

Lecture 25: classes

A class allows us to create our own object types.

e.g. NOT just use what Zelle, turtle have to offer — opens up tons of possibilities!

Let's say we wanted to make a type of object for a Colby Student — Student

Having Student class allows us to make objects of that type:

Our class like calling
`rect = gr. Circle(gr. point(0,0), 10)`

`jane = Student('Jane')`

`bob = Student('Bob')` name = 'bob'

`joe = Student('joe')` name = 'joe'

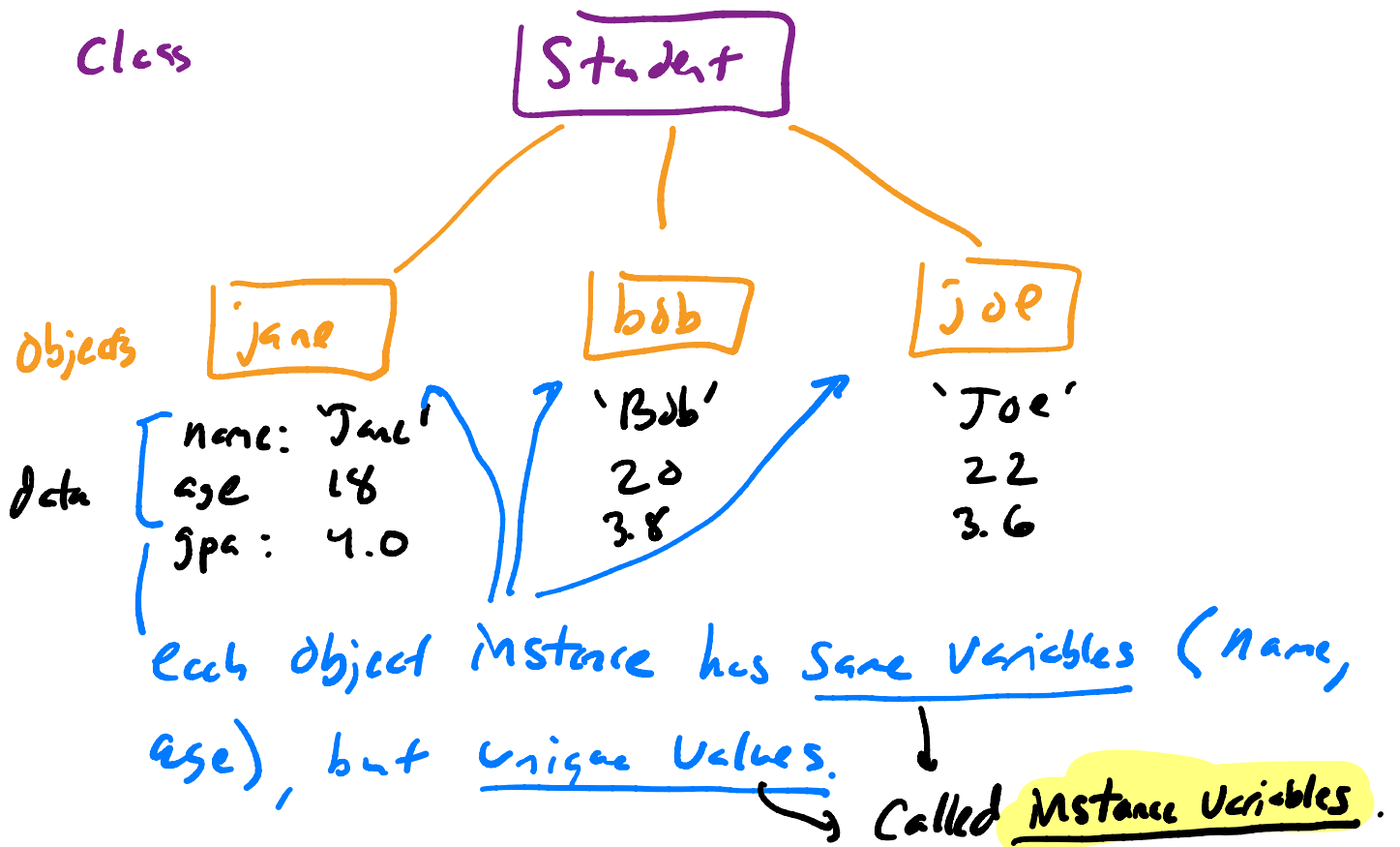
each object has unique data

• What is a good thing to create objects of?

nouns : things — e.g. Student is a thing
rectangle is a thing
turtle is a thing

Why make a class for a thing?

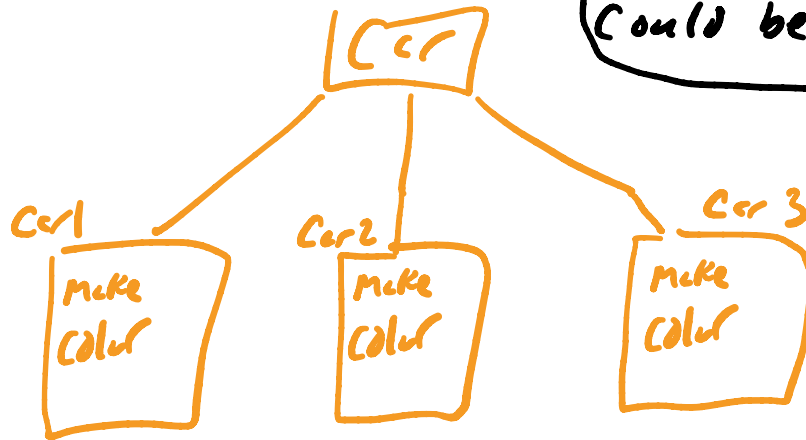
1) Groups data / information related to unique instances of that thing



- An instance variable could be basic data type or an object
 ⇒ will be defined for any object you make of a class

e.g. a Car class would probably have instance variables for: Make and Color

all cars have these properties but of course specific values across cars could be different



- all cars have a make and color
- These 3 cars may have different specific colors and makes

Example: Circle Class

instance vars

Circ1	
x	0
y	0
radius	10

instance vars

Circ2

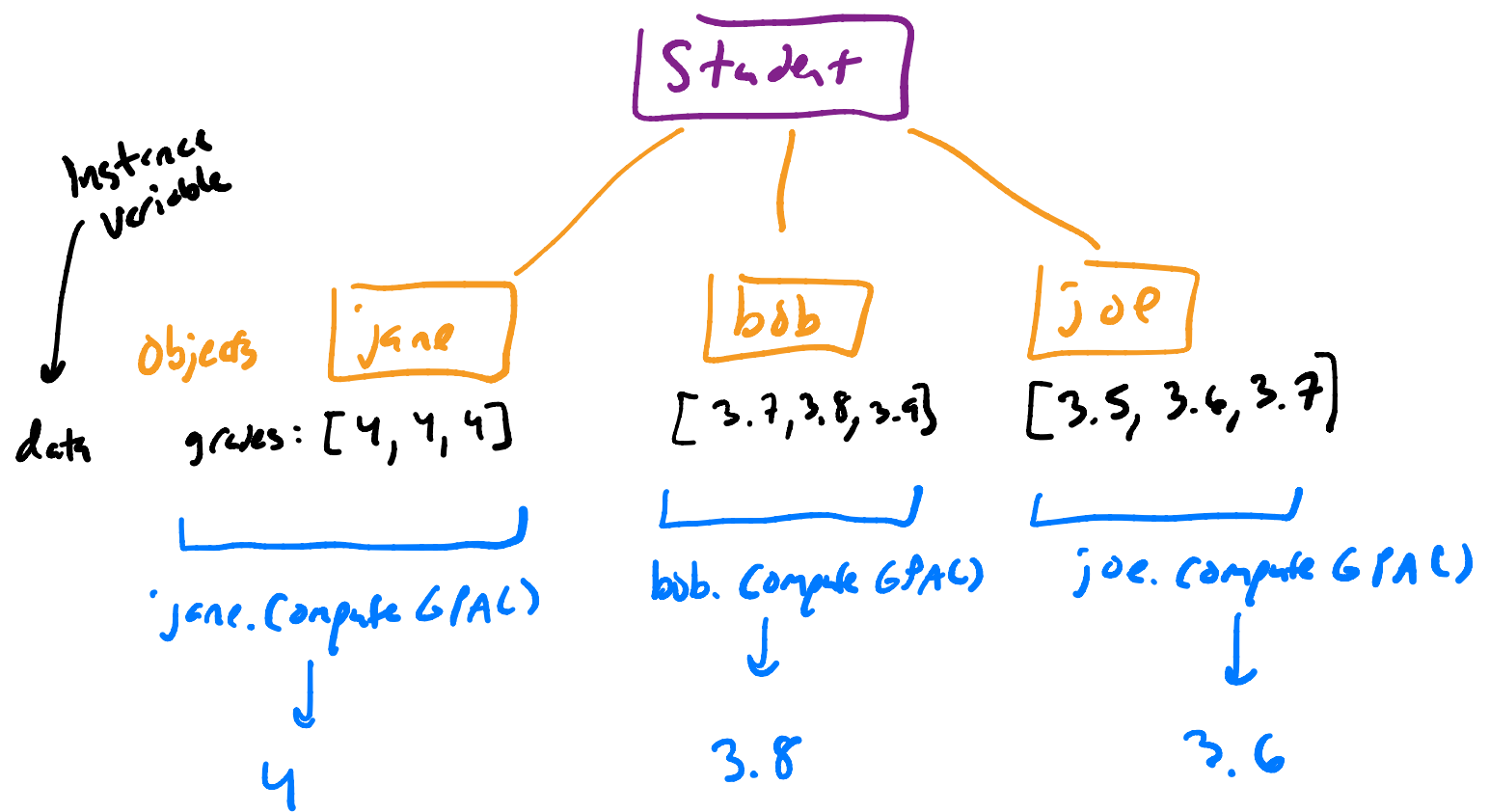
x	11
y	12
radius	9

Circ1 = Circle(Point(0,0), 10)
 Circ2 = Circle(Point(11,12), 9)

define what data any circle should have.

2) Classes allow us to perform actions on each instance, with its own data: **methods**

- we could add a method to our Student class to compute each student's gpa — `compute GPA()`



Common types of methods:

- Access data from each instance of a class (object)
— **get method** — method has "get" in it.

e.g. `get GPA()`, `get Name()`, `get Age()`

ask a student what his/her gpa is — `jane.get GPA()`

- Change data from an instance — **set method**
— method has "set" in it.

e.g. set Age(), set GPA(), set Name()

It's Bob's birthday, we call bob.set Age(21)
to update age 20 → 21.

- Make new instances (objects) of a class by calling
special method called **constructor**
calling constructor method for class student

jane = Student('Jane')

bob = Student('Bob')

joe = Student('joe')

- Let's write a simple class for a Student
and play around with it.
- Let's analyze the memory model for a program
involving Student class