CSCI 334:
Principles of Programming Languages

Lecture 22: Inheritance in OO

Instructor: Dan Barowy

Williams

Topics

Inheritance

How to give a good talk

SCS

Your to-dos

1. **Mostly working** project, **due Sunday 12/10**
2. Want to talk about your project?
   Office hours today 4-5pm. More Friday.

Final project timeline

1. ~~Project proposal (Lab 8), **due Sun 11/12**~~
2. ~~Minimally working version (Lab 9), **due Sun 11/19**~~
3. ~~Language specification doc (Lab 10), **due Sun 12/3**~~
4. Mostly working version (Lab 11), **due Sun 12/10**
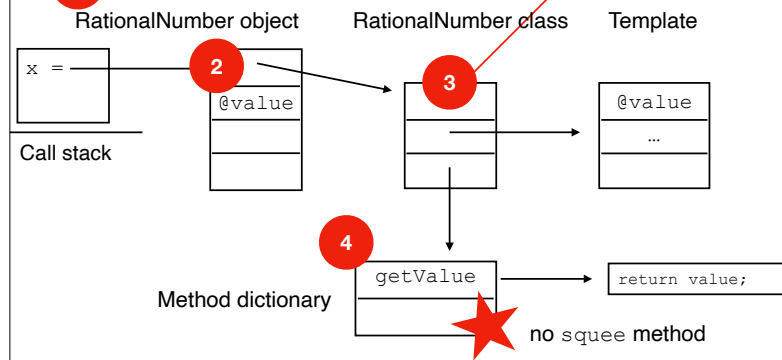5. Project + video presentation (Lab 12), **due Sun 12/17**

Announcements

CS Holiday Party

Friday, Dec 8 @ 2:35pm
CS Common Room

Join the CS faculty and your peers for an end-of-semester celebration. We will have hot cocoa and treats for you to enjoy. Last gathering of the year!

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1 Call `x.squee`

2 `squee` message dispatched to `x`

3 `squee` message forwarded to `RationalNumber`

4 `squee` message lookup in method dictionary

5 algorithm recurses on superclass

Superclass **5**

RationalNumber object   RationalNumber class   Template

x =   **2**   **3**

@value   @value
...

Call stack

4

getValue   return value;

Method dictionary

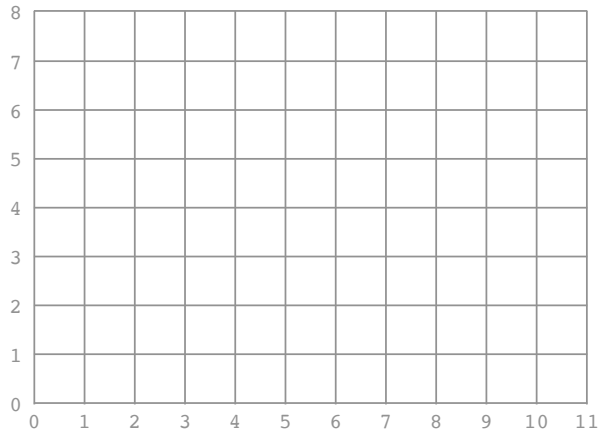no `squee` method

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Ingalls Test for Extensibility

i.e., the "rectangle test"

- The test is about the ability to extend software *after* it has already been designed and written.
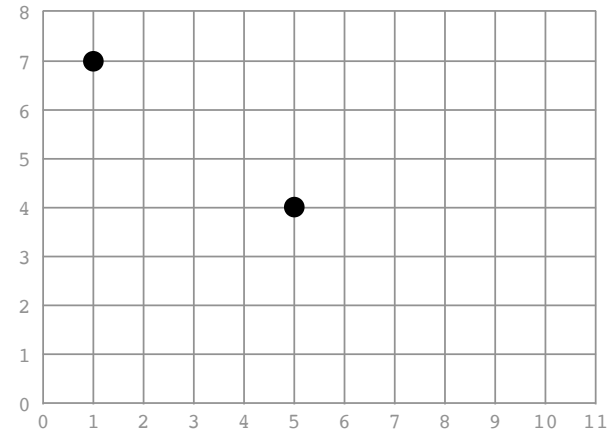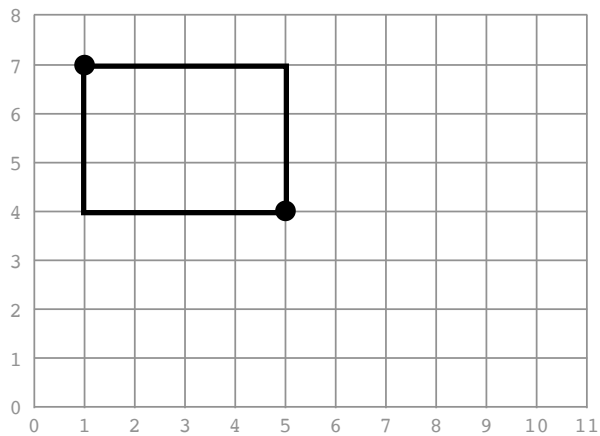
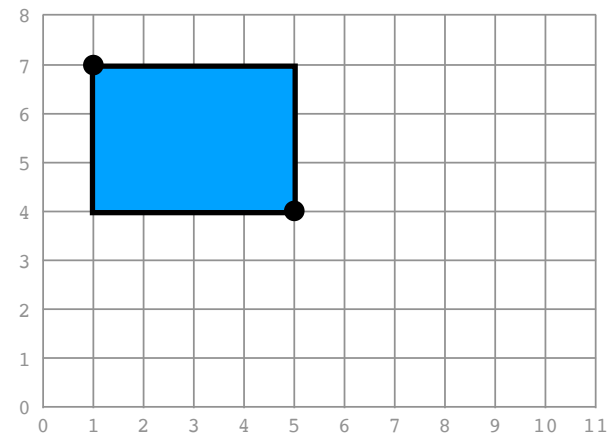---

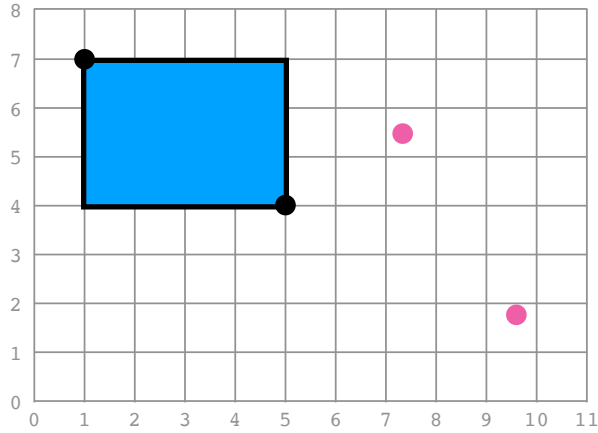OO is designed for extensibility.

Ingalls Test for Extensibility

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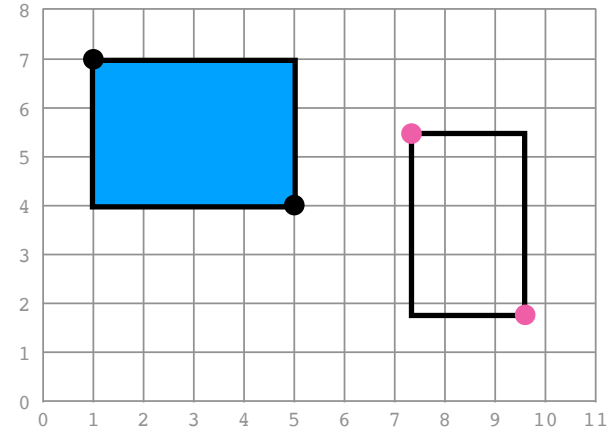
Ingalls Test for Extensibility
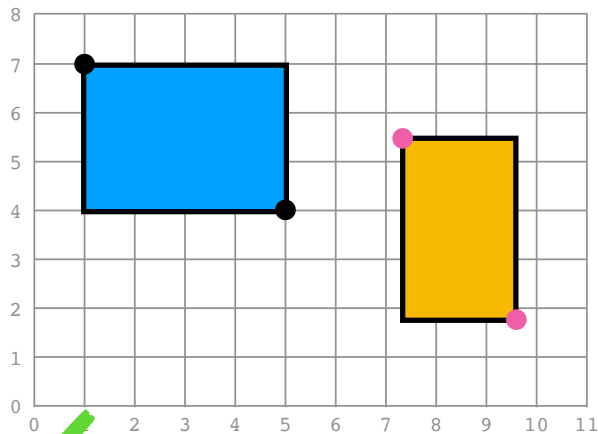
Ingalls Test for Extensibility

Ingalls Test for Extensibility

Ingalls Test for Extensibility

Ingalls Test for Extensibility

✓ yes, it's object-oriented!

Let's try it!
(code)

OO vs Functional Tradeoff

- OO offers a different kind of extensibility than functional (or function-oriented) languages.
- Suppose you're modeling a hospital.

Operation	Doctor	Nurse	Orderly
Print	Print Doctor	Print Nurse	Print Orderly
Pay	Pay Doctor	Pay Nurse	Pay Orderly

- FP makes it easy to add operations (rows).
- OOP makes it easy to add data (columns).

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Lecture 22-2:
How to give a **good** talk

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Video presentation

The Heilmeier Catechism

DARPA operates on the principle that generating big rewards requires taking big risks. But how does the Agency determine what risks are worth taking?

George H. Heilmeier, a former DARPA director (1975-1977), crafted a set of questions known as the "Heilmeier Catechism" to help Agency officials think through and evaluate proposed research programs.

- What are you trying to do? Articulate your objectives using absolutely no jargon.
- How is it done today, and what are the limits of current practice?
- What is new in your approach and why do you think it will be successful?
- Who cares? If you are successful, what difference will it make?

https://www.darpa.mil/work-with-us/heilmeier-catechism

How to give a good talk

Five tips

One: Have a story

Two: Don't "bury the lede"

THE EXCITING PARTS

"We forgot to tell everyone."

2023-2023

Three: Don't make your audience read

Four: Show by example

Five: Stay on script

Six (oops!): Finish on time

Recap & Next Class

This lecture:

Why PL matters

How to give a good talk

Next lecture:

Why PL matters

Evaluation Forms

(all of these are anonymous)

We **listen carefully** to what you say in these forms. Please take your time and write thoughtful responses.

Your feedback is **very valuable** to us!

Purpose of SCS Forms

"[T]he SCS provides instructors with feedback regarding their courses and teaching. The faculty legislation governing the SCS provides that SCS results are made available to the appropriate department chair, the Dean of the Faculty, and at appropriate times, to members of the Committee on Appointments and Promotions (CAP). The results are considered in matters of faculty reappointment, tenure, and promotion."

—Office of the Provost, Williams College

Purpose of "Blue Sheets"

Student comments on the blue sheets […] are solely for [instructor] benefit. They are not made available to department or program chairs, the Dean of the Faculty, or the CAP for evaluation purposes.

—Office of the Provost, Williams College

Blue sheet prompts:

* What **course topic** did you **enjoy the most**?

* What **course topic** did you **least enjoy**? Do you think that it was valuable to learn anyway?

* Are there **other aspects** of the course that you **liked** or **disliked**? (E.g., *office hours*, *TAs*, *assignments*, *course structure*, *meeting times*, etc.) Feel free to suggest alternative approaches!

 * Did you **look forward to coming to class**?