Object & Class

- **Object**: contains variables (fields, instance variables) and methods
  - **Variables**: "state" or "characteristics"
    - e.g., name, age
  - **Methods**: "behavior" or "action"
    - e.g., yell, bounce
- **Class**: blueprint (definition) of an object
  - No memory space is reserved for object data
- An object is an instance of a class

Object & Class—an analogy

- **Object**: a folder that stores information (data and instructions)
  - **Class**: a drawer in a filing cabinet that holds folders of the same type

What is in an object? (What is in a folder?)

- Fields to store data
- Instructions for dealing with the object

Methods

- **Function**: a value is returned at the end of the method
- **Procedure**: the method performs some operations but no value is returned at the end of the method

Using predefined classes

- All the predefined classes are collectively called the Java API
  - Classes are grouped into packages. E.g., java.io, java.net, javax.swing
  - Use the import statement:
    ```java
    import javax.swing.*;
    ```
  - To find out what the classes do, read the API specifications:
Class `JFrame`

- Deals with windows (frames) on the monitor
- See Fig 1.6 in text to see a short list of methods
- See the API documentation for complete specifications

Creating an object

- The expression `new JFrame()`
  - Creates a `JFrame` object (folder) and gives it a reference name
  - Calls method `JFrame()` to set initial values for the object
  - Yields the reference of the object

Creating an object

- The expression `new JFrame();`

Creating an object

- The expression `new JFrame();`

Reference variable

- Use a reference variable to hold on to an object:

  ```java
  JFrame f = new JFrame();
  ```

  Use the class name as a type

Calling instance methods

  ```java
  JFrame f = new JFrame();
  f.show();
  f.setSize(600,200);
  int w = f.getWidth();
  ```

Calling instance methods

  ```java
  frame f = new JFrame();
  ```

Primitives vs non-primitives values

  ```java
  int x = 2;
  int y = 2;
  JFrame f1 = new JFrame();
  JFrame f2 = new JFrame();
  ```