

# Quiz Preparation for Week 6

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*function and method: interchangeable*

*variable and field: interchangeable*

*instance and object: interchangeable*

## Concepts - Class and Object

- Static function/variable (09/28)
- Inheritance (09/29)
- Polymorphism (09/30)
  - up/down casting

## Warm-ups problems

- Static function/variable
  1. What is a static function for a class? What's its difference from an instance function?
  2. A static function can/cannot do \_\_\_\_\_?
  3. What does keyword *final* do?
- Inheritance
  4. Bird is a type of animal. A chick is a bird. A penguin is a bird. Declare four classes to reflect their relationships.
  5. What is the keyword for invoking parent class constructor?
  6. Given the following class declarations, what variable(s) can Bird access from Animal?

```
public class Animal {  
    public int one;  
    private int two;  
    protected int three;  
}  
public class Bird extends Animal {  
    // things  
}
```

7. How do you override a function from the parent class?
- Polymorphism
    8. Identify the error in the following codes:

```
public class Bird { }  
public class Penguin extends Bird { }  
  
void isPenguin(Penguin d) { /* do nothing */}  
  
Bird b = new Bird();  
Penguin p = new Penguin();  
isPenguin(b);
```

9. What is upcasting? Given the following codes, what can Penguin be upcast to?

```
public class Animal { }  
public class Bird extends Animal { }  
public class Penguin extends Bird { }
```

10. Assume we have some Bird b = new Penguin(). If we have a function swim() defined in the Penguin class, will `b.swim()` throws an error? Why?

## Combining it all together!