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## Lecture 24: Programming with Subclasses

CS 1110  
Introduction to Computing Using Python

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### Put Me in the Zoo

- Classes: Animal, Bird, Fish, Penguin, Parrot
- Instances can swim, fly, and speak based on class membership
- Track:
  - # of animals created
  - name, tag #, weight for each animal (w/default weights)
- Methods:
  - print words if animal speaks
  - animal eats: print eating sounds and gain 1 pound

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### Questions to ask

- What does the class hierarchy look like?
- What are class attributes? What are instance attributes? What are constants?
- What does the `__init__` function look like?
- How do we support default weights?
- How do we implement the class methods?
- What does a "stringified" Animal look like? `str(a)`

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### speak(words)

If `speak` is defined by the `Animal` Class like this:

```
def speak(self, words):
    if self.CAN_SPEAK:
        print(words)
```

Q2: Which subclasses need to provide their own version of this method?

A: Bird, Fish, Penguin, and Parrot  
 B: Bird and Parrot  
 C: just Parrot  
 D: none  
 E: I don't know

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If `eat` is defined by the `Animal` Class like this:

```
def eat(self):
    print("NOM NOM NOM")
    self.weight += 1
```

Q3: We want Fish to say nothing and Birds to make a pecking sound. Which subclasses need to provide their own version of this method?

A: Bird, Fish, Penguin, and Parrot  
 B: Bird and Fish  
 C: just Bird  
 D: just Fish  
 E: I don't know

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