Class/object example
COMP 102

Victoria University of Wellington

Defining a class of objects

- CartoonCharacter is not part of the Java libraries
  - ⇒ have to define the class

- Need to define:
  - methods:
    - specify the actions the objects can do

  - constructor:
    - specifies how to make a new CartoonCharacter object

  - fields:
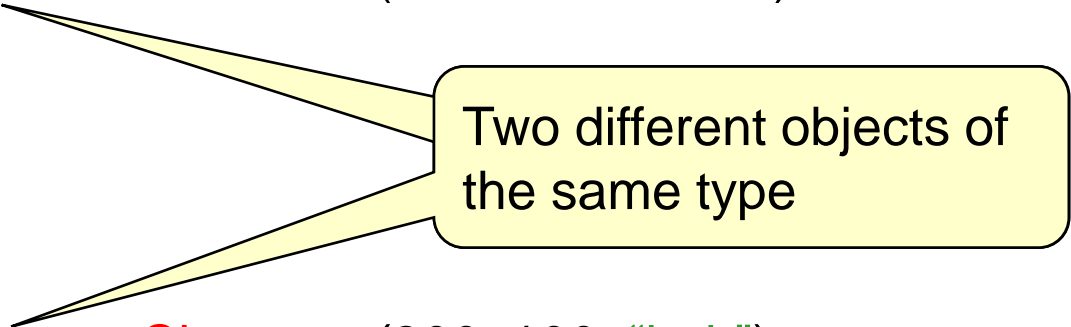   - for storing the information about the state of each object

CartoonStory program

- Java Program with 2D cartoon objects
- Uses CartoonCharacter objects:
  - Methods:
    - public void lookLeft( )
    - public void lookRight( )
    - public void smile( )
    - public void frown( )
    - public void walk(double distance)
    - public void speak(String msg)
    - public void think(String msg)

  - Information a CartoonCharacter object must store:
    - its images
    - its size
    - its state (position, direction, emotion)

CartoonStory Program

```
public class CartoonStory{

    public void playStory( ){

        CartoonCharacter ca = new CartoonCharacter(150, 100, "alice");

        ca.lookRight();
        ca.lookLeft();
        ca.frown( );
        ca.speak("Is anyone here?");

        CartoonCharacter cb = new CartoonCharacter(300, 100, "bob");

        cb.smile( );    cb.lookLeft( );

        cb.speak("Hello");

        ca.lookRight( );      ca.smile( );

        ca.speak("Hi there, I'm Jim");

        cb.speak("I'm Jan");
    }
}
```

Two different objects of the same type

CartoonCharacter: methods

```java
public class CartoonCharacter {

    public void lookLeft( ) {              public void lookRight( ) {
        // erase figure                        // erase figure
        // change direction                    // change direction
        // redraw figure                       // redraw figure
    }                                      }
    public void frown( ) {                 public void smile( ) {
        // erase figure                        // erase figure
        // change emotion                      // change emotion
        // redraw figure                       // redraw figure
    }                                      }
    public void walk(double dist) {        public void speak(String msg) {
        // erase figure                        // draw msg in speak bubble
        // change position                     // wait
        // redraw figure                       // erase msg
    }                                      }
```

//Omitted think for space, same as speak, but using a think bubble

CartoonCharacter: wishful methods

```java
public class CartoonCharacter {

    public void lookLeft( ) {
        this.erase( );
        // change direction
        this.draw( );
    }
    public void frown( ) {
        this.erase( );
        // change emotion
        this.draw( );
    }
    public void walk(double dist) {
        this.erase( );
        // change position
        this.draw( );
    }

    public void erase( ) {
        ???

    public void lookRight( ) {
        this.erase( );
        // change direction
        this.draw( );
    }
    public void smile( ) {
        this.erase( );
        // change emotion
        this.draw( );
    }
    public void speak(String msg) {
        // draw msg in bubble
        // wait
        // erase msg
    }

    public void draw( ) {
        ???
```

CartoonCharacter: draw

```
public void draw( ) {
    // work out which image to use  (eg, "alice-right-smile.png")
    // draw the image on the graphics pane
    // wait a bit
}


public void draw( ) {
    String filename = imagePrefix+"-"+direction+"-"+emotion+".png" ;
    UI.drawImage(filename, figX, figY, wd, ht);
    UI.sleep(500);   // wait 500 mS
}
```

- But where are those variables defined?
- Where do they get their values?