turn off backlights

Class model should support reprogramming your buttons, so it is possible to play pop music by pressing the “Play rock music” button.

Also remote control should have button:

- Chilling mode

By pressing it system should do the following:

- Set volume to 15
- Turn off the lights
- Turn on the backlights
- Play chill music

Create a class model above by using two or three design patterns you know.

Methods should just output text what commands were executed.

4 (Extra Task- 20 points).

1. What is a difference between Association, Aggregation and Composition in UML class diagram notation? (5 points)
2. Explain Liskov substitution principle in detail. Provide an example of violation of Liskov's principle and the way of fixing it. (5 points)
3. Which pattern defines a placeholder for another object without changing its interface? (5 points)
4. When is it better to use abstract class instead of the interface? (5 points)