

FRC Java

Lesson 4

Object Oriented Paradigm

Objects, Classes, Fields, Methods

Gus Michel III

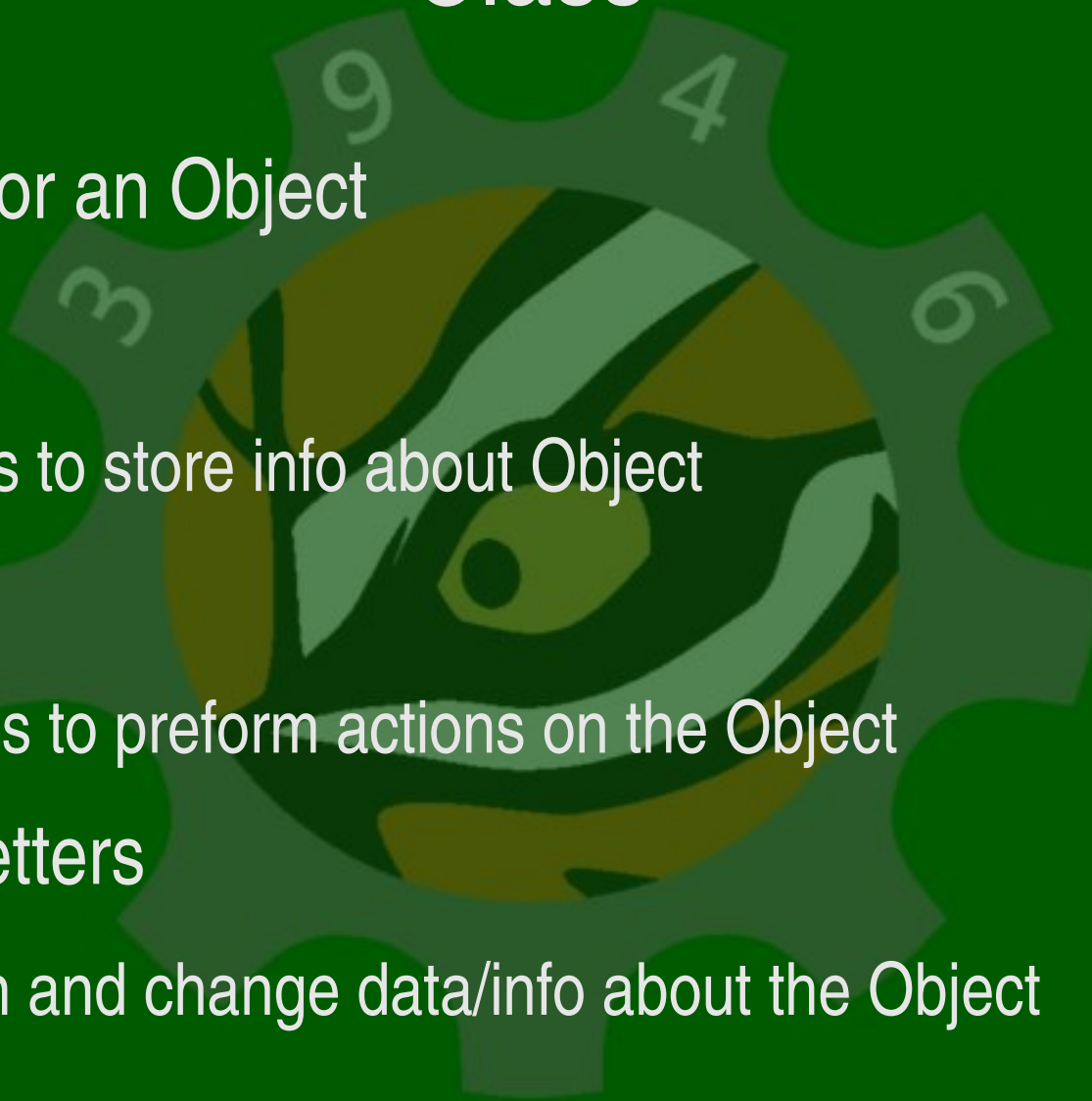
3946 Tiger Robotics – slidell-robotics.com

Objects

- Objects have State and Behaviors (take a dog)
 - State – color, breed, size, name, bark frequency
 - Behavior – bark, sleep, fetch, eat, run
- Everything except basic variable types.
 - String is an object
 - System.out is an object
- Also able to selectively:
 - change and/or return data

Class

- Blueprint for an Object
- Fields
 - Variables to store info about Object
- Methods
 - Functions to perform actions on the Object
- Getters/Setters
 - To return and change data/info about the Object



Fields

- Equivalent to State in previous slide
- Variables/Objects that hold data for the class
- Examples for the Dog object
 - `private String name;`
 - `private int barFrequency;`
 - `private int size;`
 - `private String breed;`

Methods

- Behaviors – functions or actions of the object
- `<status> <return> <name>(<param>) {<code>}`
- Examples for Dog object
 - `public void bark() { }`
 - `public void fetch() { }`
 - `public void eat() { }`
 - `public void run() { }`
- Constructor – sets up class
 - No return type
 - Name is name of Class

Getters and Setters

- Setters – Methods that changes fields

```
public void setName(String newName) {  
    name = newName;  
}
```

- Getters – Methods that return fields

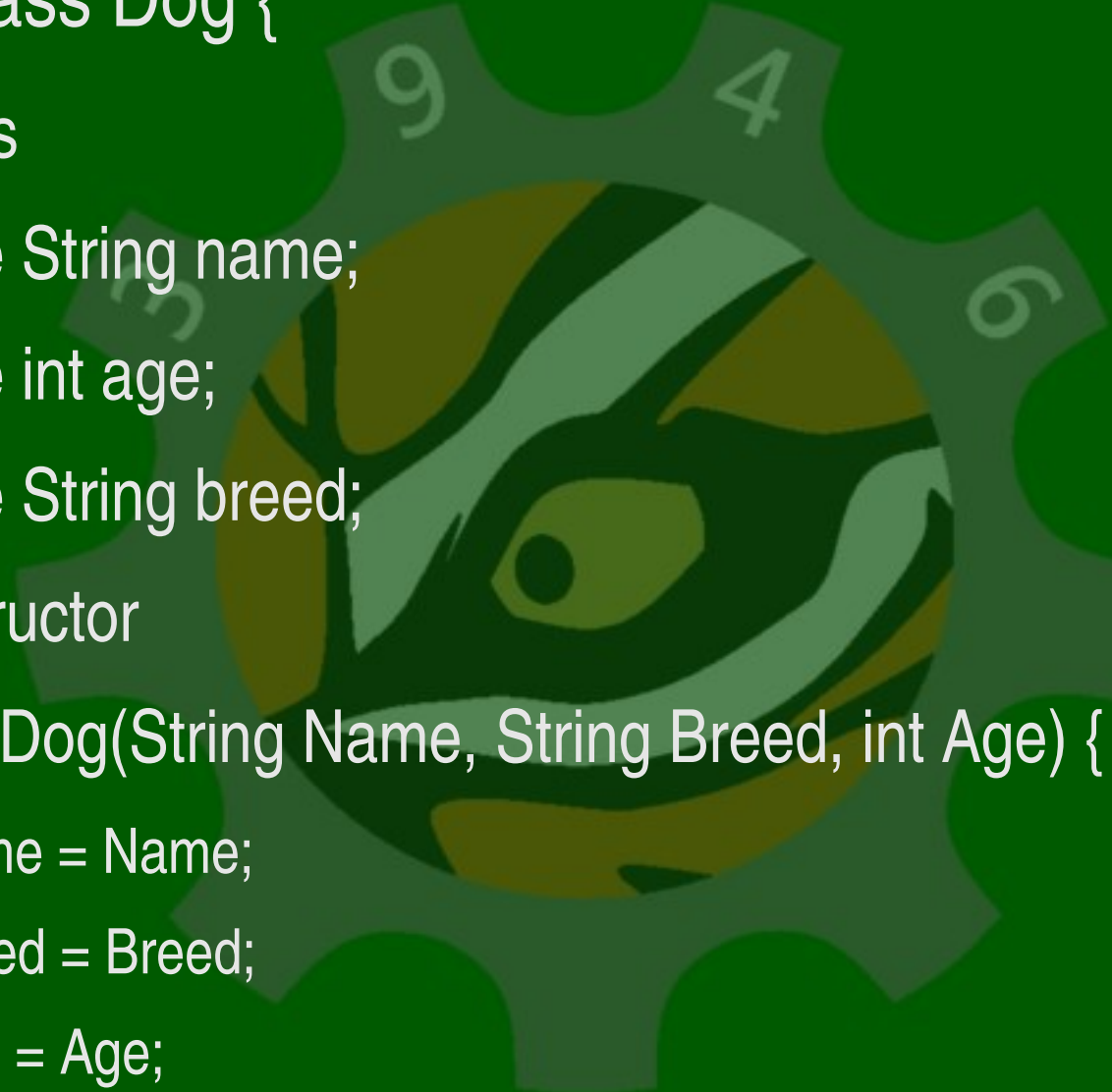
```
public String getName() {  
    return name;  
}
```

Public and Private

- Public – It can be accessed outside the class
 - If field is public, a getter or setter isn't needed
- Private – only accessible inside the class
- Methods, Fields and Classes have to have one of these.
- There's also Protected, it pertains to packages

Dog Class

```
public class Dog {  
    //Fields  
    private String name;  
    private int age;  
    private String breed;  
    //Constructor  
    public Dog(String Name, String Breed, int Age) {  
        name = Name;  
        breed = Breed;  
        age = Age;  
    }  
}
```



//Methods

```
public void bark() {
```

```
    System.out.println("bark!");
```

```
}
```

```
public Stick fetch() {
```

```
    Stick stick = new stick("wood");
```

```
    return stick;
```

```
}
```

```
public void eat() {
```

```
    DogFood dogFood = new DogFood();
```

```
    dogFood.serve();
```

```
}
```



//getters/setter

```
public String getName() {  
    return name;  
}
```

```
public int getAge() {  
    return age;  
}
```

```
public String getBreed() {  
    return breed;  
}
```

```
public void setName(String Name) {  
    name = Name;  
}
```

```
}
```

