
Classes and Objects

CSE 142, Summer 2003
Computer Programming 1

<http://www.cs.washington.edu/education/courses/142/03su/>

Outline for Today

- Short review of objects
- Discussion of classes and objects
- Major concepts
 - » Objects are *instances* of classes
 - » Classes are templates or blueprints for objects
 - » Objects properties can be simple values or other objects

Object Review

- Objects have properties and responsibilities
- We can send messages to objects
 - » Commands - Instruct an object to do something
 - May cause a change in state
 - » Query - Find out value associated with property
- Acrobat Example
 - » clap and twirl are commands
 - the object does something for the caller
 - » count is a query
 - the object returns some information to the caller

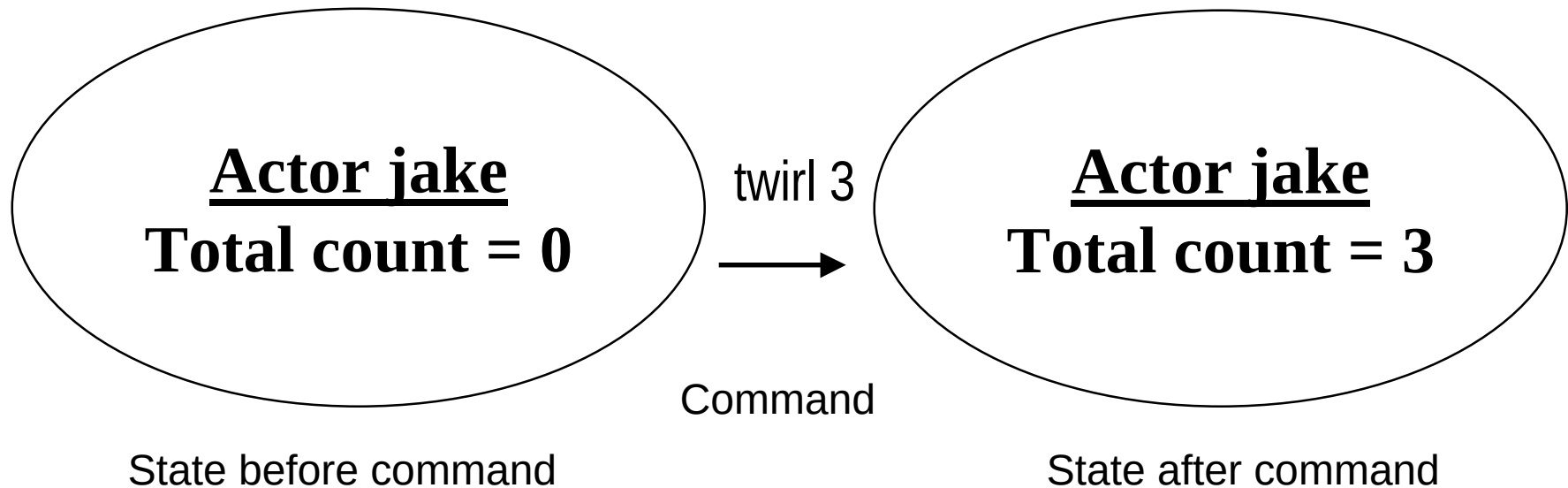
Acrobat sean = new pos()
Acrobat laura
Acrobat andrew
Actor jake

AcrobatWithBuddy linh
AcrobatWithBuddy dang
Choreographer dan
Curmudgeon shirley

sean , clap (2);
jake + twirl (3);
dan twirl 4
dang clap 5
jake count

from Wednesday

State of an object



What is the state after another query "count"?

What is the state after another command "twirl 2"?

Classes

- *Classes* serve as templates/patterns for creating objects
- Every object is an *instance* of a class
- Objects of a particular class have the same list of responsibilities and property types
 - » Each object is distinct
 - » Each object probably has unique values for some or all of the properties

Individuals are instances of class “Acrobat”

an **Acrobat** can clap, twirl, and count

class

objects



sean



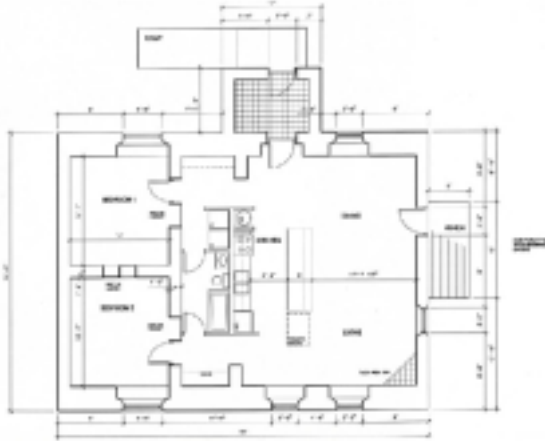
laura



andrew

Houses are instances of blueprints

PROJECT PLANS: Floor Plan

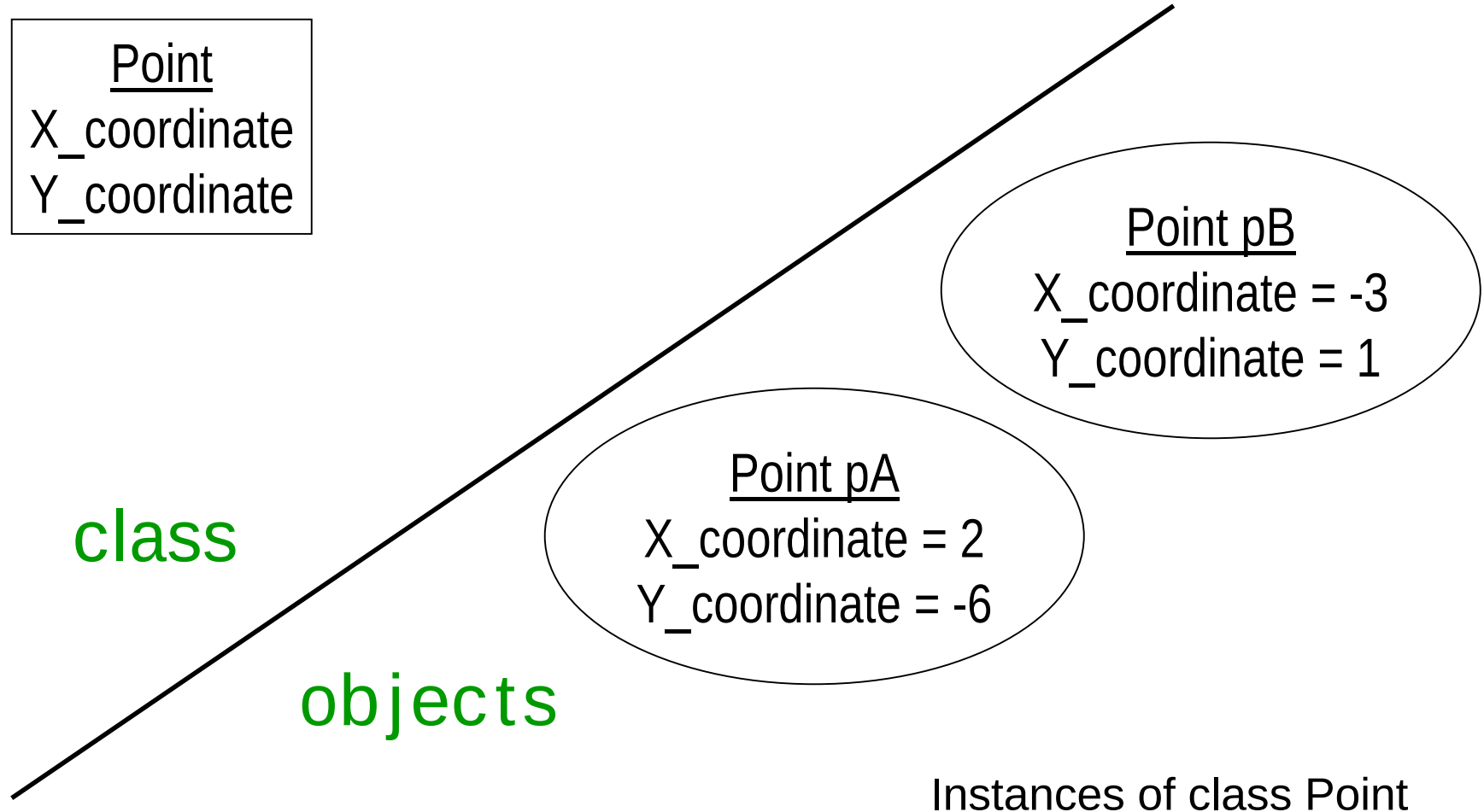


class

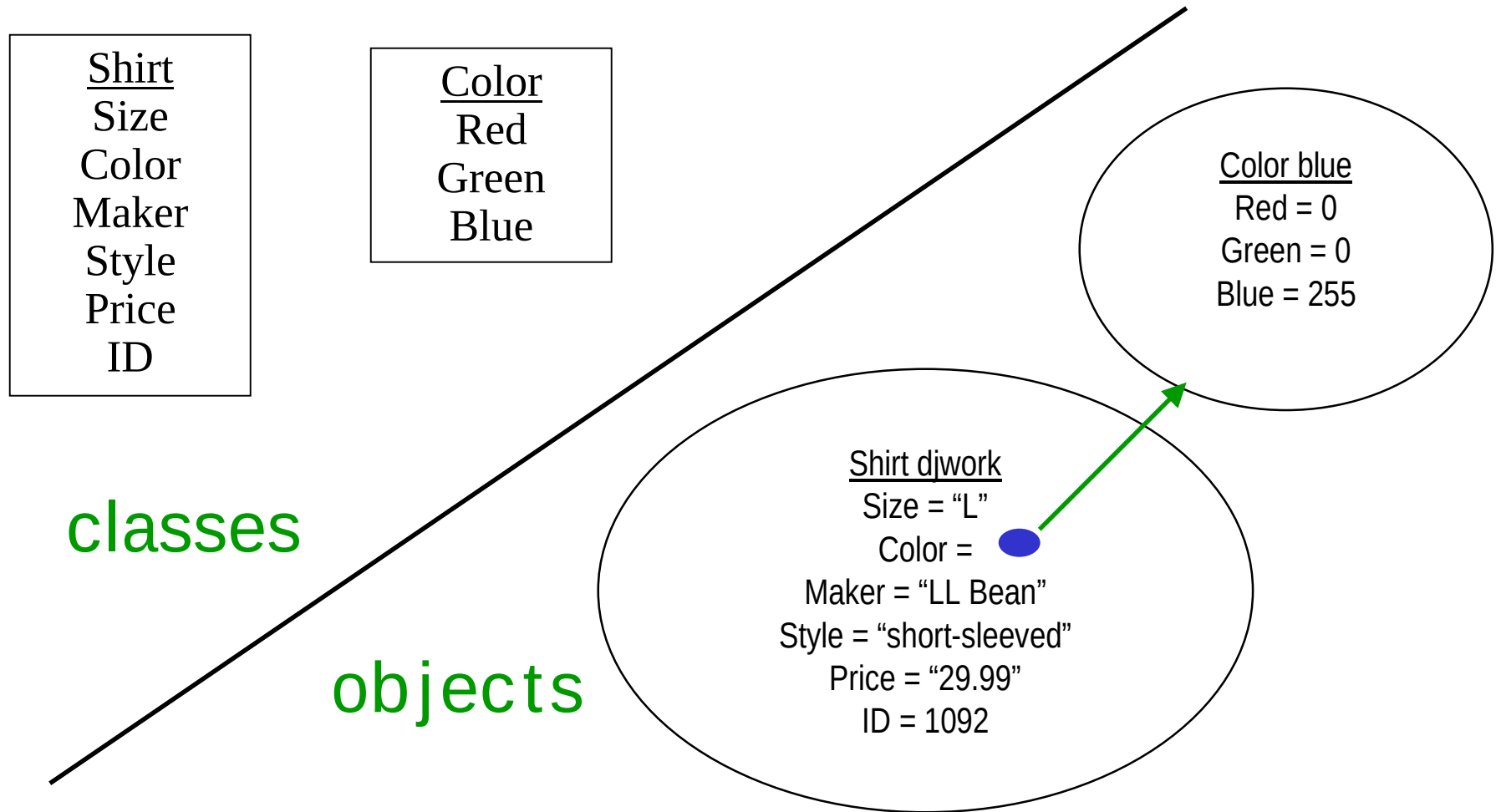
objects



Specific points are instances of class Point



Properties can be references to objects



Type Review

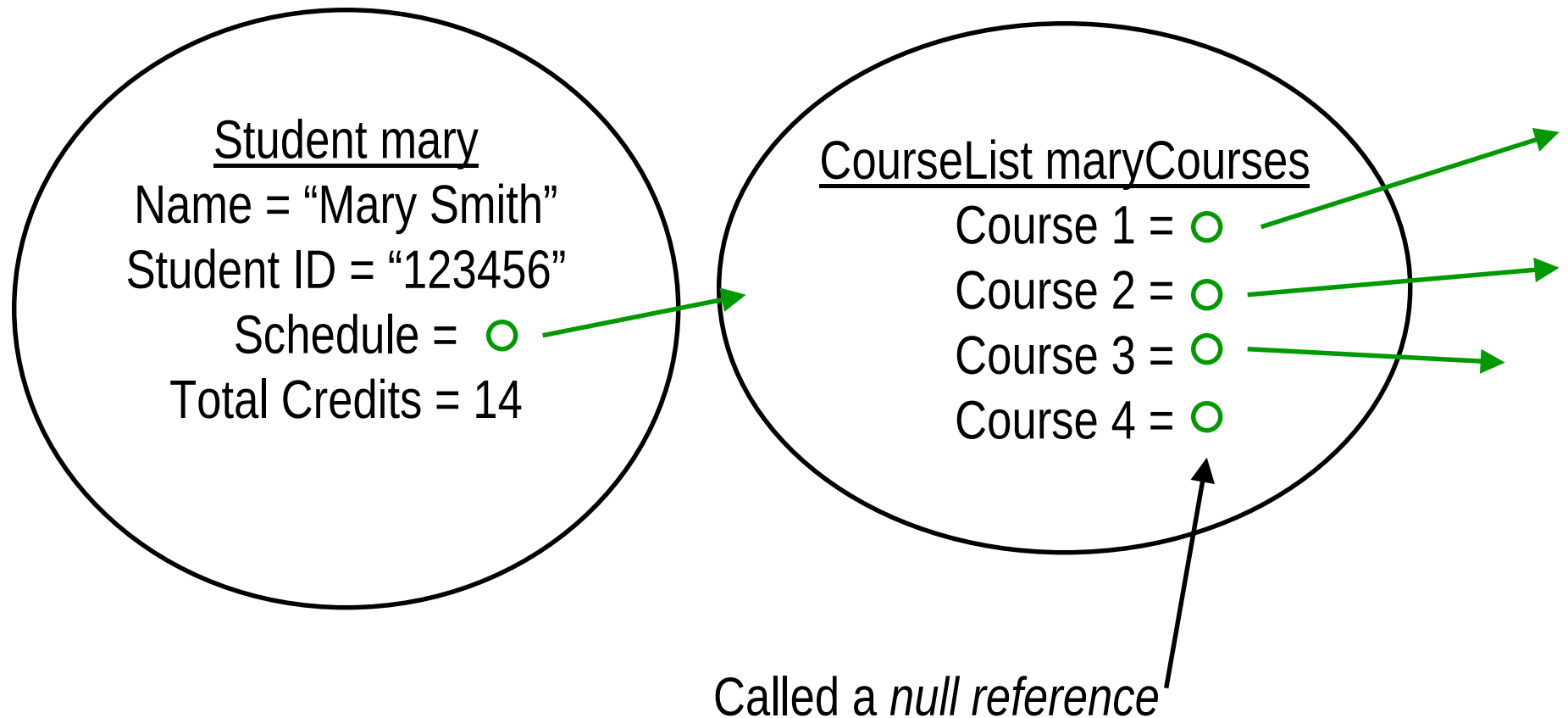
- What is a type?

<u>Shirt Property</u>	<u>Value</u>	<u>Type</u>
Size	“L”	
Color	Reference value	
Maker	“LL Bean”	
Style	“short-sleeved”	
Price	29.99	
ID	1092	

Student Class

- Properties
 - » Student ID
 - » Name
 - » Address
 - » Phone Number
 - » Course List
 - » GPA
 - » Transcript
 - » Total credits
 - » Full-time?
- Responsibilities
 - » Add course
 - » Drop course
 - » Update address
 - » Get GPA
 - » Get transcript
 - » Get schedule
 - » Get student ID
 - » Get total credits
 - » Get full-time status

Student Object Example



Object oriented terminology

- *Classes* serve as templates for creating objects
 - » Objects of a particular class share the same list of responsibilities and property types
- *Objects* are instances of classes
 - » Objects of a particular class can have different values for their properties
- Object properties can be simple values or references to other objects

Classes and Objects in Java

- Preview of what's to come:
 - » Objects have properties
 - In Java, we'll call these *instance variables*
 - » Objects have responsibilities
 - In Java, we'll call these *methods*
 - » Next week: we'll start Java
 - Now you have a solid foundation of concepts we'll use throughout the quarter