

NAME & Id: _____ .

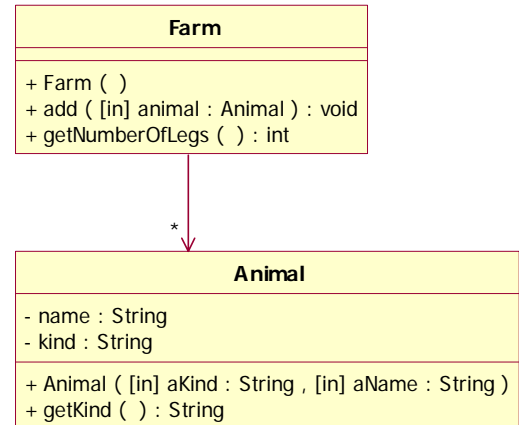
Q1 Consider the following system. Can you spot a bad smell in Farm.getNumLegs()? Can you fix it? Apply Larman's GRASP principles of **Information Expert** and **Polymorphism** (refer to the appropriate sections in the course text). For your solution: draw a UML class diagram and write the code for Farm.getNumLegs (as well as any new code that you need to introduce).

```
public class FarmTest extends ...{
    public void testGetNumLegs() {
        Farm f = new Farm();
        f.add(new Animal("Duck",
            "Donald"));
        assertEquals(2, f.getNumLegs());
        f.add(new Animal("Dog", "Pluto"));
        assertEquals(6, f.getNumLegs());
    }
}
```

```
public class Animal {
    private String name;
    private String kind;

    public Animal(String aKind,
        String aName) {
        kind = aKind;
        name = aName;
    }

    public String getKind() {
        return kind;
    }
    ...
}
```



```
public class Farm {
    public int getNumLegs() {
        int result = 0;
        Iterator it = animals.iterator();
        while(it.hasNext()) {
            Animal a = (Animal) it.next();
            if(a.getKind().equals("Duck")) {
                result += 2;
            } else if(a.getKind().equals(
                "Dog")) {
                result += 4;
            } else {
                // ?
            }
        }
        return result;
    }
}
```