# Keywords static, and final

Shirley B. Chu

June 17, 2020

De La Salle University College of Computer Studies

Instance variables are variables declared inside the class.
 These variables (often called attributes) belong to each object of this class that we create.

- Instance variables are variables declared inside the class.
   These variables (often called attributes) belong to each object of this class that we create.
- Instance methods are methods declared inside the class.
   These methods belong to each object of this class that we create.

- Instance variables are variables declared inside the class.
   These variables (often called attributes) belong to each object of this class that we create.
- Instance methods are methods declared inside the class.
   These methods belong to each object of this class that we create.

```
MyPuppy
        String
name:
weight: int
MyPuppy()
MyPuppy(n : String, w:
                         int)
MyPuppy(name:
                String)
         void
          int)
            String
getWeight () :
                int
setName (name:
                String):
                           void
```

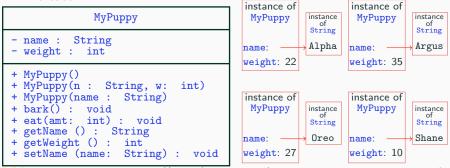
- Instance variables are variables declared inside the class.
   These variables (often called attributes) belong to each object of this class that we create.
- Instance methods are methods declared inside the class.
   These methods belong to each object of this class that we create.

```
MyPuppy
        String
name:
weight : int
MyPuppy()
MyPuppy(n : String, w:
                         int)
MyPuppy(name:
                String)
         void
          int)
            String
getWeight () :
                int
setName (name:
                String):
                           void
```

- Instance variables are variables declared inside the class.
   These variables (often called attributes) belong to each object of this class that we create.
- Instance methods are methods declared inside the class.
   These methods belong to each object of this class that we create.

```
MyPuppy
        String
name:
weight: int
MyPuppy()
MyPuppy(n : String, w:
                         int)
MyPuppy(name:
                String)
         void
          int)
             String
getWeight ():
                int
setName (name:
                String):
                           void
```

- Instance variables are variables declared inside the class.
   These variables (often called attributes) belong to each object of this class that we create.
- Instance methods are methods declared inside the class.
   These methods belong to each object of this class that we create.



• *Class variables* are declared as static.

- Class variables are declared as static.
- They are loaded in memory once the class is loaded.

- Class variables are declared as static.
- They are loaded in memory once the class is loaded.
- If visible, they may be accessed without creating an instance of the class, by using the class name.

- Class variables are declared as static.
- They are loaded in memory once the class is loaded.
- If visible, they may be accessed without creating an instance of the class, by using the class name.
- These variables are common to all objects of this class.

- Class variables are declared as static.
- They are loaded in memory once the class is loaded.
- If visible, they may be accessed without creating an instance of the class, by using the class name.
- These variables are common to all objects of this class.
- In the UML diagram, these are <u>underlined</u>.

```
MyPuppy
 name: String
- weight : int
+ MyPuppy()
+ MyPuppy(n : String, w:
                          int)
+ MyPuppy(name :
                 String)
 bark(): void
+ eat(amt: int) : void
+ getName () : String
+ getWeight () : int
+ setName (name: String): void
```

```
MyPuppy
- name : String
- weight : int
- count : int = 0
+ MyPuppy()
+ MyPuppy(n : String, w:
                          int)
+ MyPuppy(name :
                 String)
 bark(): void
+ eat(amt: int) : void
+ getName () : String
+ getWeight () : int
+ setName (name:
                 String) : void
```

```
MyPuppy
- name : String
- weight : int
- count : int = 0
+ MyPuppy()
+ MyPuppy(n : String, w:
                          int)
+ MyPuppy(name :
                 String)
 bark(): void
+ eat(amt: int) : void
+ getName () : String
+ getWeight () : int
+ setName (name:
                 String) : void
```

• Class methods are declared as static.

- Class methods are declared as static.
- They are loaded in memory once the class is loaded.

- *Class methods* are declared as static.
- They are loaded in memory once the class is loaded.
- If visible, they may be invoked without creating an instance of the class, by using the class name.

- Class methods are declared as static.
- They are loaded in memory once the class is loaded.
- If visible, they may be invoked without creating an instance of the class, by using the class name.
- These methods are common to all objects of this class.

- *Class methods* are declared as static.
- They are loaded in memory once the class is loaded.
- If visible, they may be invoked without creating an instance of the class, by using the class name.
- These methods are common to all objects of this class.
- In the UML diagram, these are underlined.

- *Class methods* are declared as static.
- They are loaded in memory once the class is loaded.
- If visible, they may be invoked without creating an instance of the class, by using the class name.
- These methods are common to all objects of this class.
- In the UML diagram, these are underlined.
- Class methods are used to access class variables.

- *Class methods* are declared as static.
- They are loaded in memory once the class is loaded.
- If visible, they may be invoked without creating an instance of the class, by using the class name.
- These methods are common to all objects of this class.
- In the UML diagram, these are <u>underlined</u>.
- Class methods are used to access class variables.

Some rules to take note of Rules

```
MyPuppy
 name: String
 weight : int
 count : int = 0
+ MyPuppy()
+ MyPuppy(n : String, w:
                         int)
+ MyPuppy(name:
                 String)
+ bark() : void
 eat(amt: int) : void
 getName () : String
+ getWeight () : int
+ setName (name:
                 String):
                          void
```

```
public class MyPuppy
    private static int count = 0;
    private String name;
    private int weight;
```

```
MyPuppy
 name: String
 weight : int
 count : int = 0
+ MyPuppy()
 MyPuppy(n : String, w:
                          int)
+ MyPuppy(name:
                 String)
+ bark() : void
 eat(amt: int) : void
 getName () : String
 getWeight () : int
 setName (name:
                 String) : void
+ getCount () : int
```

```
public class MyPuppy
    private static int count = 0;
    private String name;
    private int weight;
```

```
MyPuppy
 name: String
 weight : int
 count : int = 0
+ MyPuppy()
 MyPuppy(n : String, w:
                          int)
+ MyPuppy(name:
                 String)
+ bark() : void
 eat(amt: int) : void
 getName () : String
+ getWeight () : int
 setName (name:
                 String) : void
+ getCount () : int
```

```
public class MyPuppy
    private static int count = 0;
    private String name;
    private int weight;
    public static int getCount ()
        return count;
```

# Using class variables

```
MyPuppy
 name: String
 weight : int
 count : int = 0
+ MyPuppy()
+ MyPuppy(n : String, w:
                          int)
+ MyPuppy(name :
                 String)
+ bark() : void
+ eat(amt: int) : void
+ getName () : String
+ getWeight () : int
+ setName (name: String): void
+ getCount () : int
```

```
public class MyPuppy
    public MyPuppy ()
        name = "puppy";
        weight = 10;
    public MyPuppy (String name)
        this ();
        this.name = name:
    public MyPuppy (String n, int w)
        name = n:
        this.weight = w;
```

# Using class variables

```
MyPuppy
 name: String
 weight : int
 count : int = 0
+ MyPuppy()
 MyPuppy(n : String, w:
                          int)
+ MyPuppy(name:
                 String)
+ bark() : void
 eat(amt: int) : void
 getName () : String
+ getWeight () : int
 setName (name: String) : void
+ getCount () : int
```

```
public class MyPuppy
    public MyPuppy ()
        name = "puppy";
        weight = 10;
        count++:
    public MyPuppy (String name)
        this ();
        this.name = name;
    public MyPuppy (String n, int w)
        name = n;
        this.weight = w;
```

# Using class variables

```
MyPuppy
 name :
         String
 weight: int
 count : int = 0
+ MyPuppy()
+ MyPuppy(n : String, w:
                         int)
 MyPuppy(name:
                 String)
+ bark() : void
+ eat(amt: int) : void
 getName () : String
 getWeight () : int
+ setName (name: String): void
 getCount () : int
```

```
public class MyPuppy
    public MyPuppy ()
        name = "puppy";
        weight = 10;
        count++:
    public MyPuppy (String name)
        this ();
        this.name = name;
    public MyPuppy (String n, int w)
        name = n;
        this.weight = w;
        count++:
```

Constants can be defined by declaring it final, e.g.
 public final int SIZE = 30;

Constants can be defined by declaring it final, e.g.

public final int SIZE = 30;

 Naming convention for constants: nouns or noun phrases; all uppercase letters separated by underscores

Constants can be defined by declaring it final, e.g.

```
public final int SIZE = 30;
```

- Naming convention for constants: nouns or noun phrases; all uppercase letters separated by underscores
- In the UML diagram, these are encoded in all uppercase letters

Constants can be defined by declaring it final, e.g.

```
public final int SIZE = 30;
```

- Naming convention for constants: nouns or noun phrases; all uppercase letters separated by underscores
- In the UML diagram, these are encoded in all uppercase letters

```
MyPuppy
 name: String
- weight : int
- count : int = 0
+ MyPuppy()
+ MyPuppy(n : String, w:
                          int)
 MyPuppy(name : String)
 bark() : void
+ eat(amt: int) : void
+ getName () : String
+ getWeight () :
                int
+ setName (name: String): void
 getCount () : int
```

```
MyPuppy
- name : String
- weight : int
- count : int = 0
+ RATE : int
+ MyPuppy()
                          int)
+ MyPuppy(n : String, w:
 MyPuppy(name : String)
 bark(): void
+ eat(amt: int) : void
+ getName () : String
+ getWeight () :
                 int
+ setName (name:
                 String) : void
 getCount () : int
```

```
MyPuppy
- name : String
- weight : int
- count : int = 0
+ RATE : int
+ MyPuppy()
+ MyPuppy(n : String, w:
                          int)
 MyPuppy(name:
                 String)
 bark():
          void
+ eat(amt: int) : void
 getName () : String
+ getWeight () :
                 int
+ setName (name:
                 String) : void
 getCount () : int
```

```
MyPuppy
- name : String
- weight : int
- count : int = 0
 RATE: int
+ WT : int = 5
+ MyPuppy()
+ MyPuppy(n : String, w:
                          int)
 MyPuppy(name:
                 String)
 bark():
          void
+ eat(amt: int) : void
 getName () : String
+ getWeight () :
                 int
+ setName (name:
                 String) : void
 getCount () : int
```

## Class Variables

```
MyPuppy
- name : String
- weight : int
- count : int = 0
+ RATE : int
+ WT : int = 5
+ MyPuppy()
+ MyPuppy(n : String, w:
                          int)
 MyPuppy(name:
                 String)
+ bark() : void
+ eat(amt: int) : void
+ getName () : String
+ getWeight () :
                 int
+ setName (name:
                 String) : void
 getCount () : int
```

• A final variable can only be assigned a value once.

- A final variable can only be assigned a value once.
- A blank final is a final variable that has not been initialized during declaration. Its value may be assigned at a later stage.

- A final variable can only be assigned a value once.
- A blank final is a final variable that has not been initialized during declaration. Its value may be assigned at a later stage.
- Some points to remember:

- A final variable can only be assigned a value once.
- A blank final is a final variable that has not been initialized during declaration. Its value may be assigned at a later stage.
- Some points to remember:
  - A blank final instance variable

- A final variable can only be assigned a value once.
- A blank final is a final variable that has not been initialized during declaration. Its value may be assigned at a later stage.
- Some points to remember:
  - A blank final instance variable
    - must be initialize at the constructor;

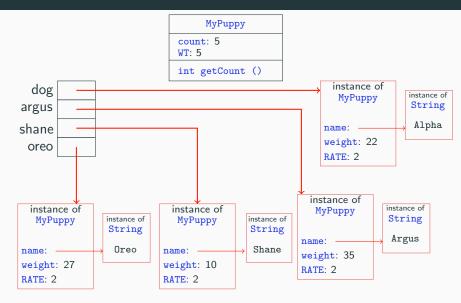
- A final variable can only be assigned a value once.
- A blank final is a final variable that has not been initialized during declaration. Its value may be assigned at a later stage.
- Some points to remember:
  - A blank final instance variable
    - must be initialize at the constructor;
    - cannot be initialize in class methods.

- A final variable can only be assigned a value once.
- A blank final is a final variable that has not been initialized during declaration. Its value may be assigned at a later stage.
- Some points to remember:
  - A blank final instance variable
    - must be initialize at the constructor;
    - cannot be initialize in class methods.
  - A blank final class variable

- A final variable can only be assigned a value once.
- A blank final is a final variable that has not been initialized during declaration. Its value may be assigned at a later stage.
- Some points to remember:
  - A blank final instance variable
    - must be initialize at the constructor;
    - cannot be initialize in class methods.
  - A blank final class variable
    - cannot be left uninitialized.

- A final variable can only be assigned a value once.
- A blank final is a final variable that has not been initialized during declaration. Its value may be assigned at a later stage.
- Some points to remember:
  - A blank final instance variable
    - must be initialize at the constructor;
    - cannot be initialize in class methods.
  - A blank final class variable
    - cannot be left uninitialized.
    - cannot be initialized in constructor or class methods.

# Alpha, Argus, Oreo, and Shane





 Instance methods can access instance variables and instance methods directly.

- Instance methods can access instance variables and instance methods directly.
- Instance methods can access class variables and class methods directly.

- Instance methods can access instance variables and instance methods directly.
- Instance methods can access class variables and class methods directly.
- Class methods can access class variables and class methods directly.

- Instance methods can access instance variables and instance methods directly.
- Instance methods can access class variables and class methods directly.
- Class methods can access class variables and class methods directly.
- Class methods cannot access instance variables or instance methods directly?they must use an object reference.

- Instance methods can access instance variables and instance methods directly.
- Instance methods can access class variables and class methods directly.
- Class methods can access class variables and class methods directly.
- Class methods cannot access instance variables or instance methods directly?they must use an object reference.
- Also, class methods cannot use the this keyword as there is no instance for this to refer to.

- Instance methods can access instance variables and instance methods directly.
- Instance methods can access class variables and class methods directly.
- Class methods can access class variables and class methods directly.
- Class methods cannot access instance variables or instance methods directly?they must use an object reference.
- Also, class methods cannot use the this keyword as there is no instance for this to refer to.

