Student-Computer Interaction Design

for Introductory Computer Science

John DeNero

How A Computer Science Course Begins

Photos by Brian Ly, Daily Cal Staff

How A Computer Science Course Begins

Photos by Brian Ly, Daily Cal Staff

How Students Actually Learn to Program

Photo by Alice Oh, Daily Cal Staff

Student–Computer Interaction Design

Projects & Assignments	Lab & Discussion	Lecture & Reading	Question & Answer

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Design from the Student's Perspective

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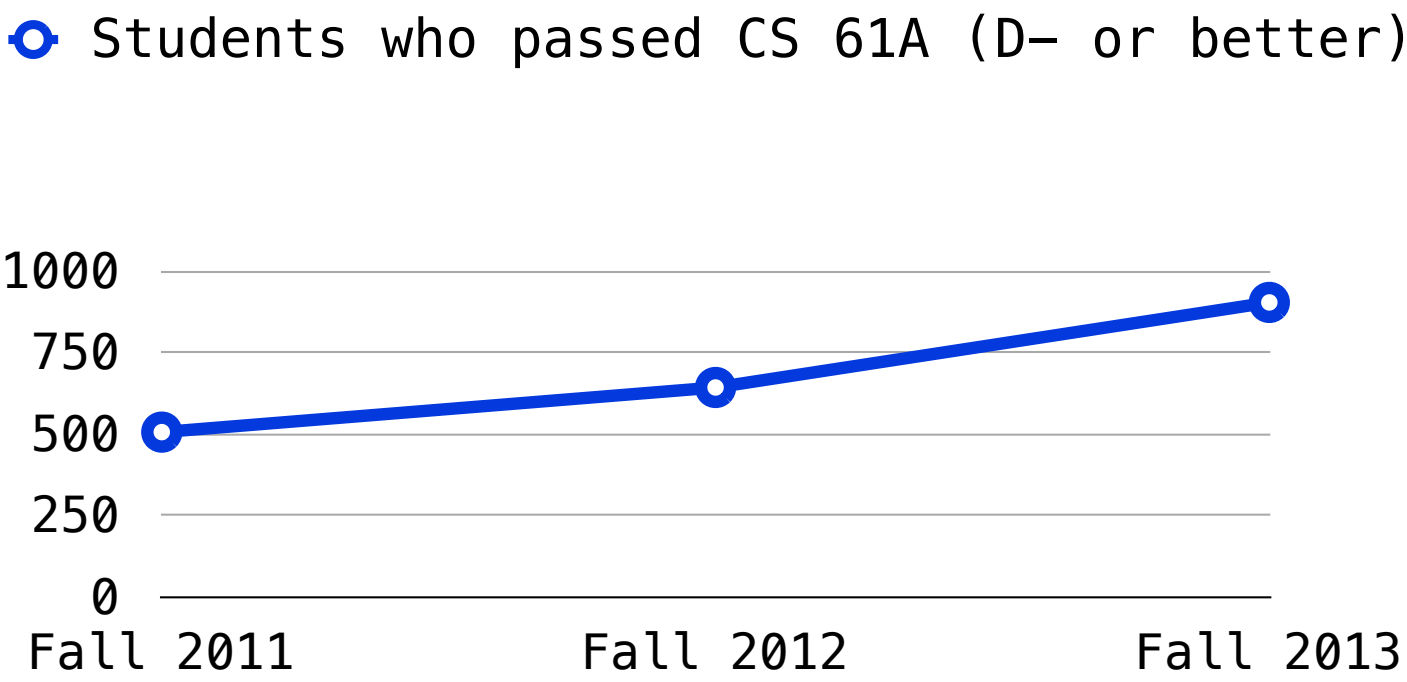

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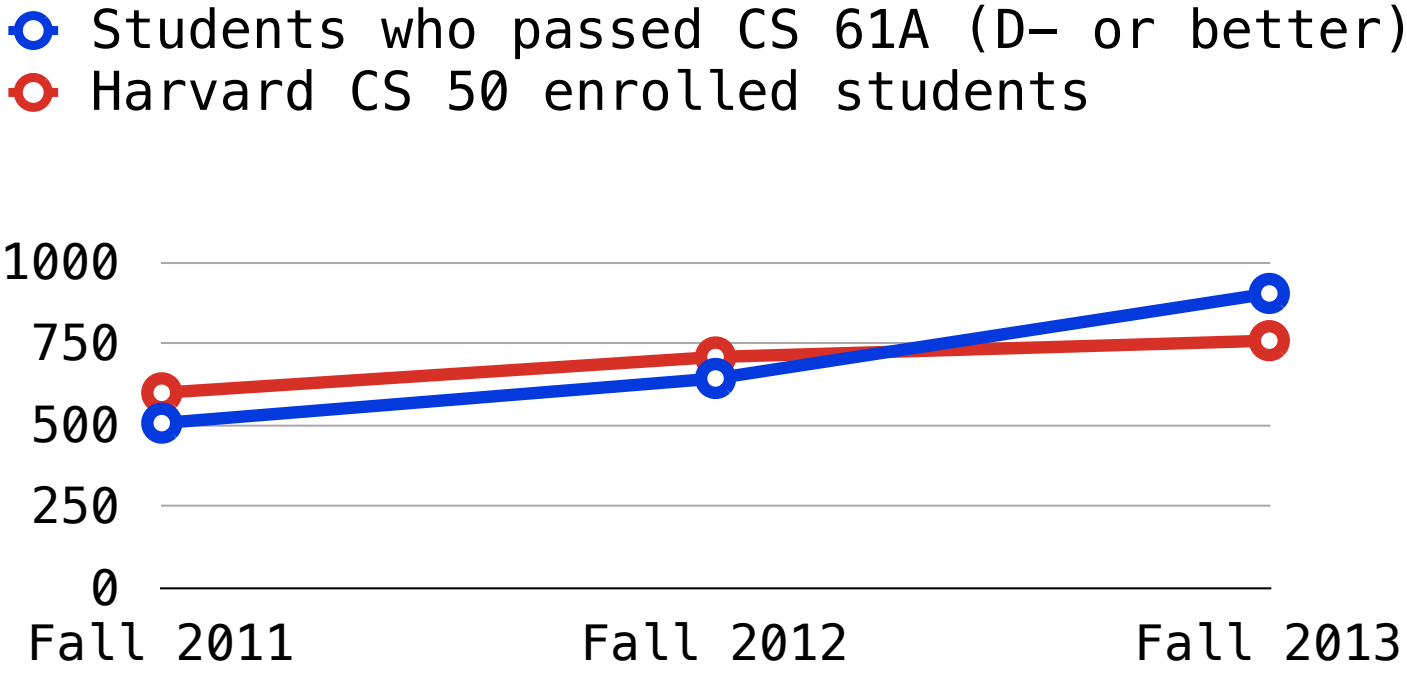

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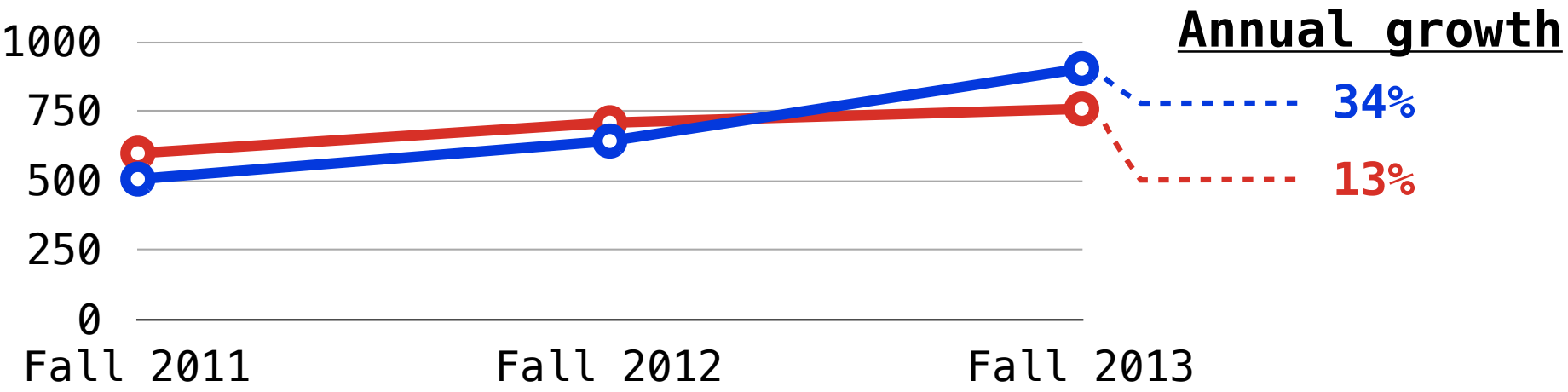

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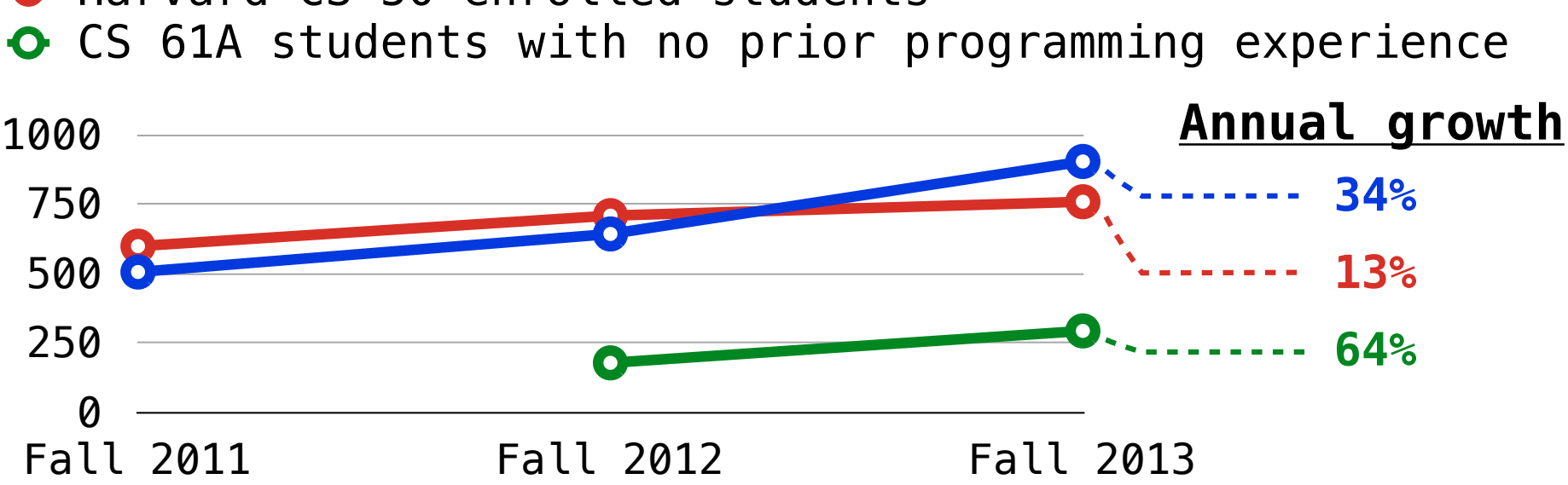

Programming Projects

Scaffolded Programming Projects

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Fill-in-the-blank starter code and a full test suite

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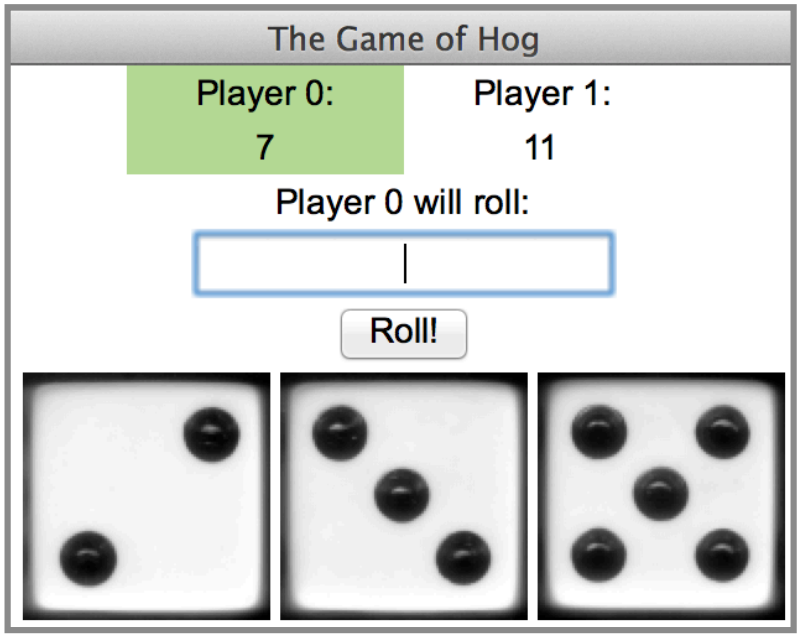

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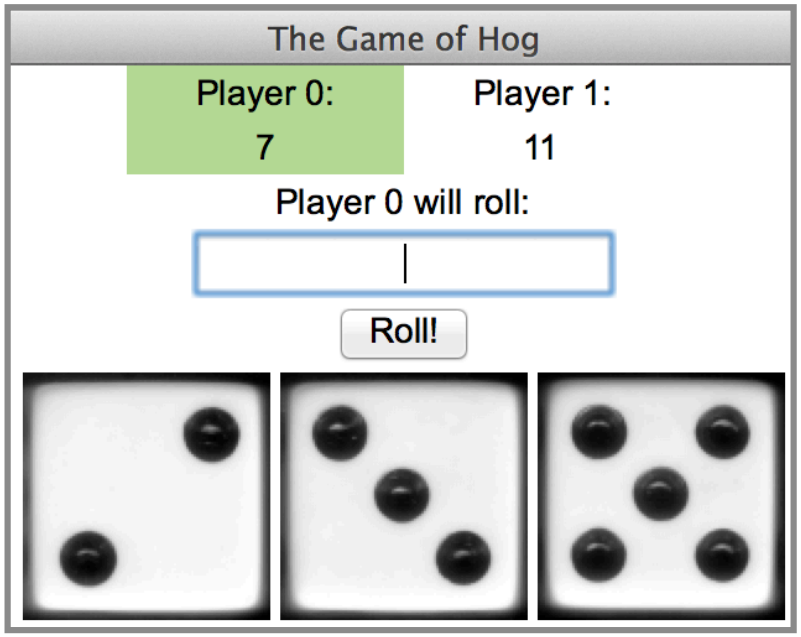

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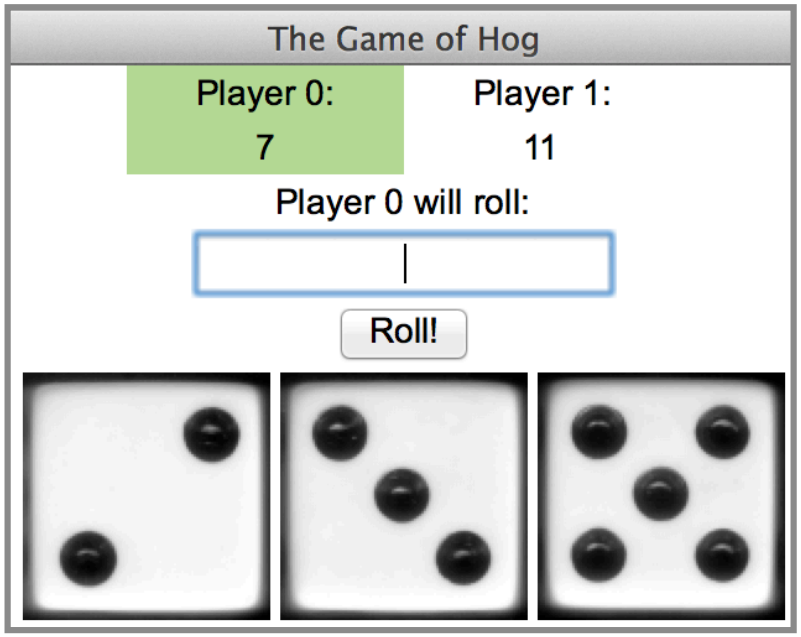

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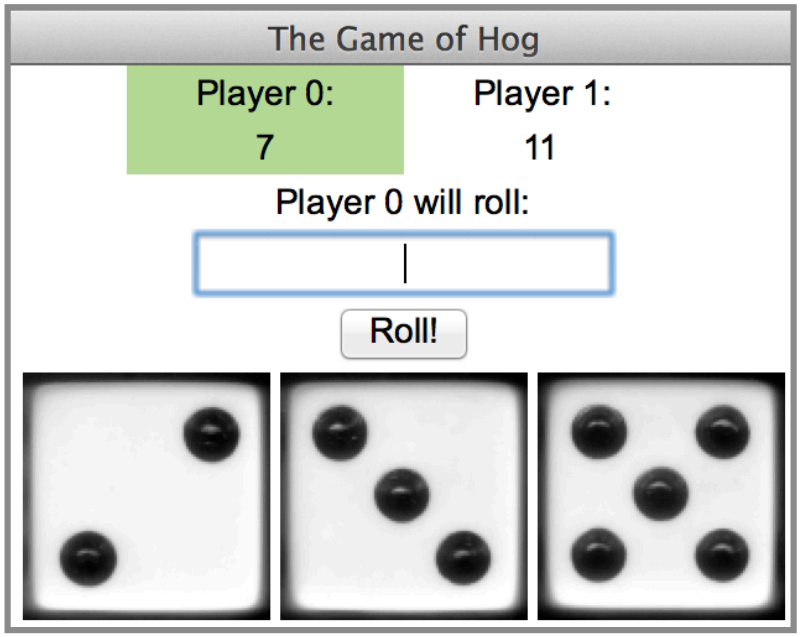


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    """Return a function that returns the average
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    >>> dice = make_test_dice(3, 1, 5, 6)
    >>> averaged_dice = make_averaged(dice, 1000)
    >>> averaged_dice()
    3.75
    """
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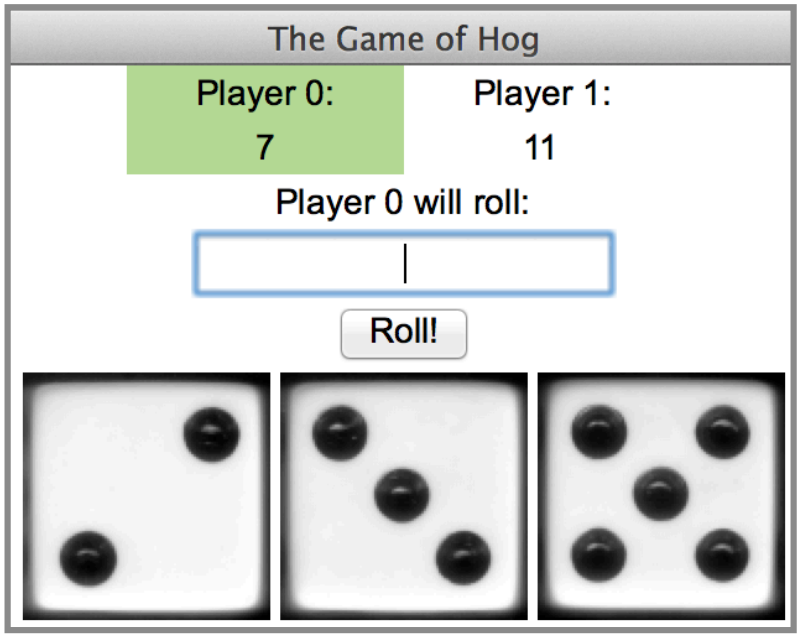


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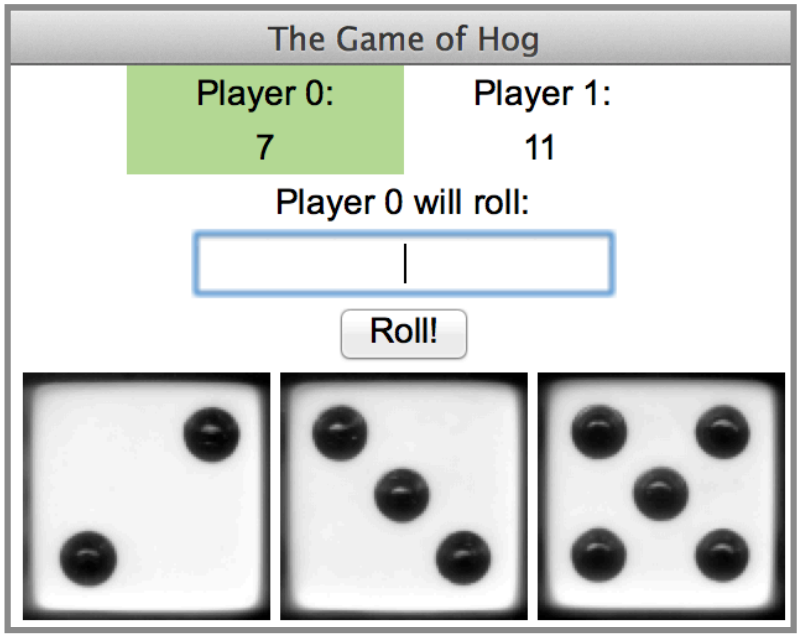


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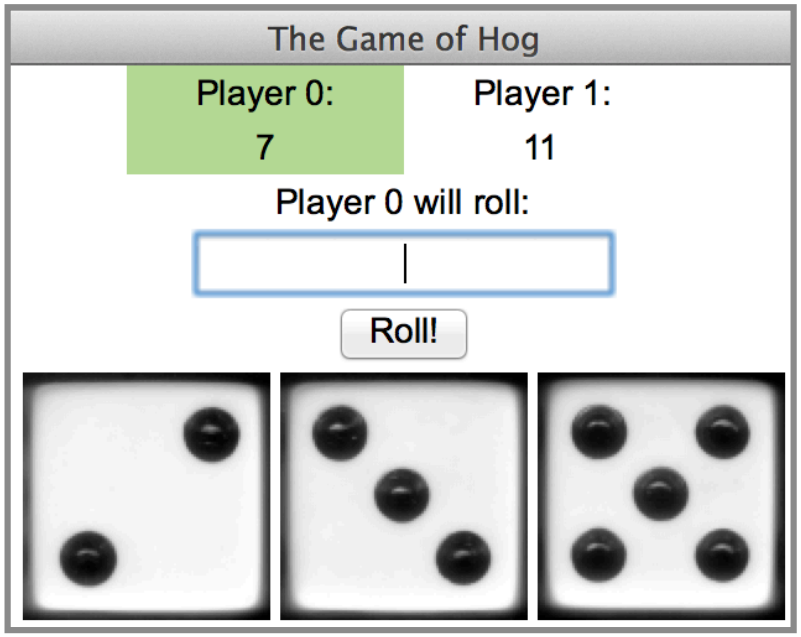


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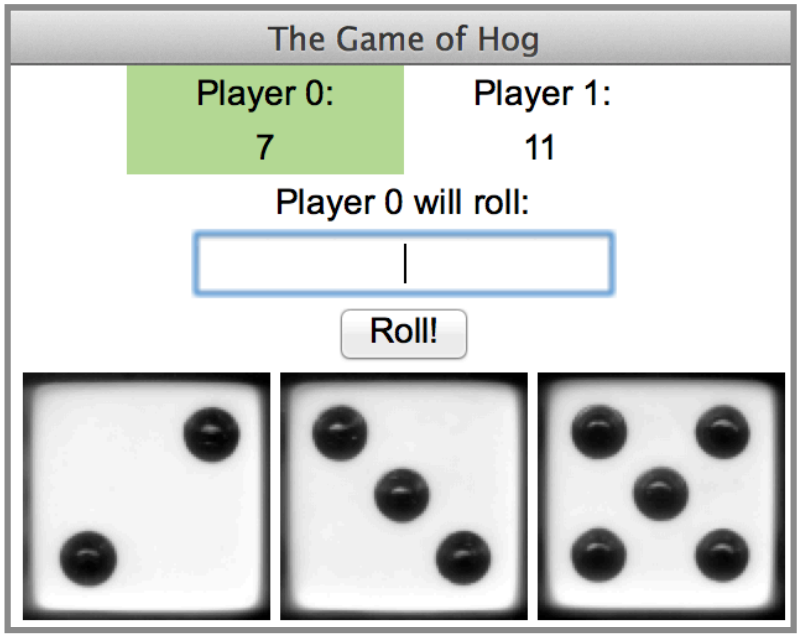


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Teaching Introductory Artificial Intelligence with Pac-Man, EAAI 2010

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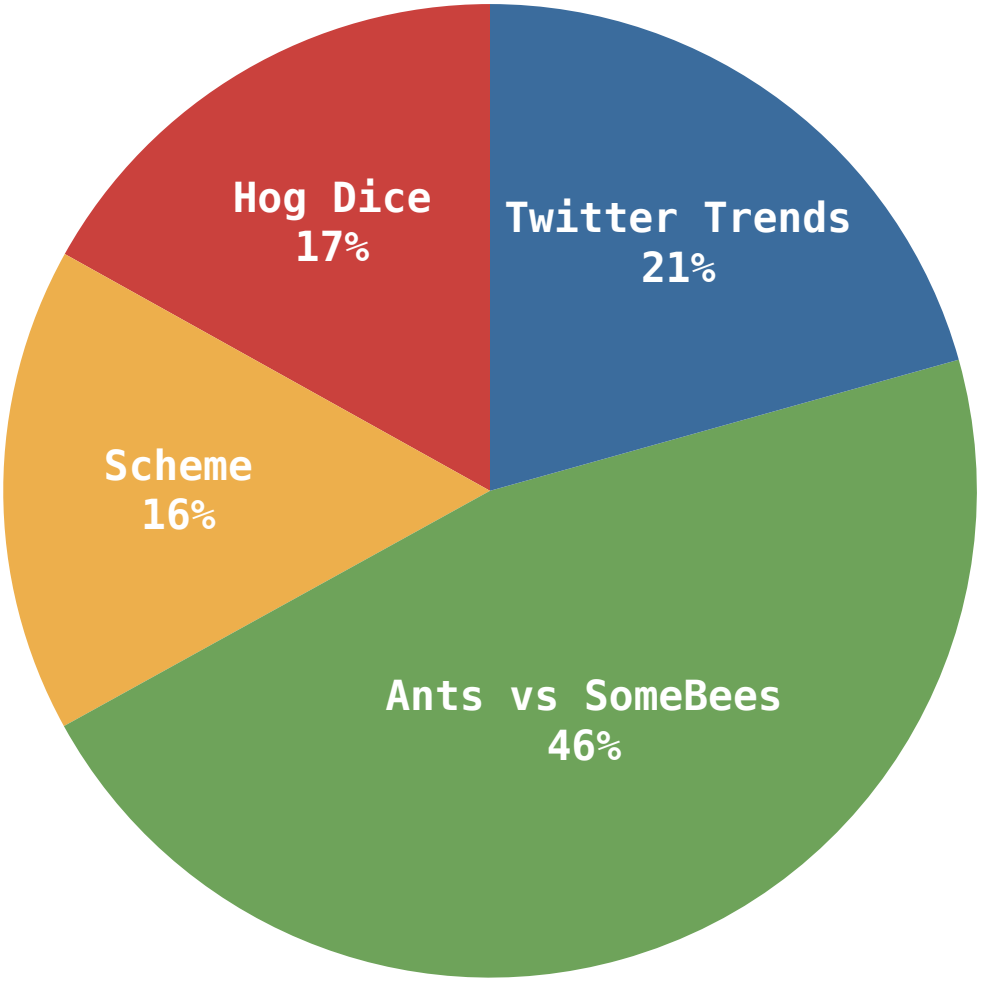

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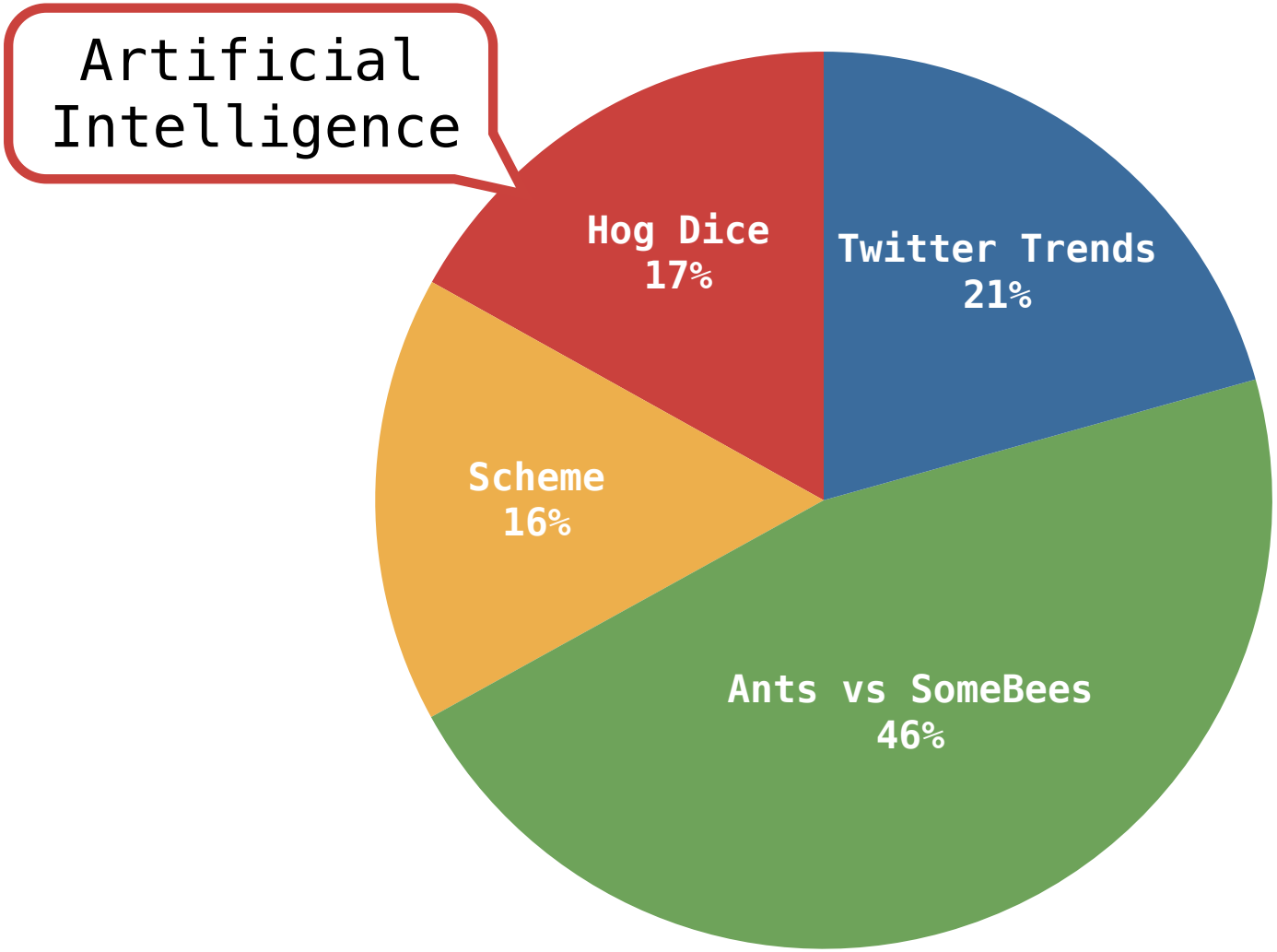

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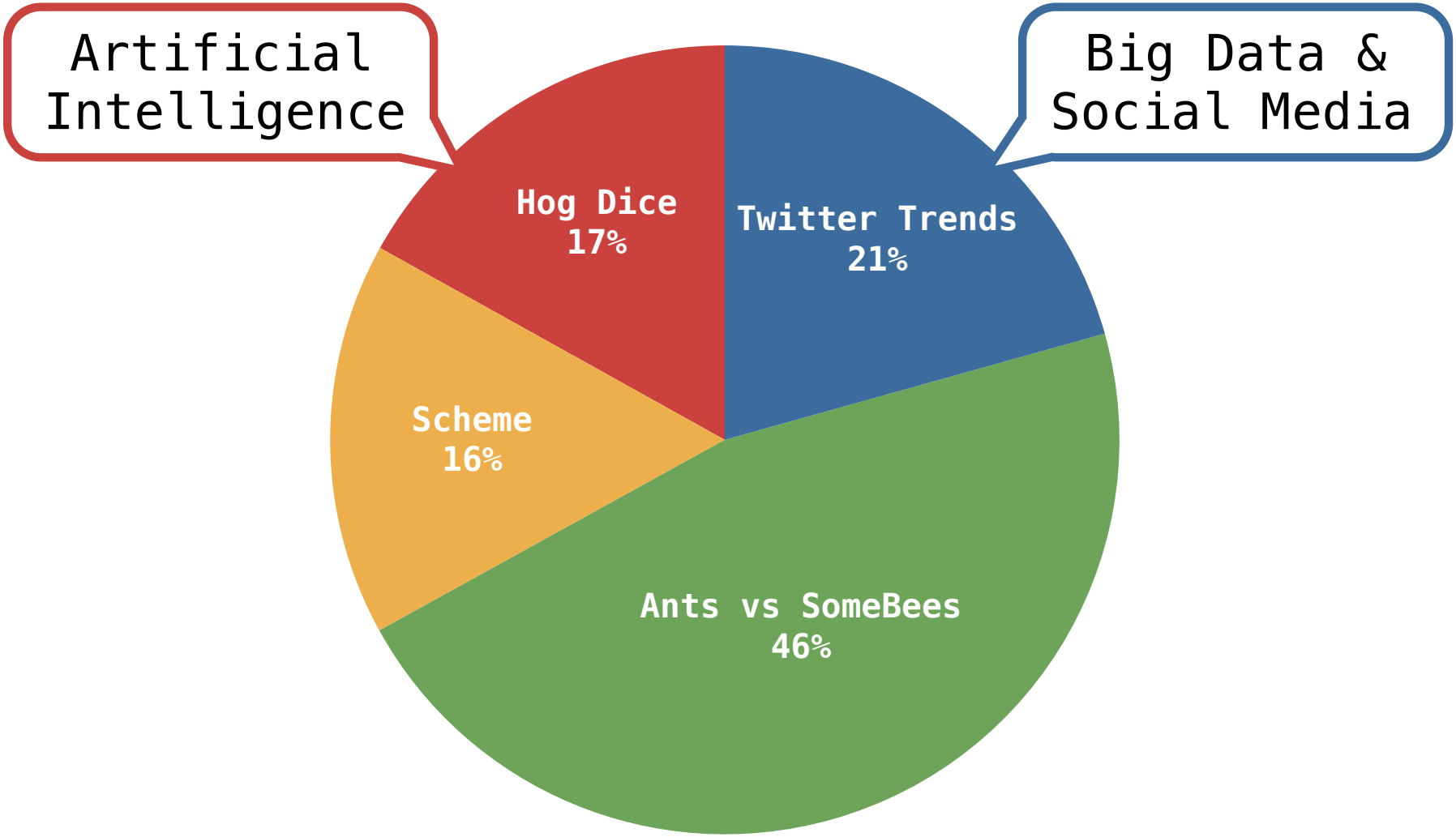

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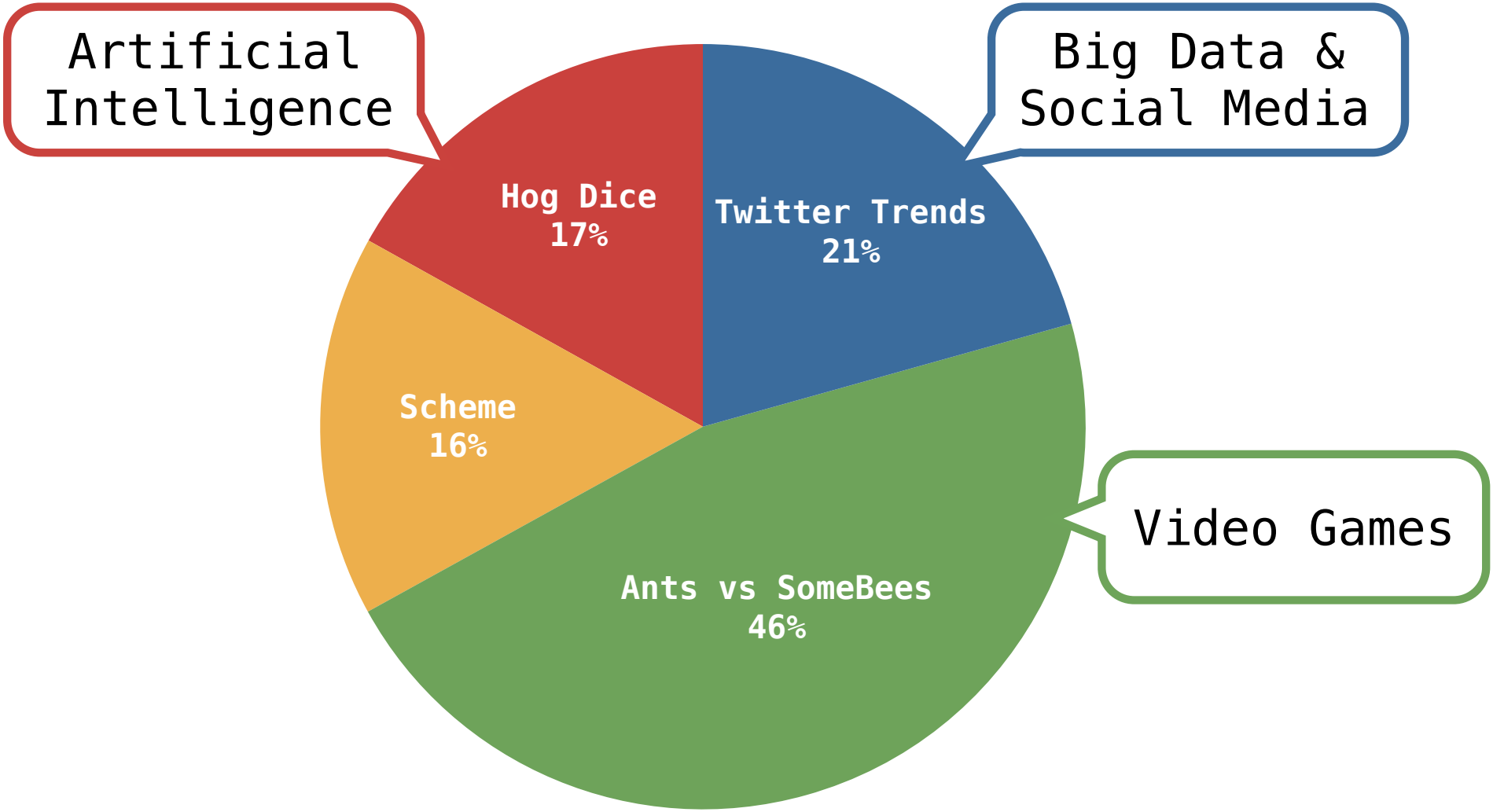

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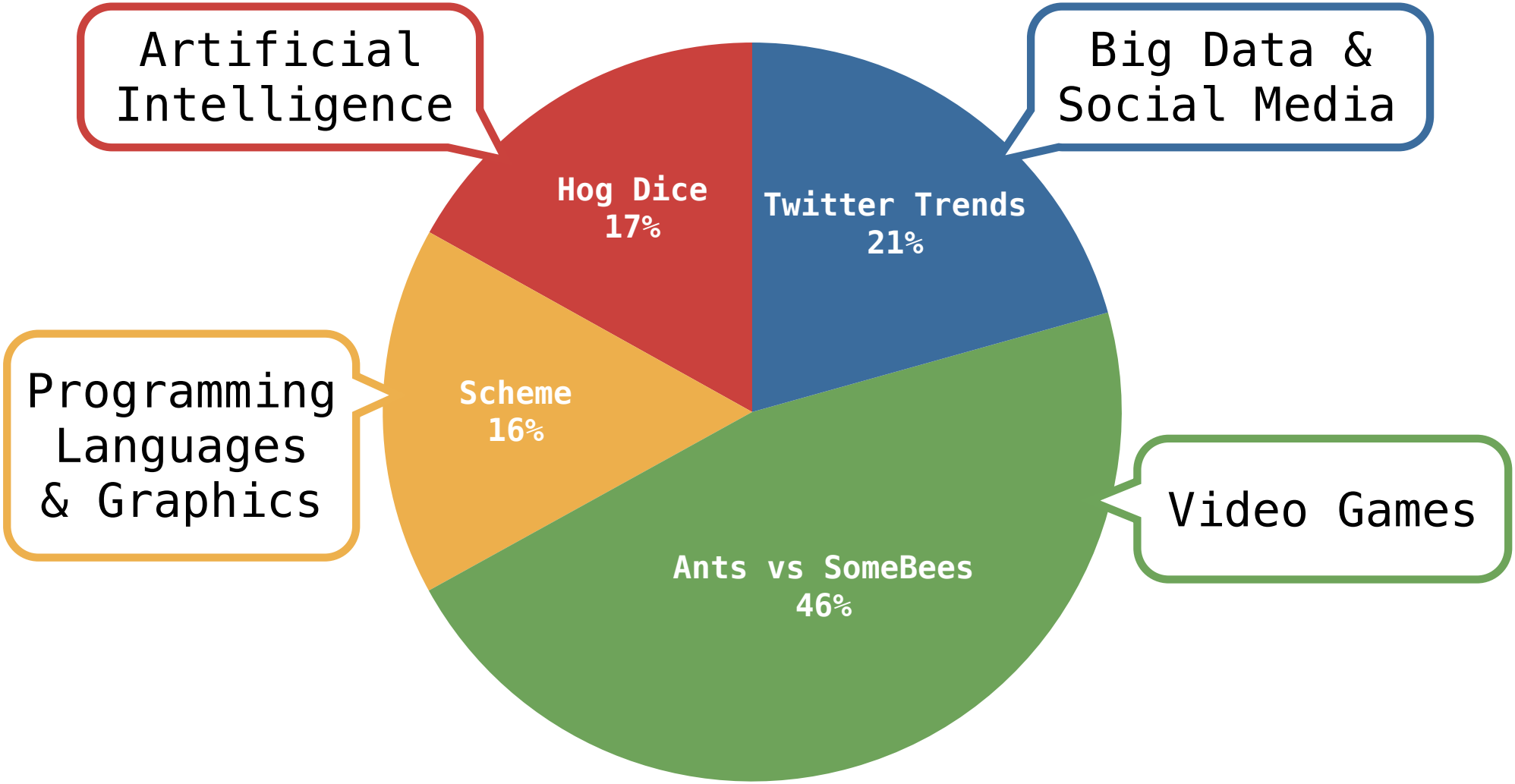
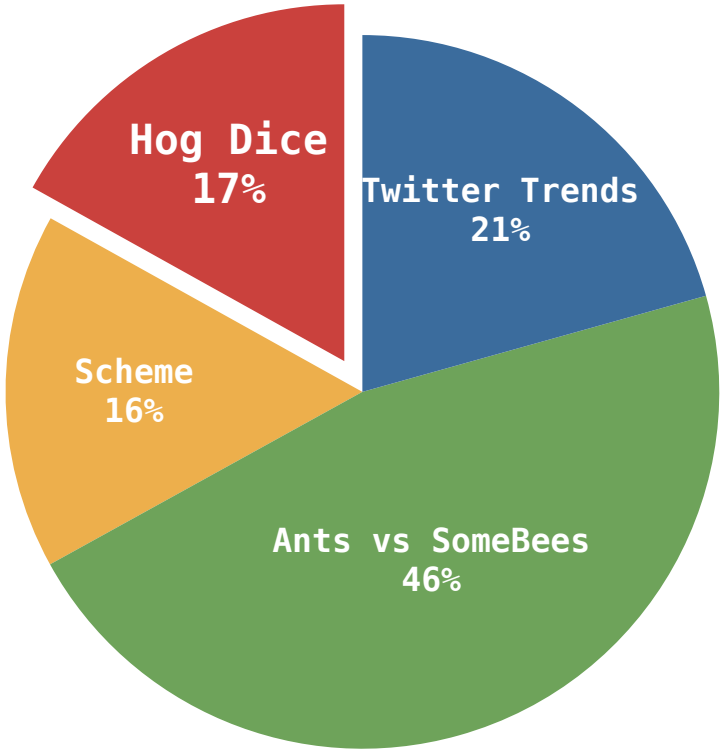


Rewarding Project Outcomes: Hog Dice

The Hog strategy contest encourages exploration



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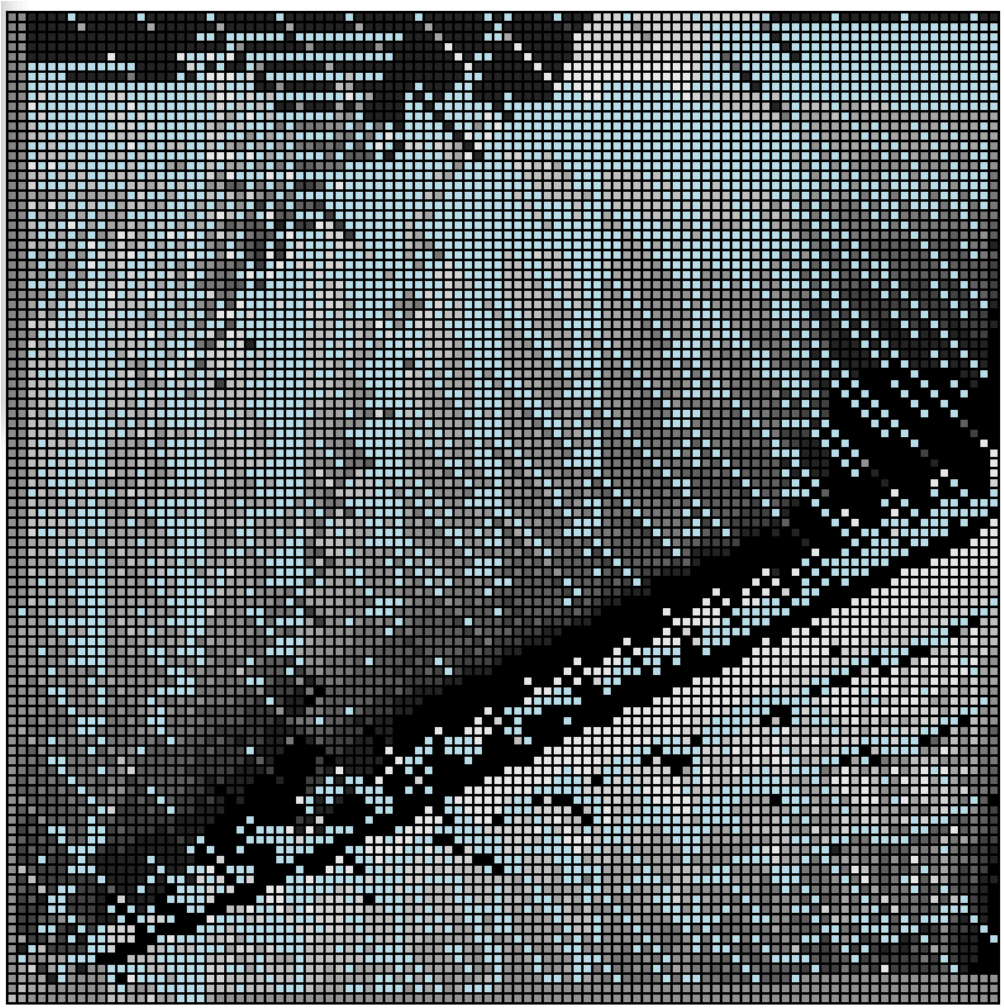

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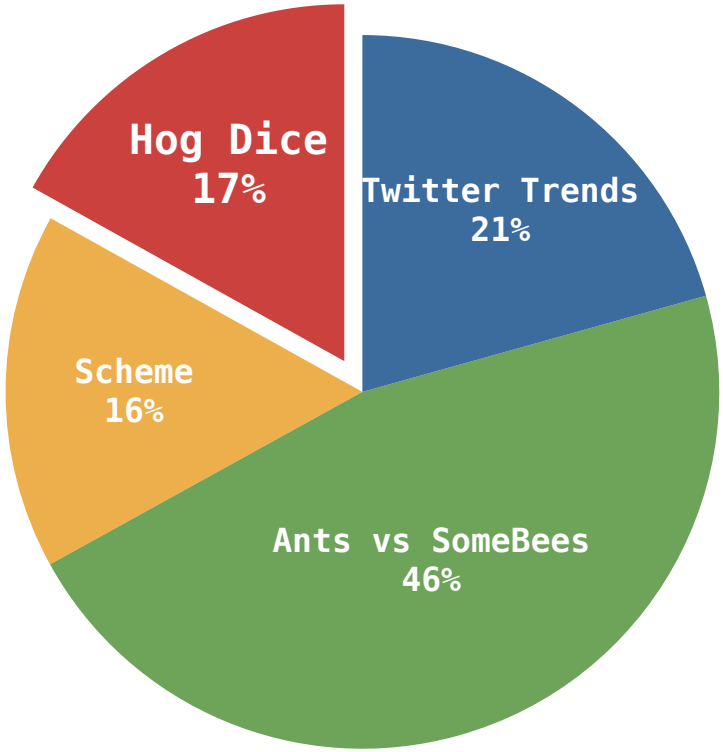

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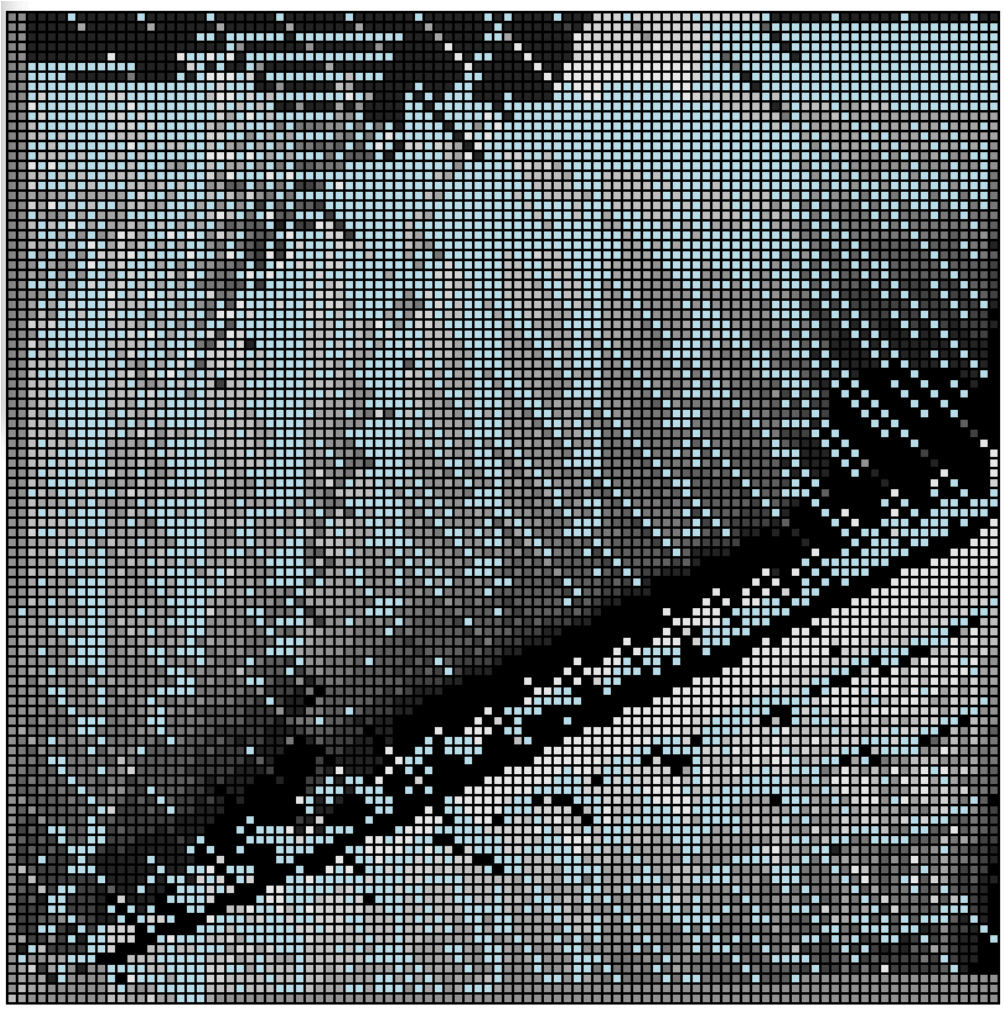

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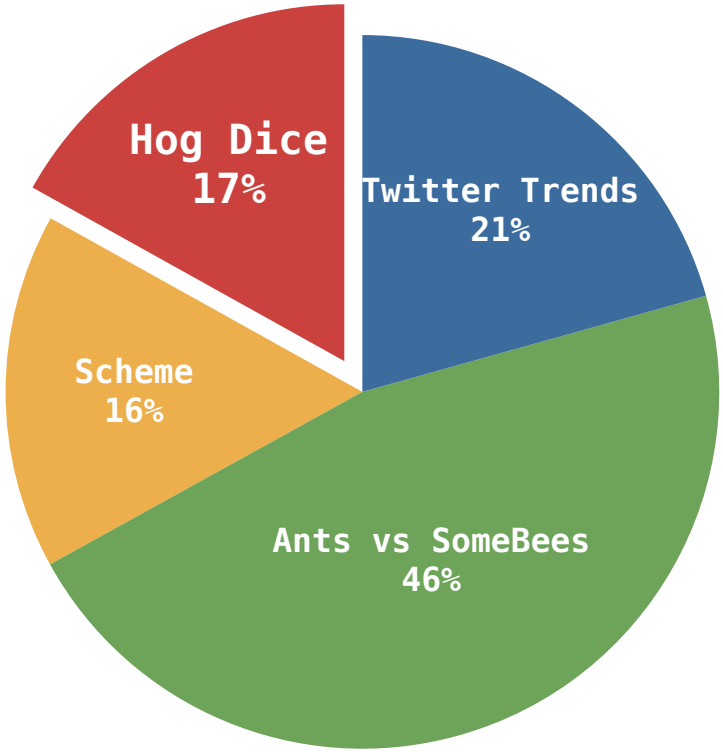
Visualization created for a student blog post



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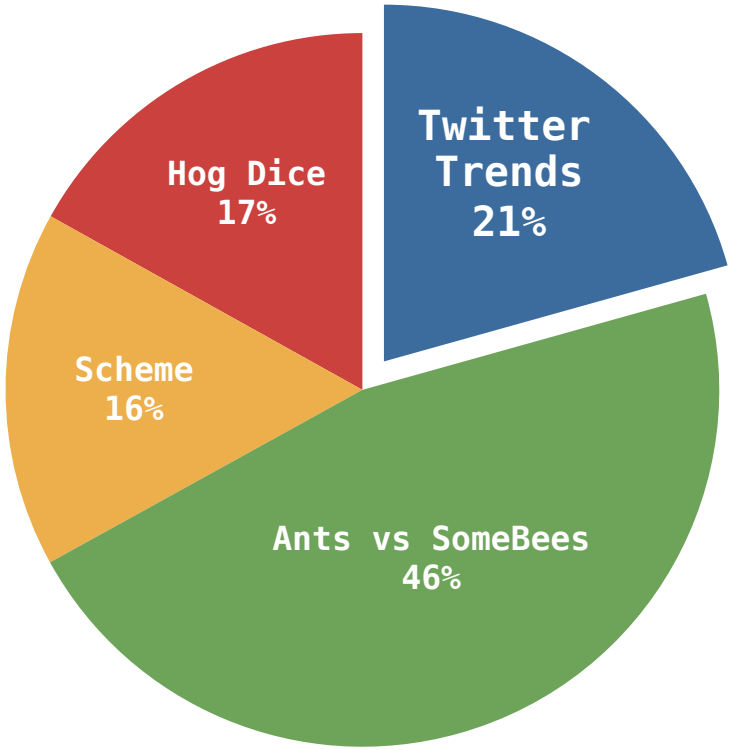

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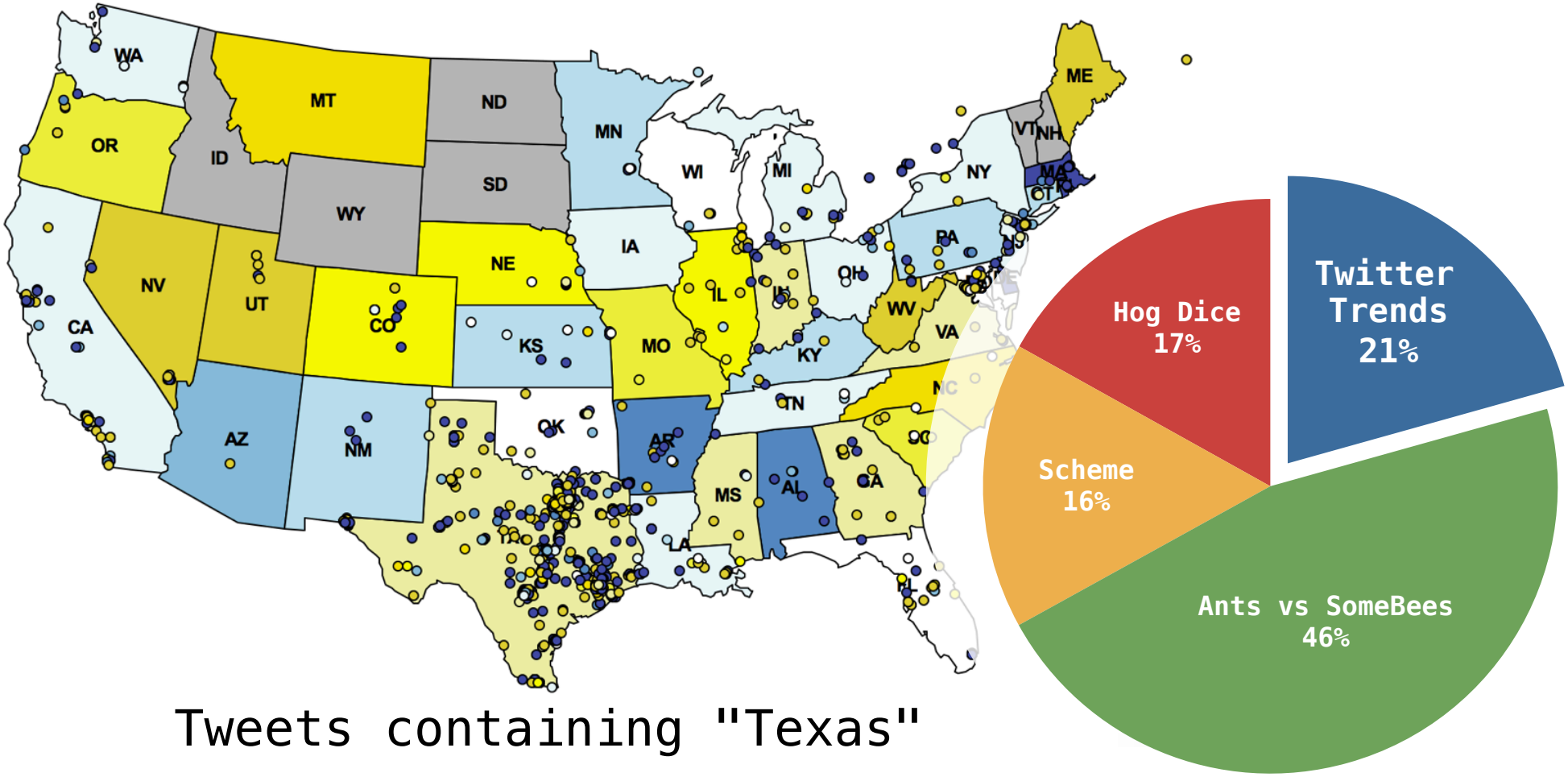

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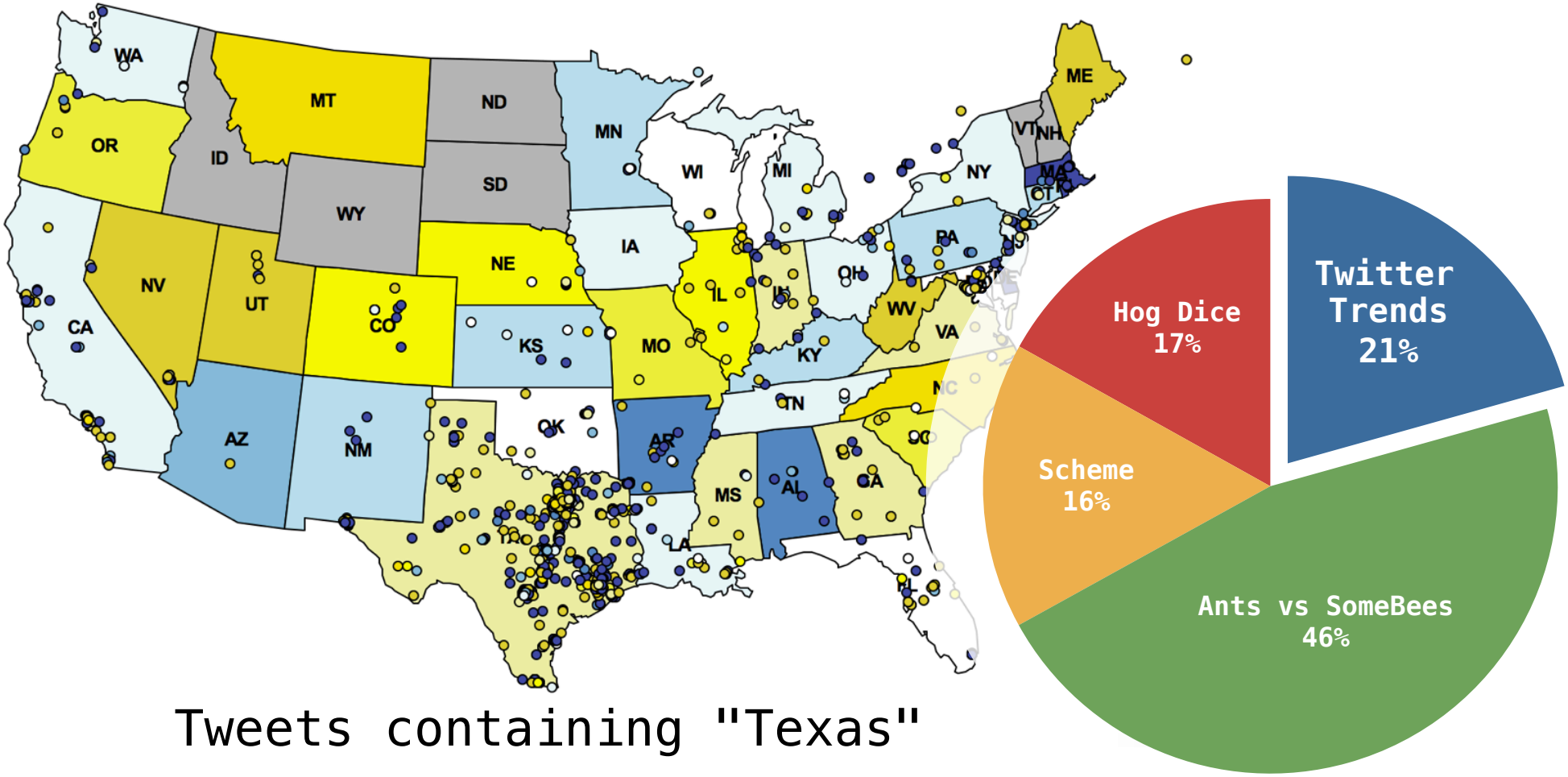

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Nifty Assignments Track, SIGCSE 2013

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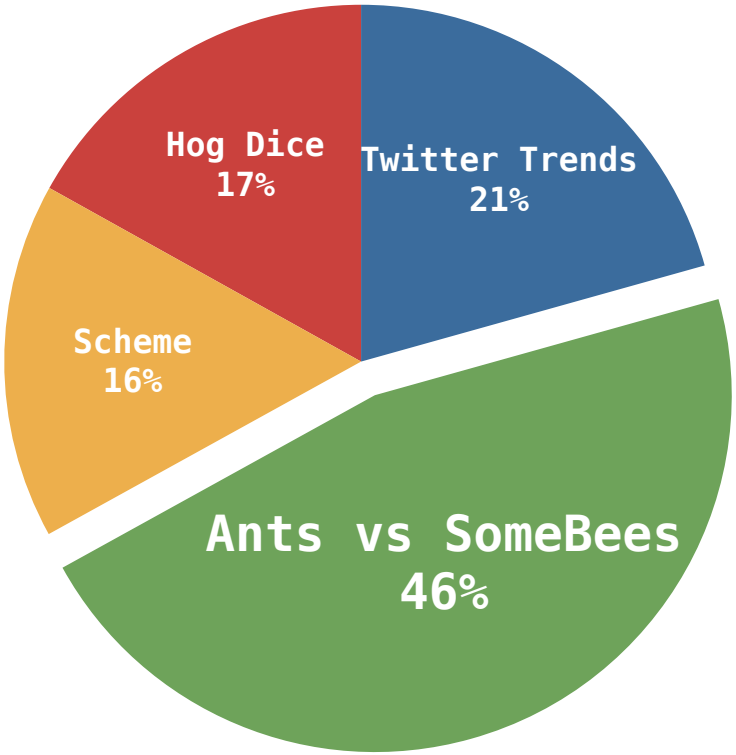

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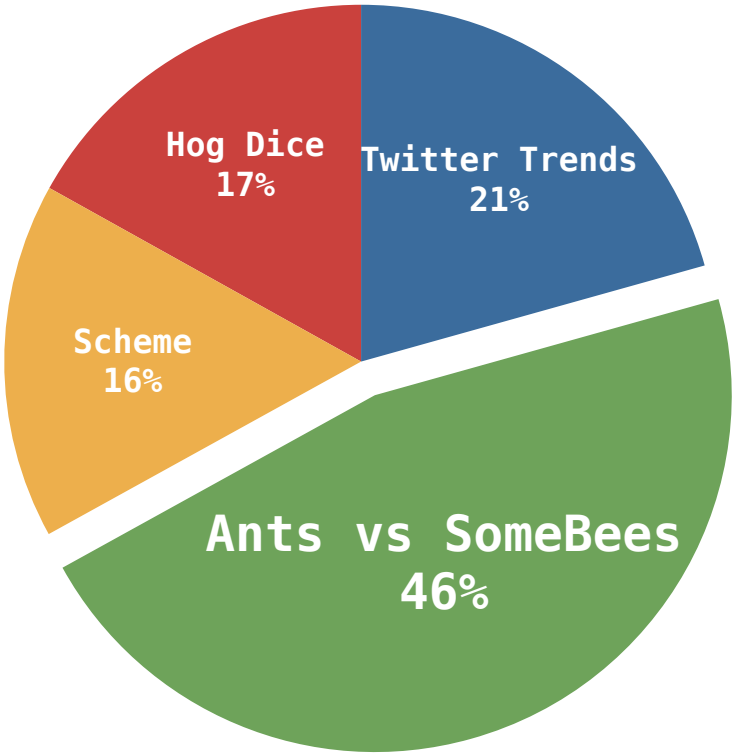

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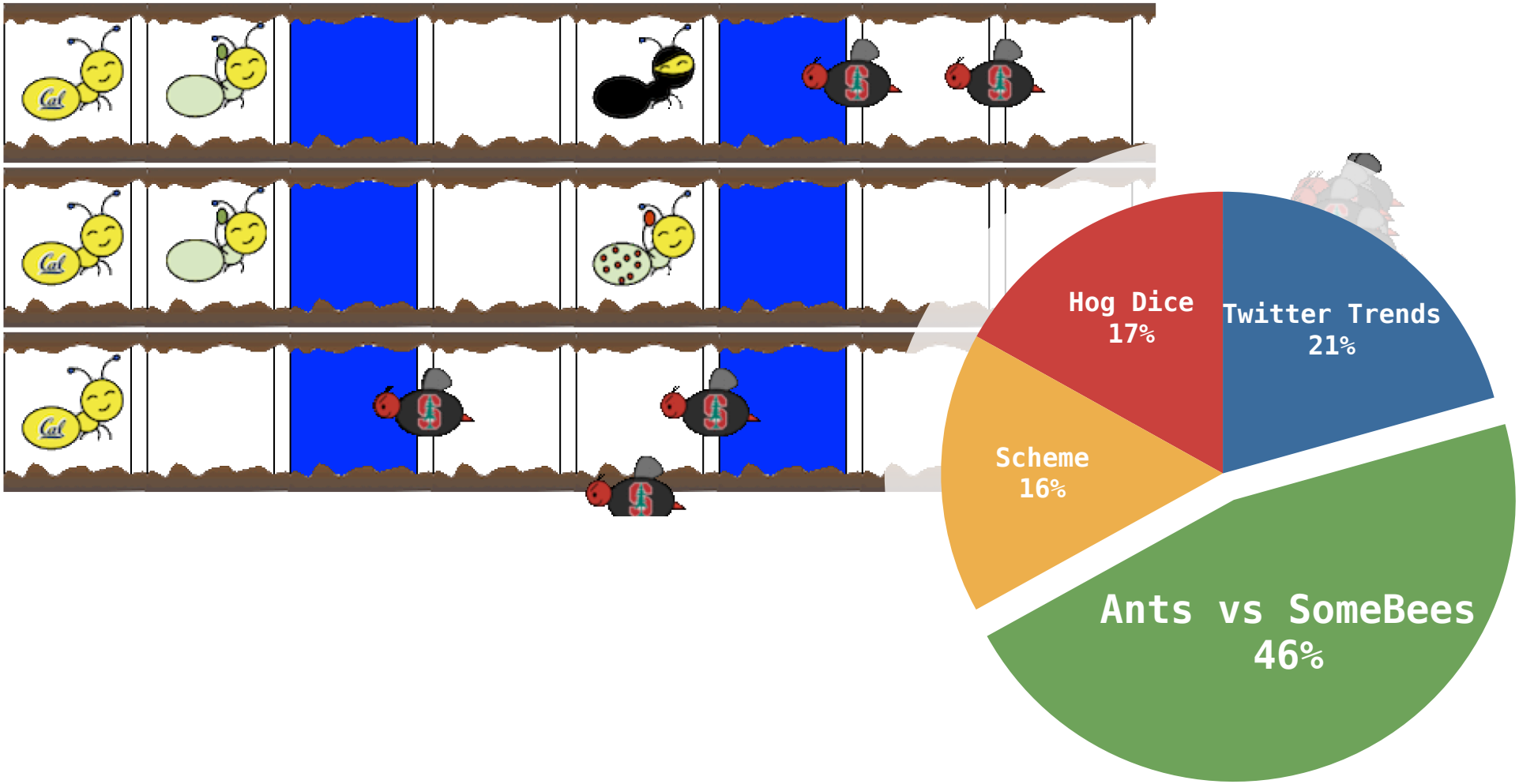

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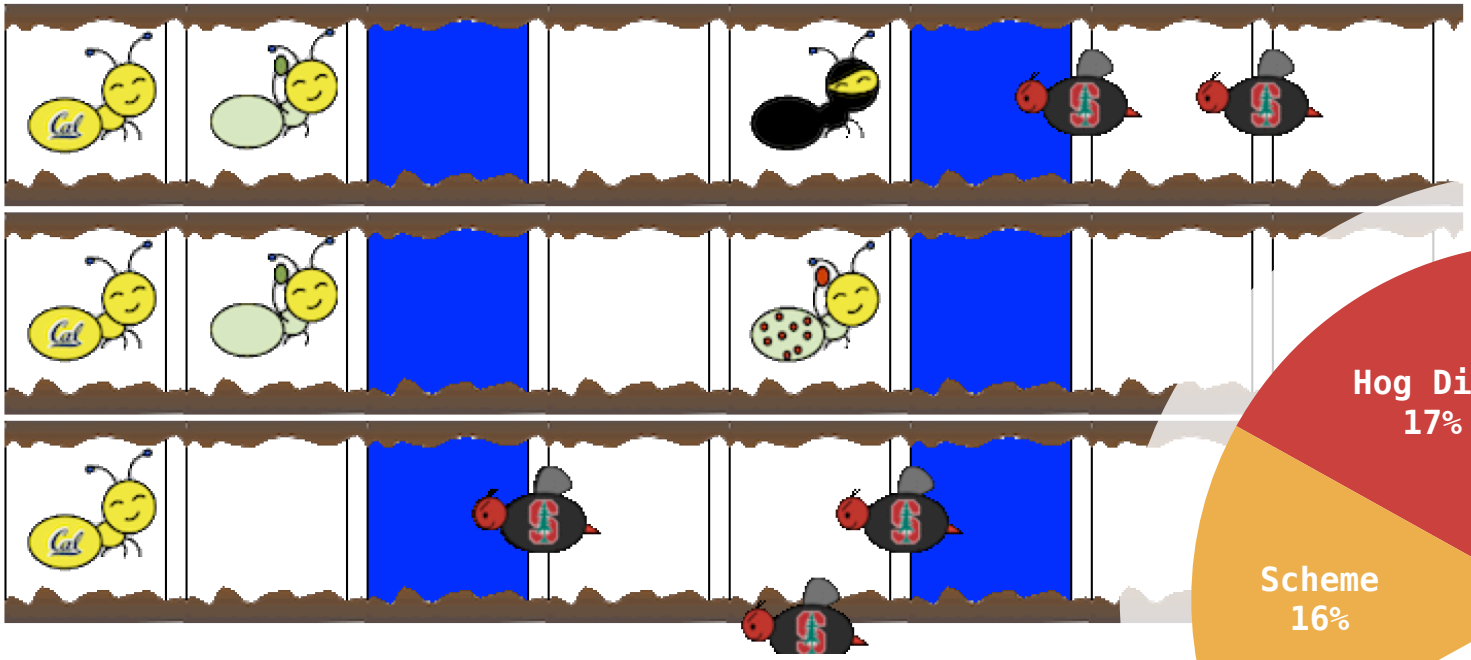

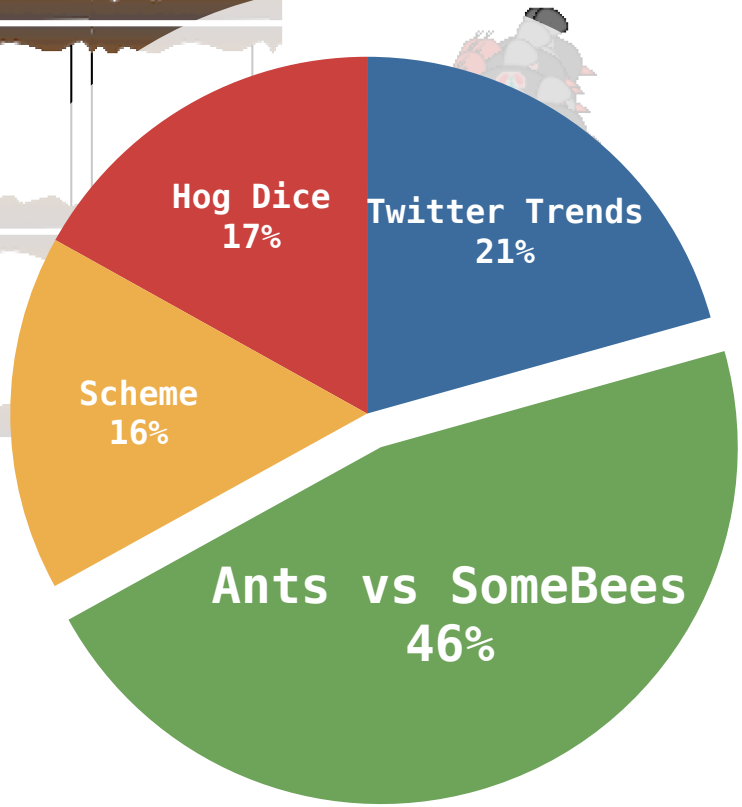

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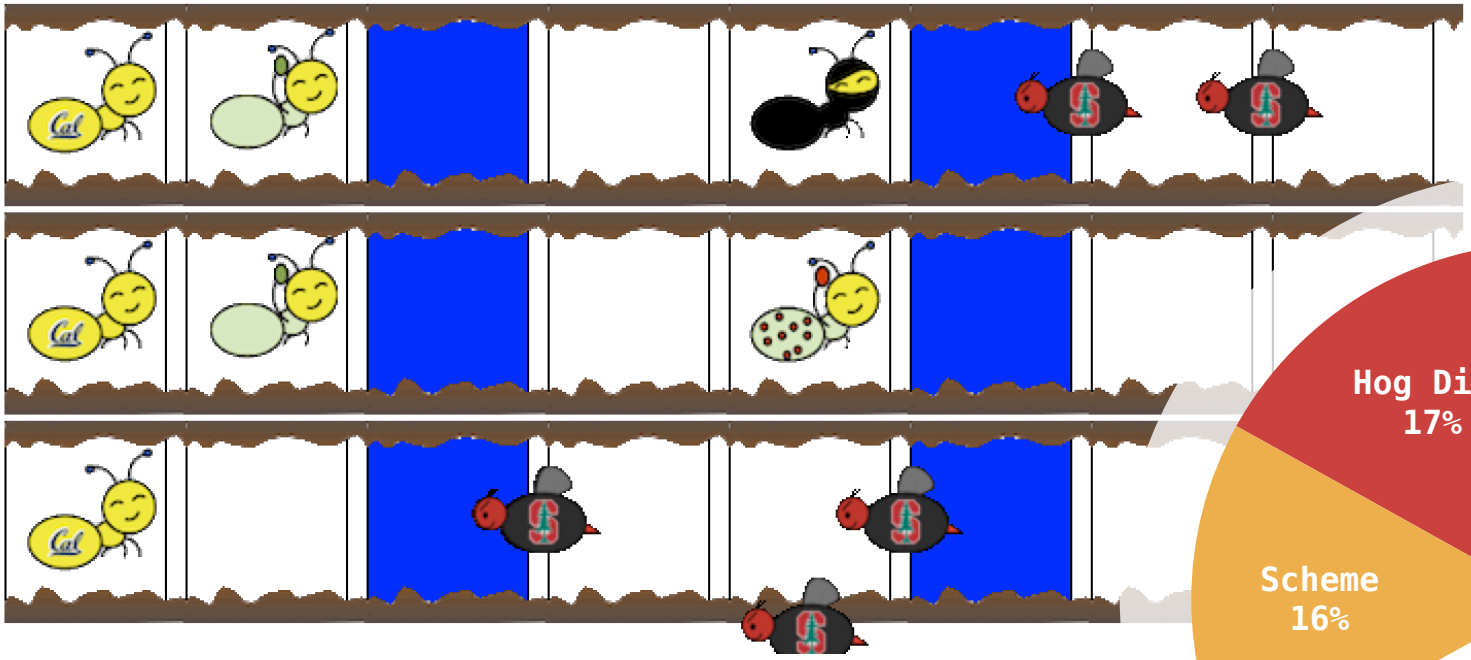

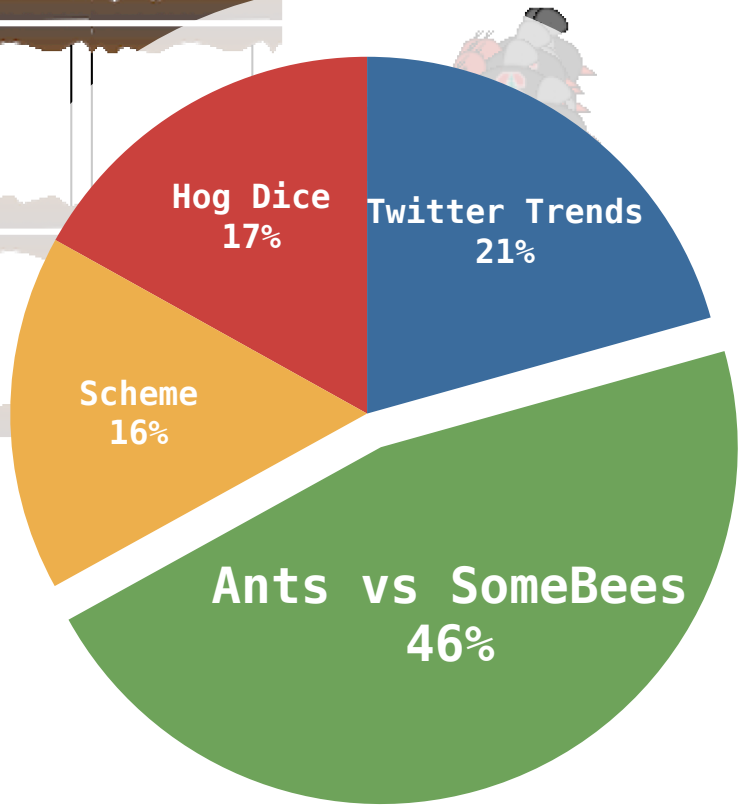

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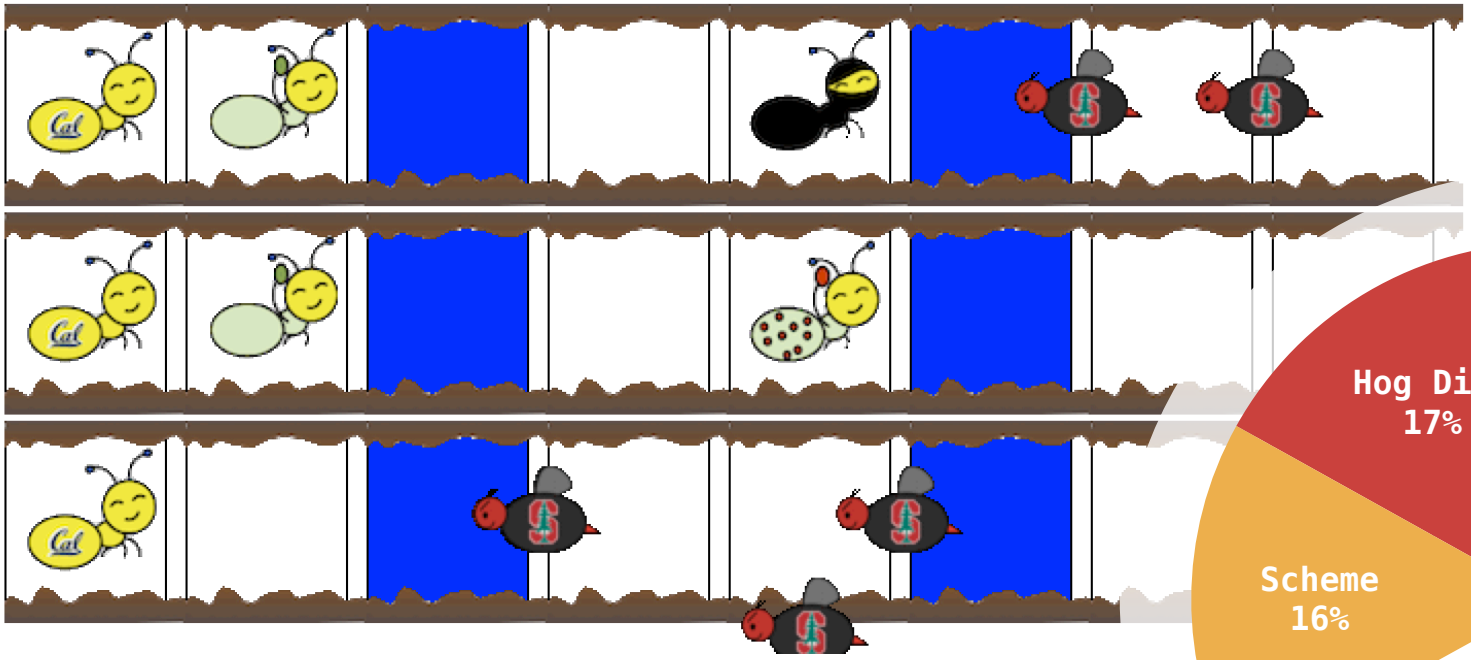

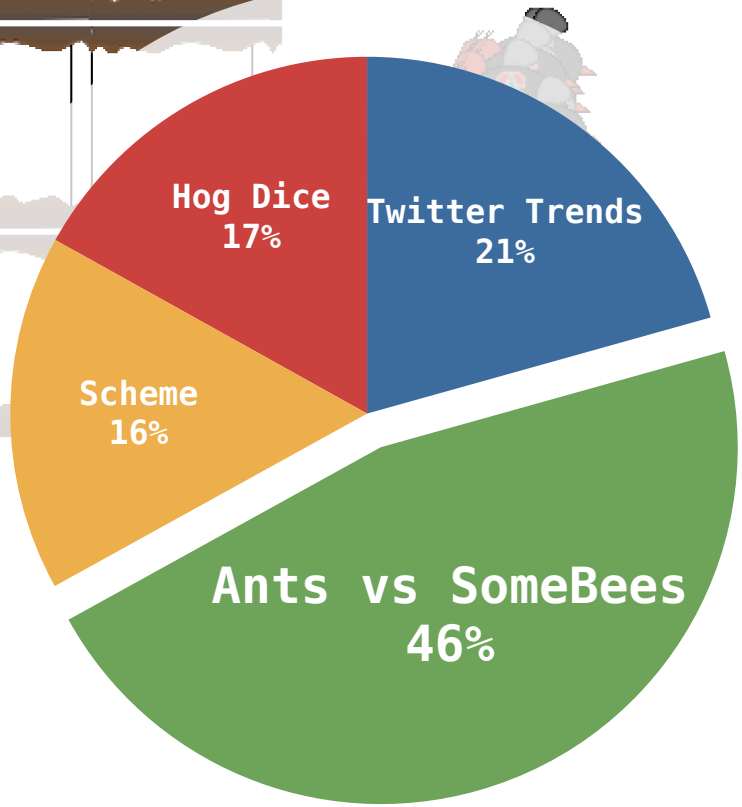

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Nifty Assignments Track, SIGCSE 2014

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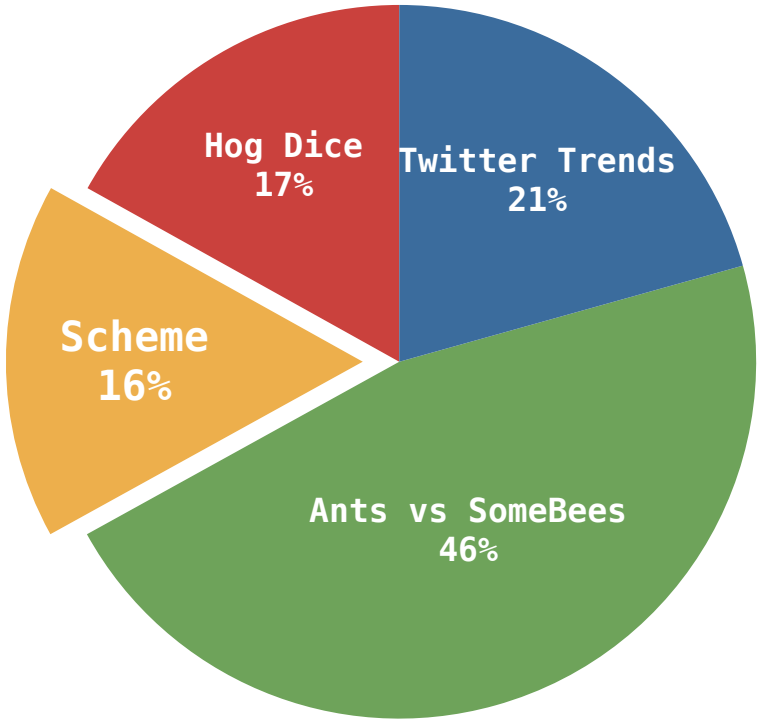

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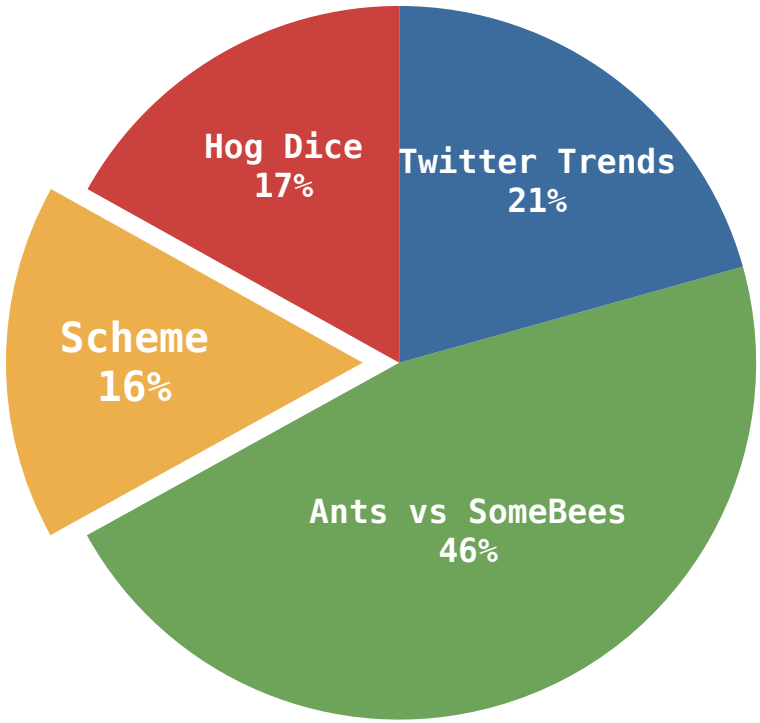

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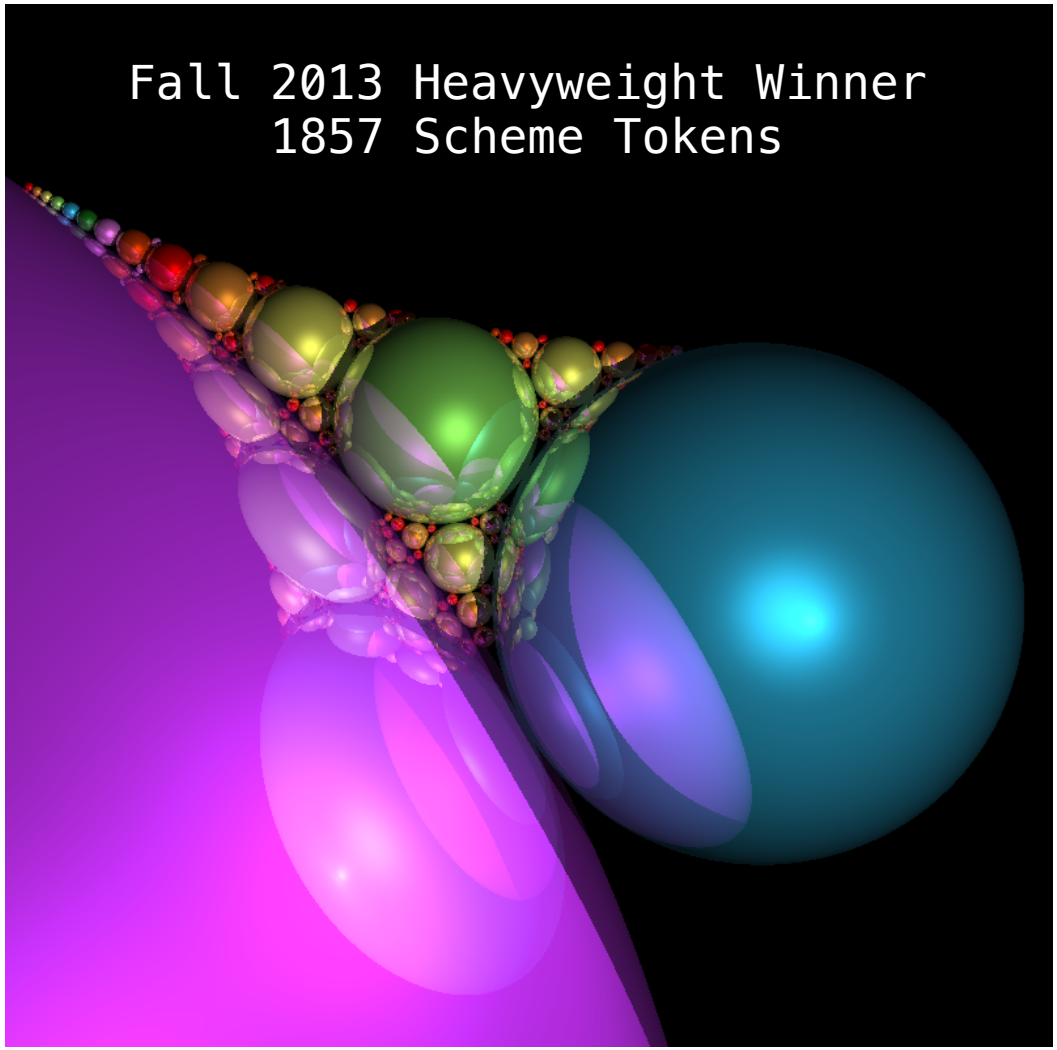

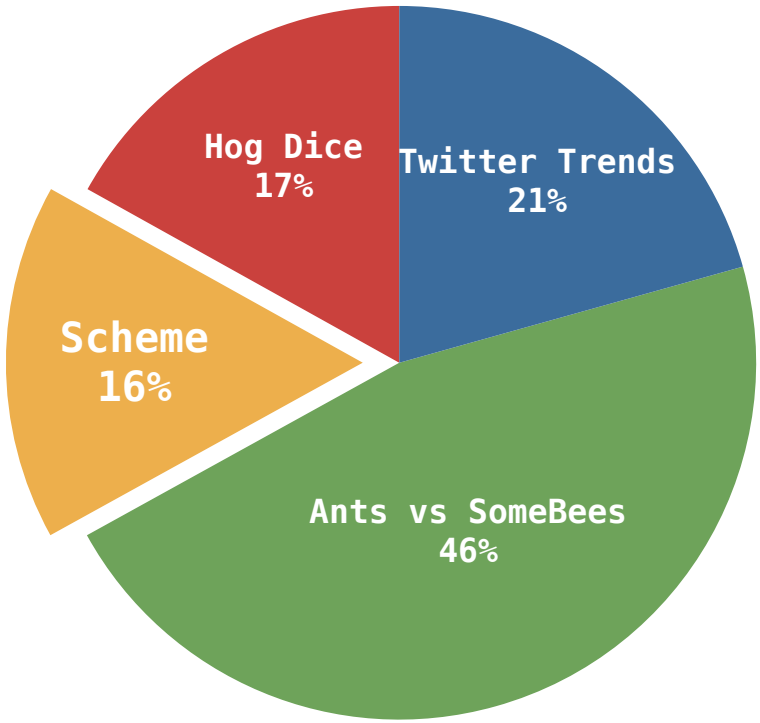

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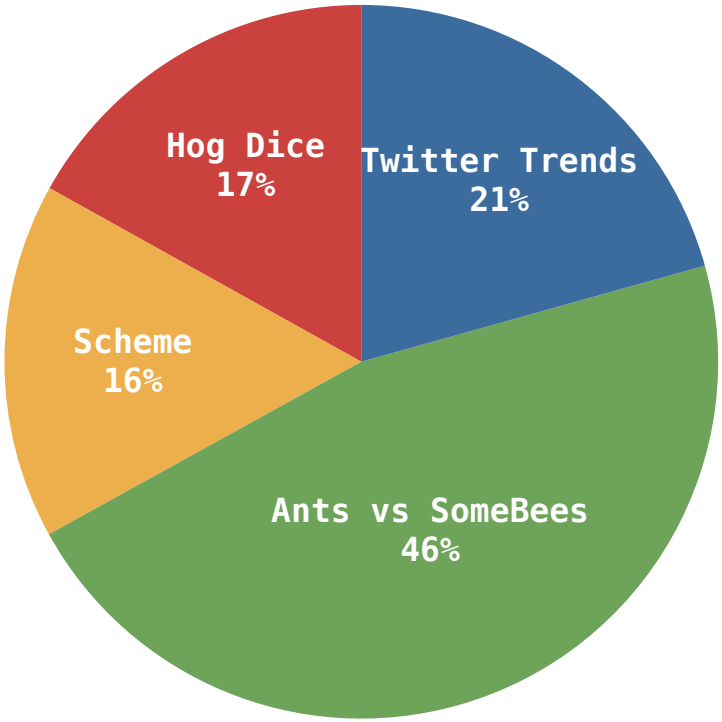

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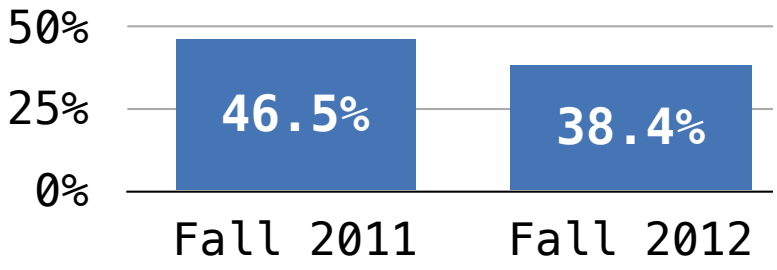

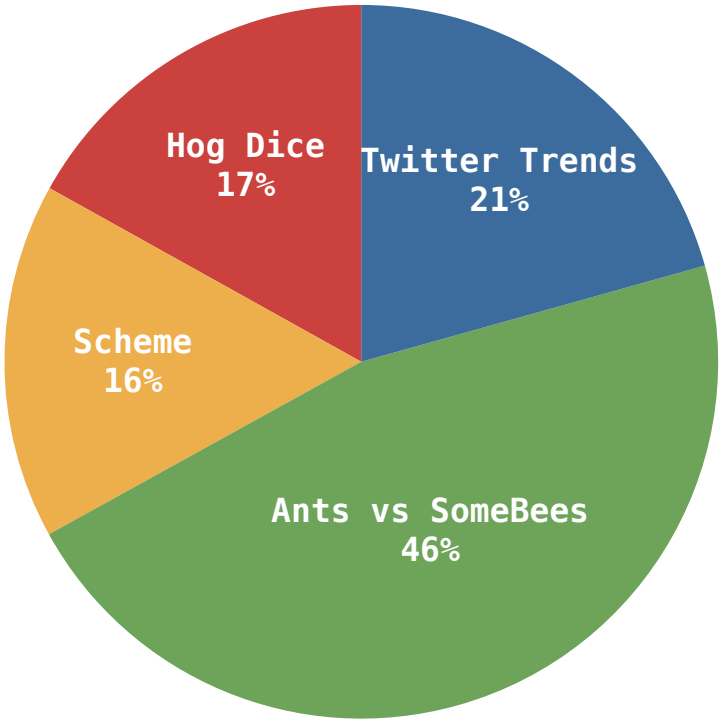

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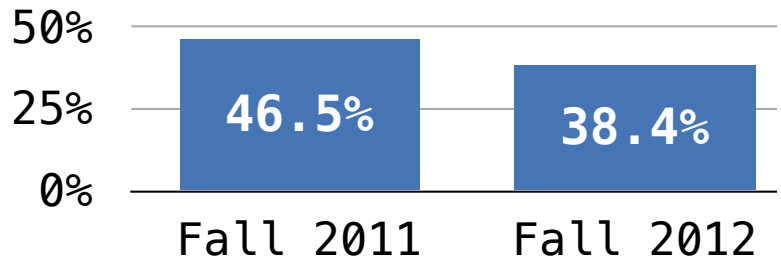

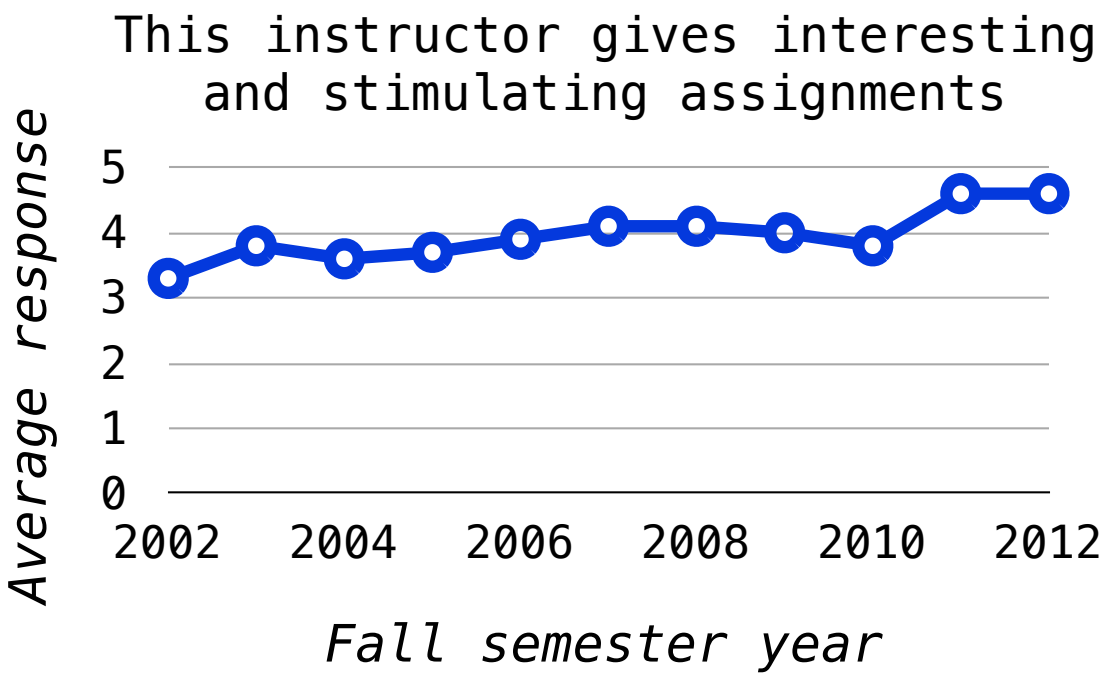

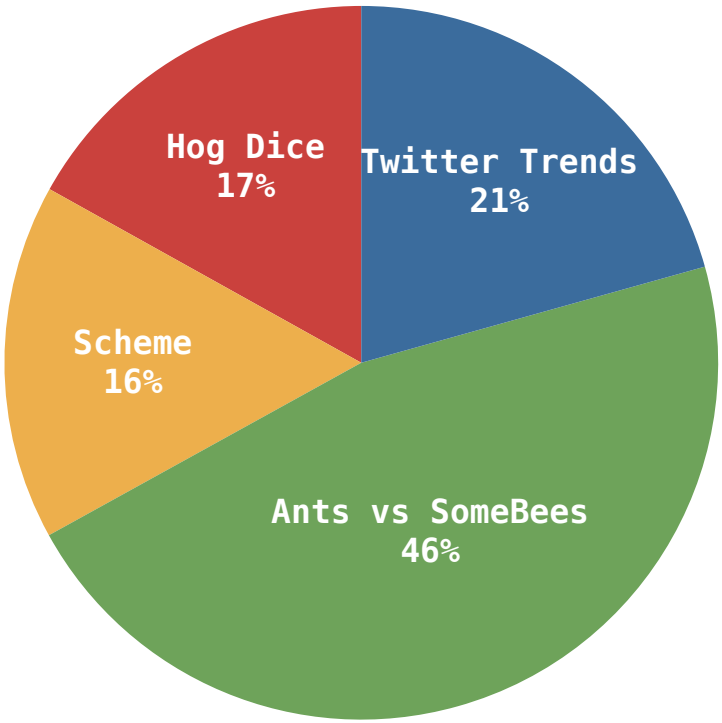

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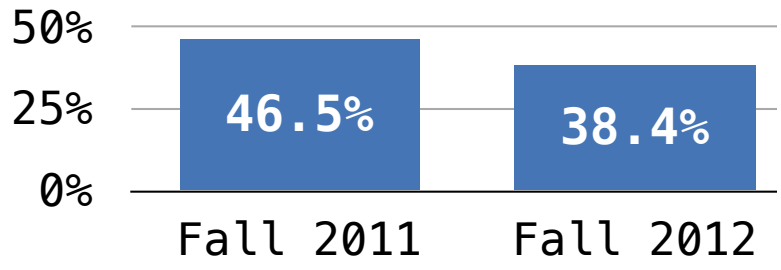

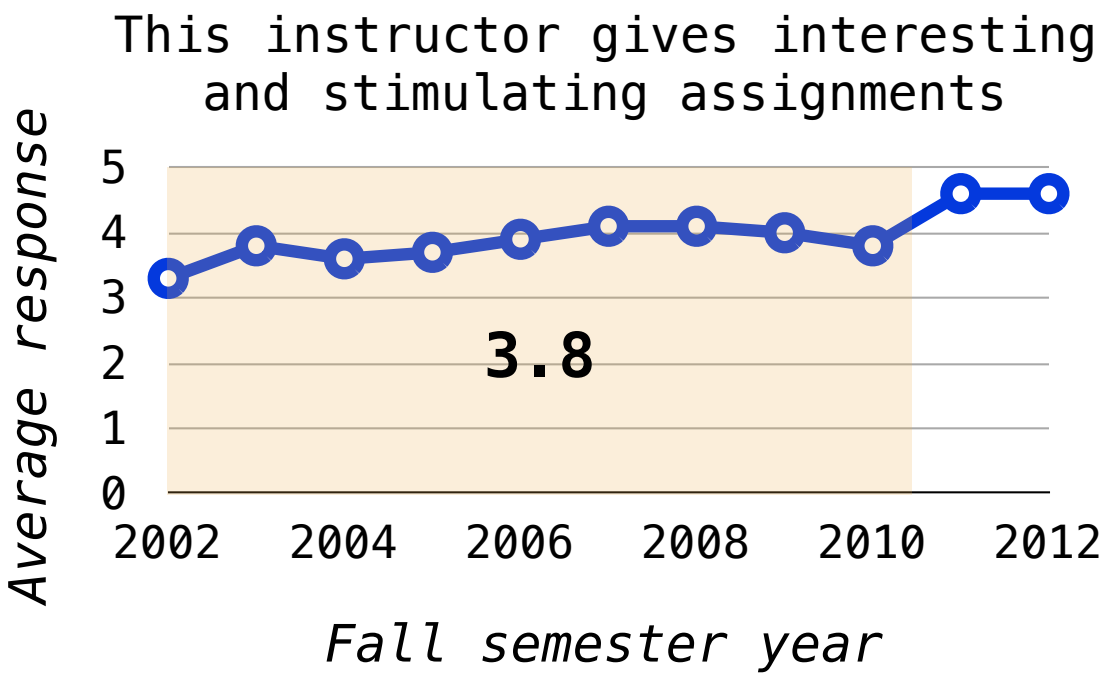

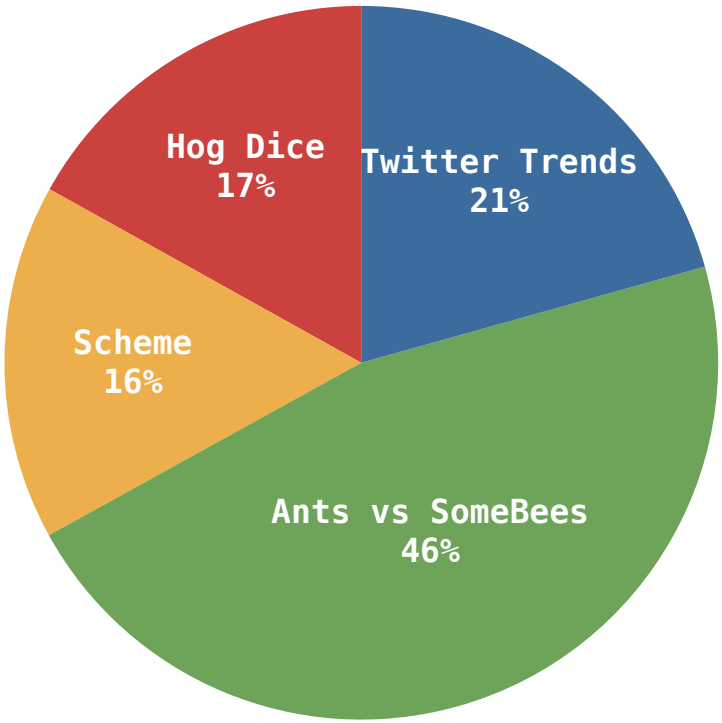

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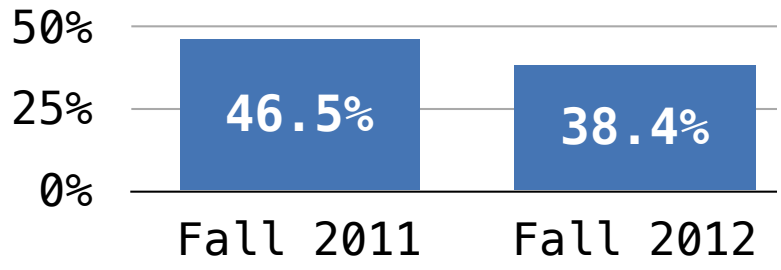

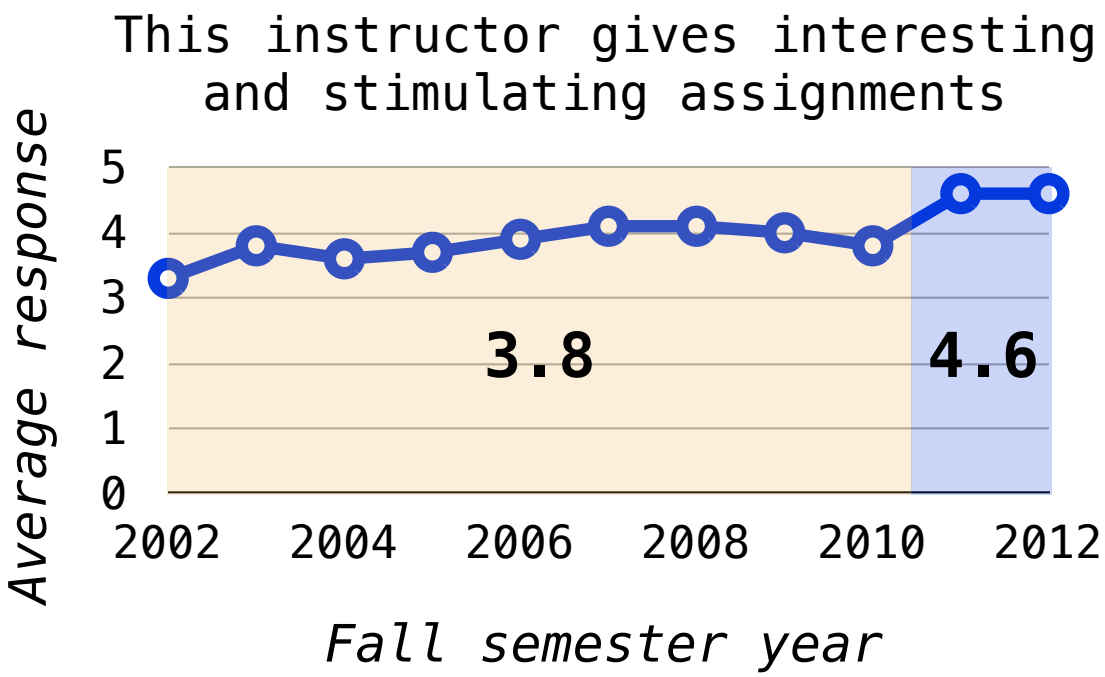

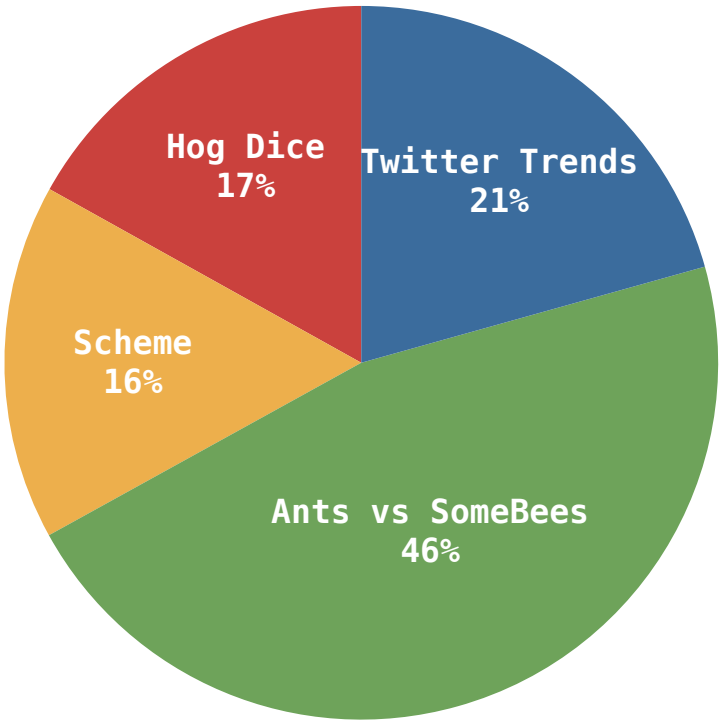

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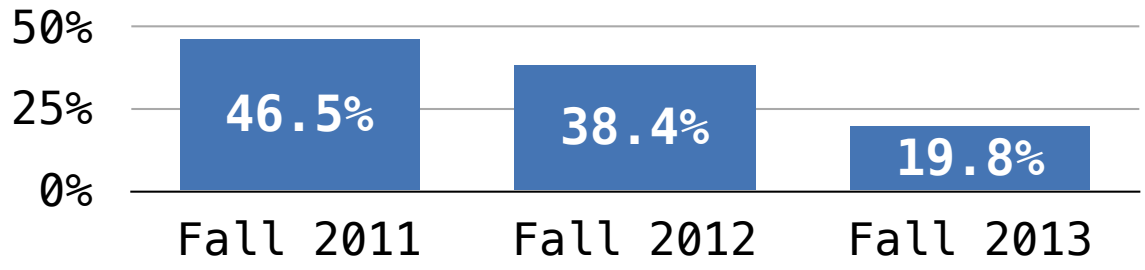

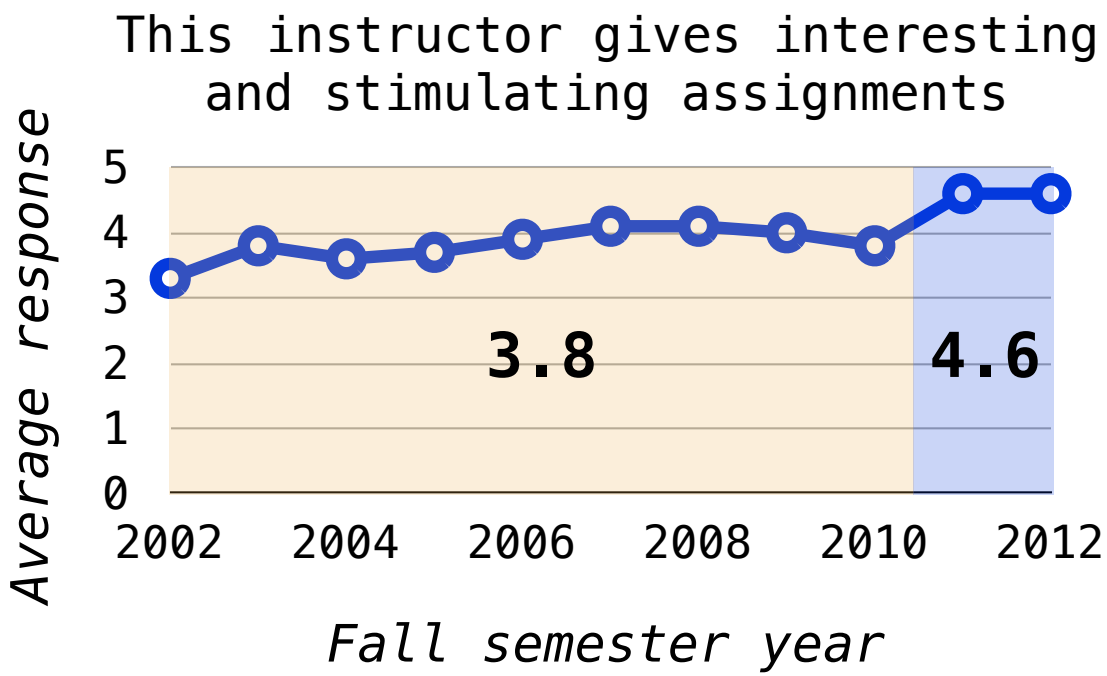

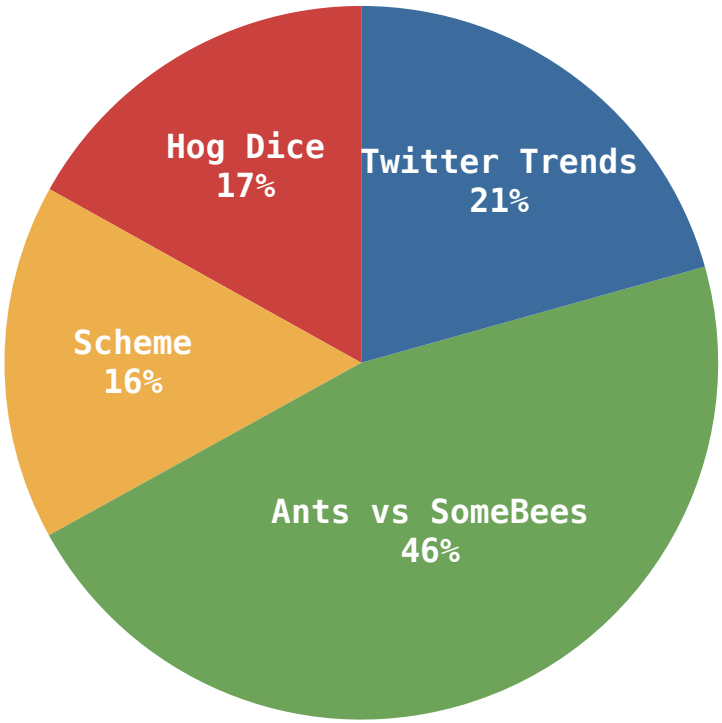

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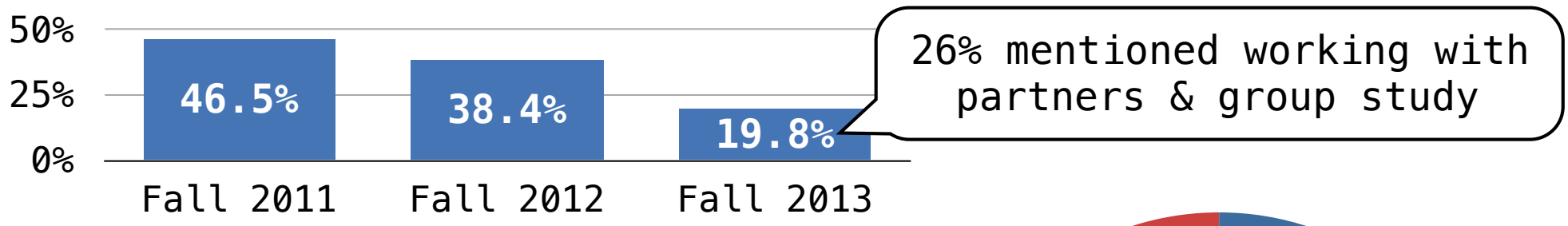

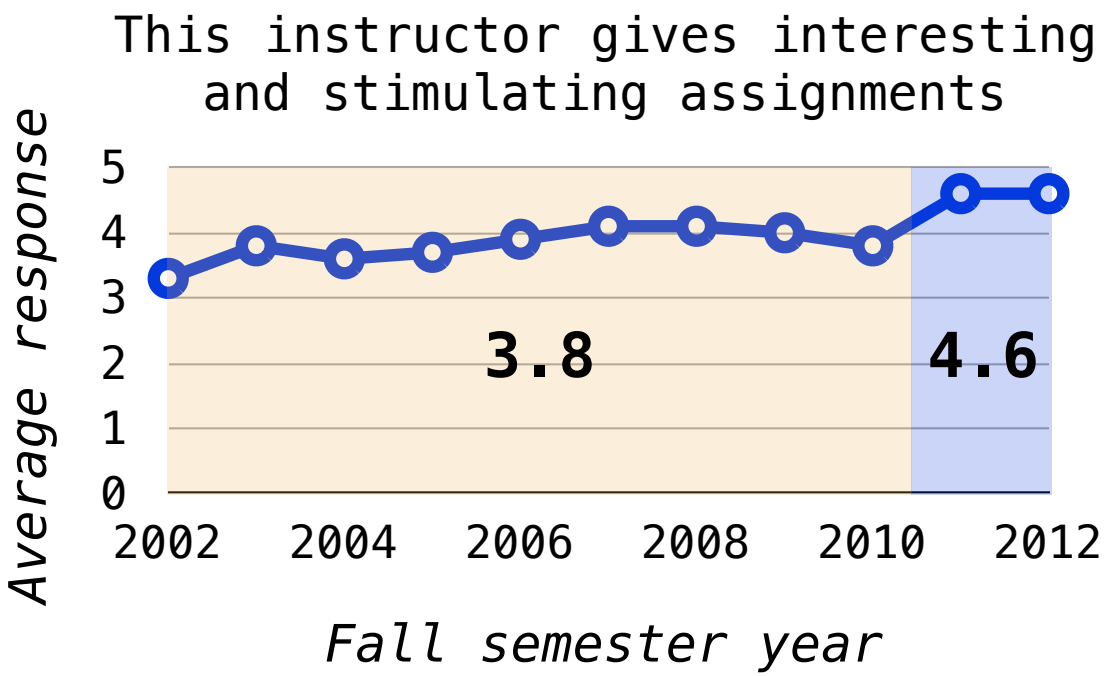

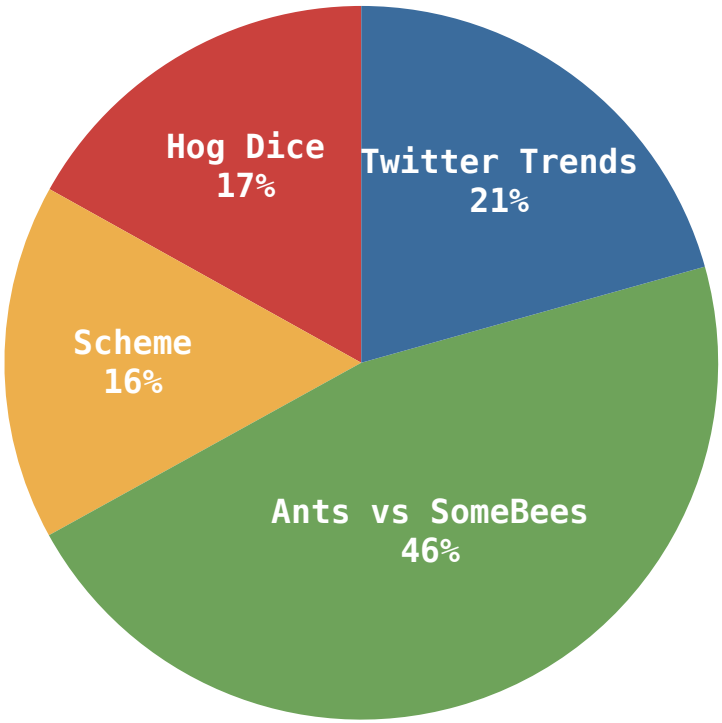

Community

Community and Collaboration Guidelines

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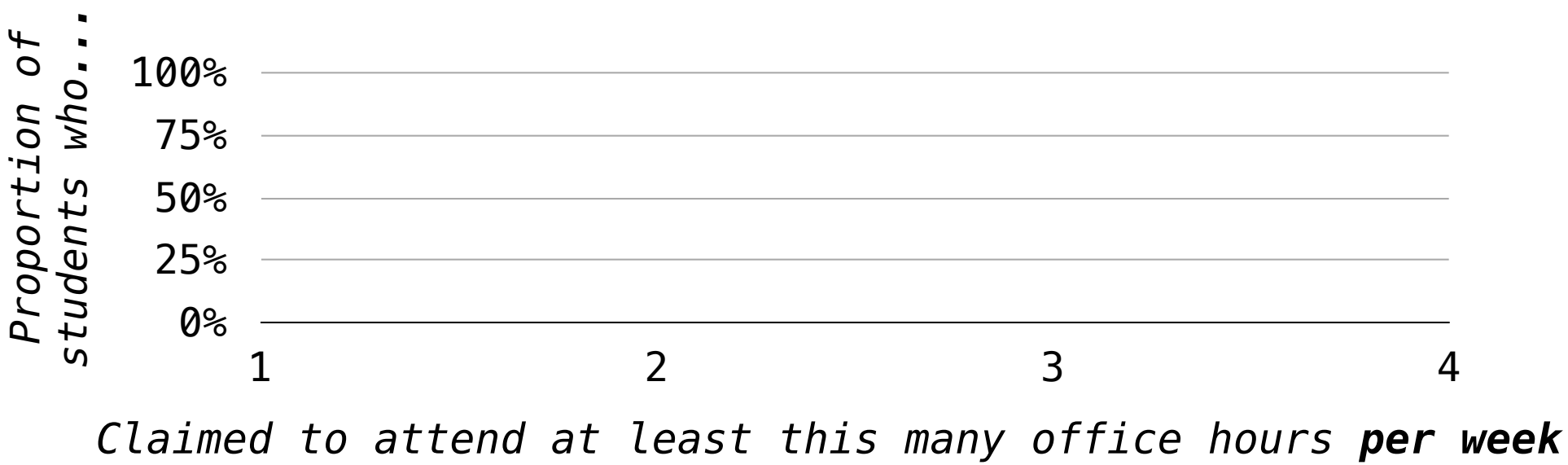

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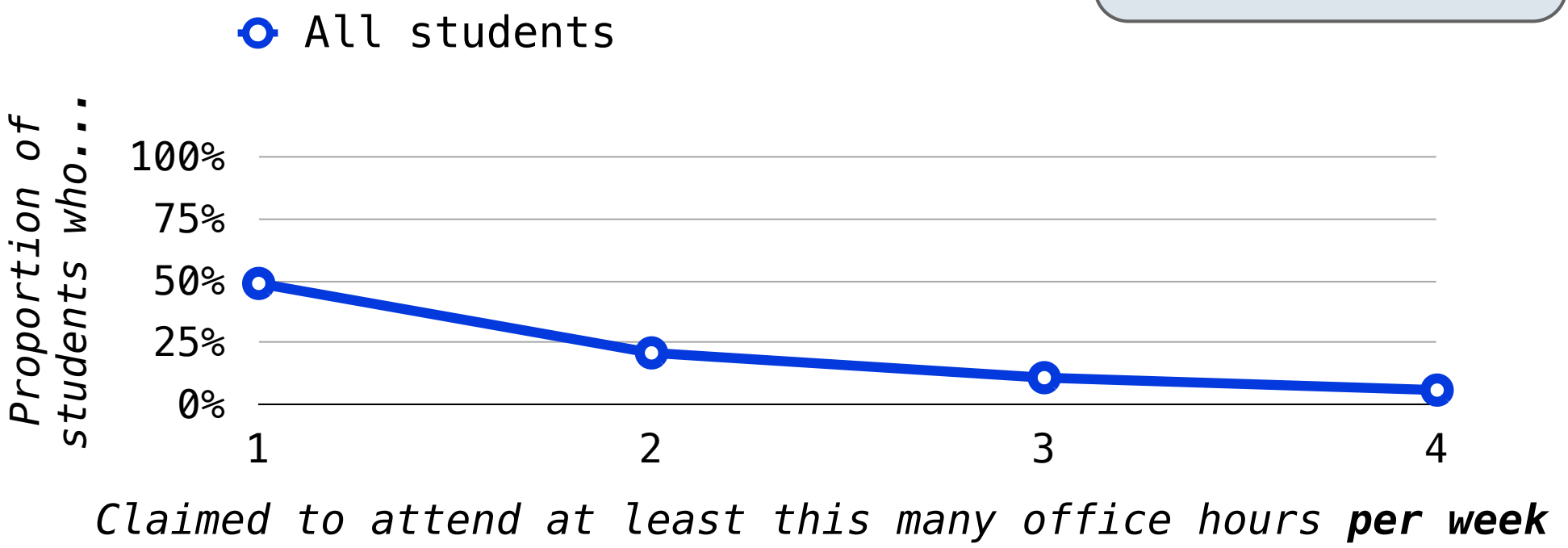

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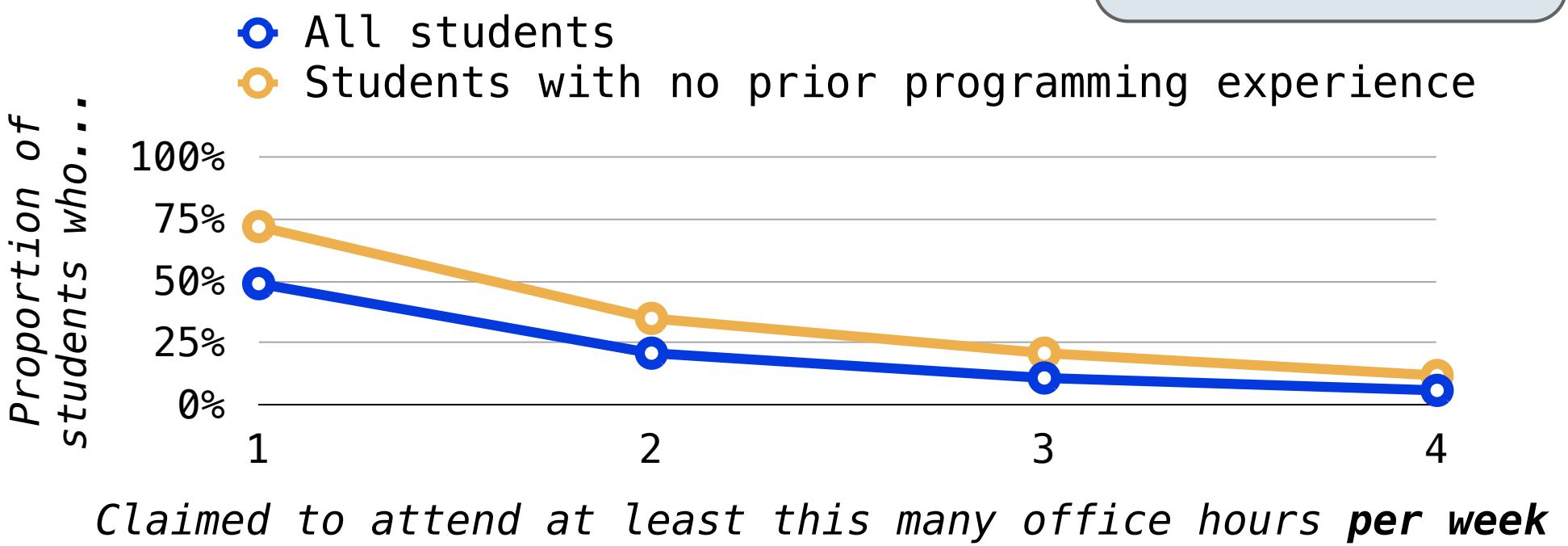

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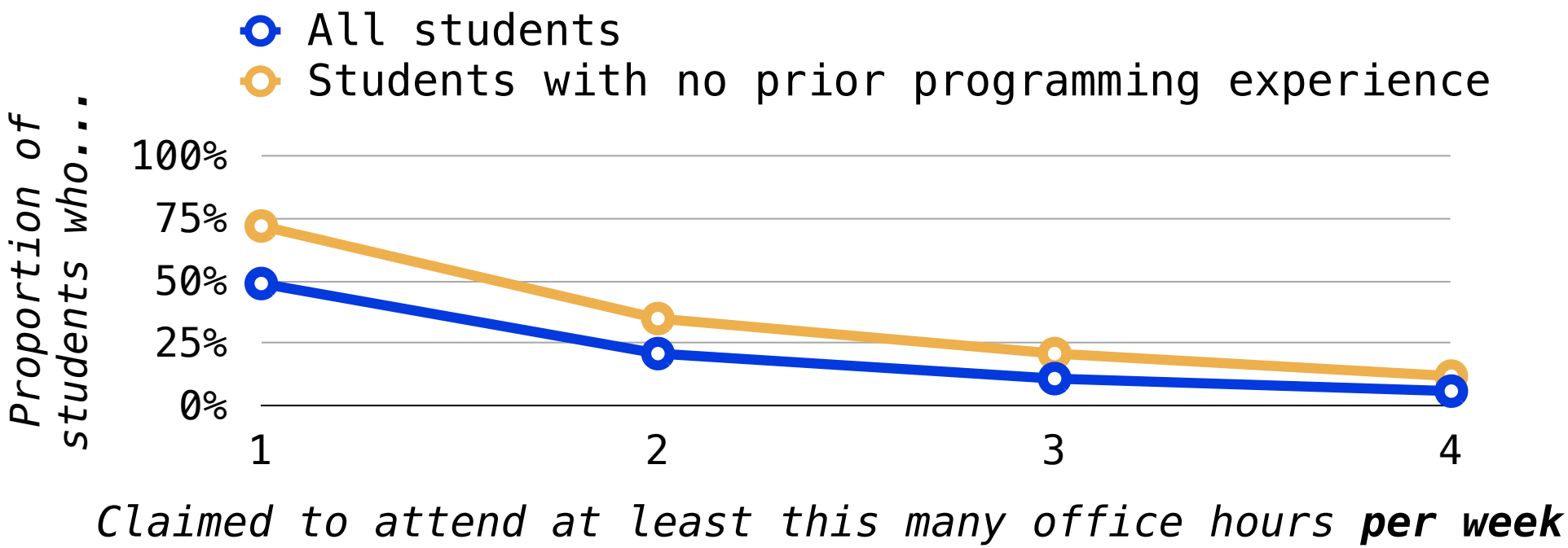

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python

Materials & Tools

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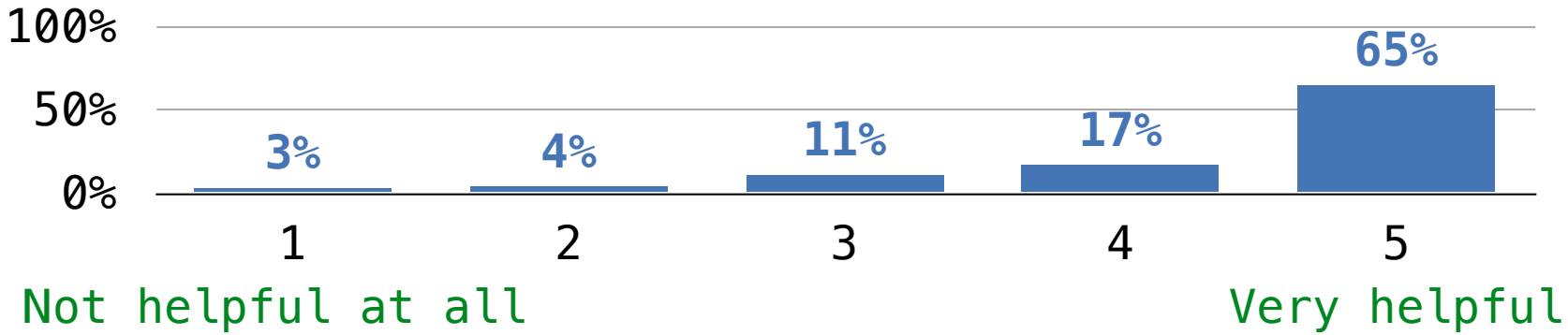
How helpful did you find the online tool for drawing environment diagrams in understanding course material?



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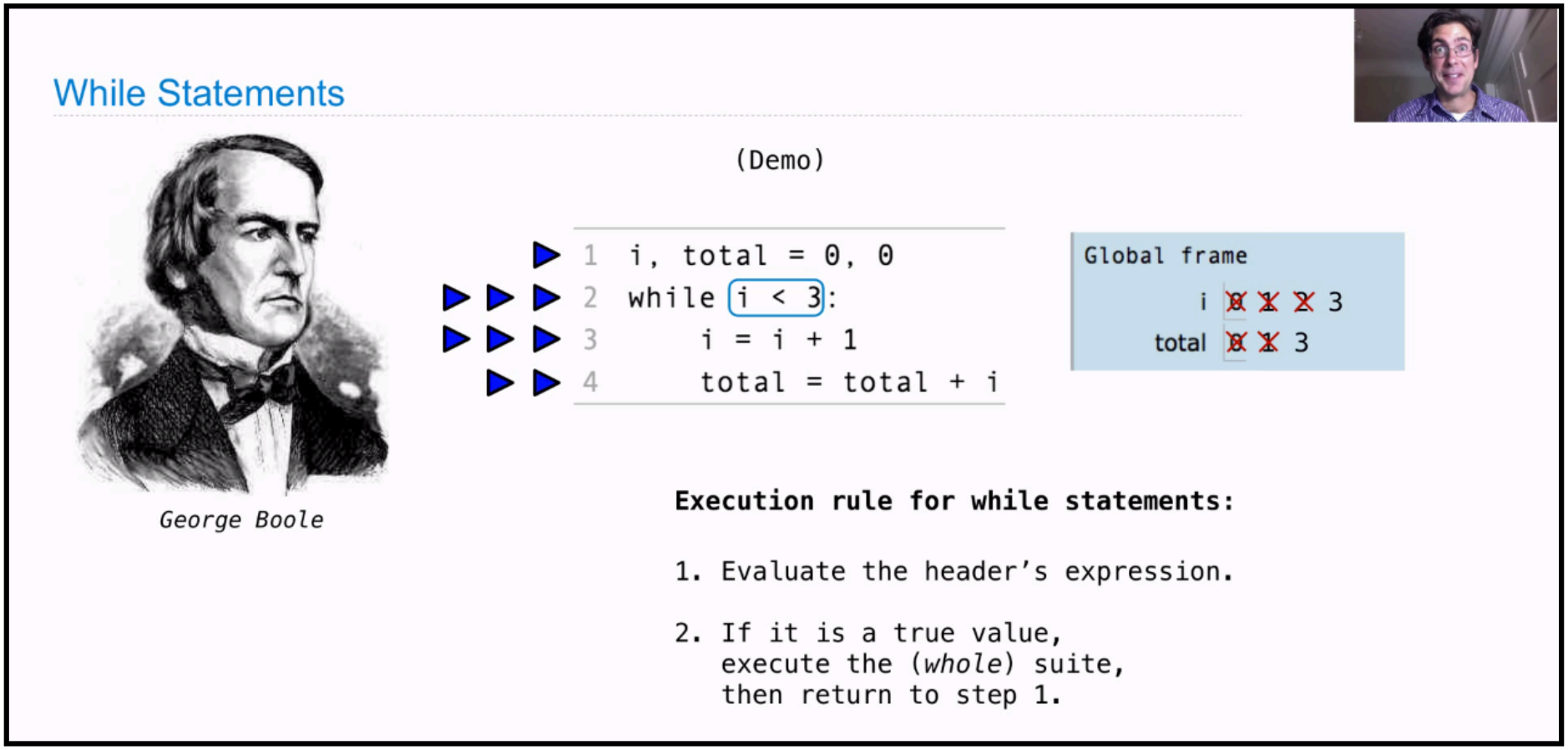

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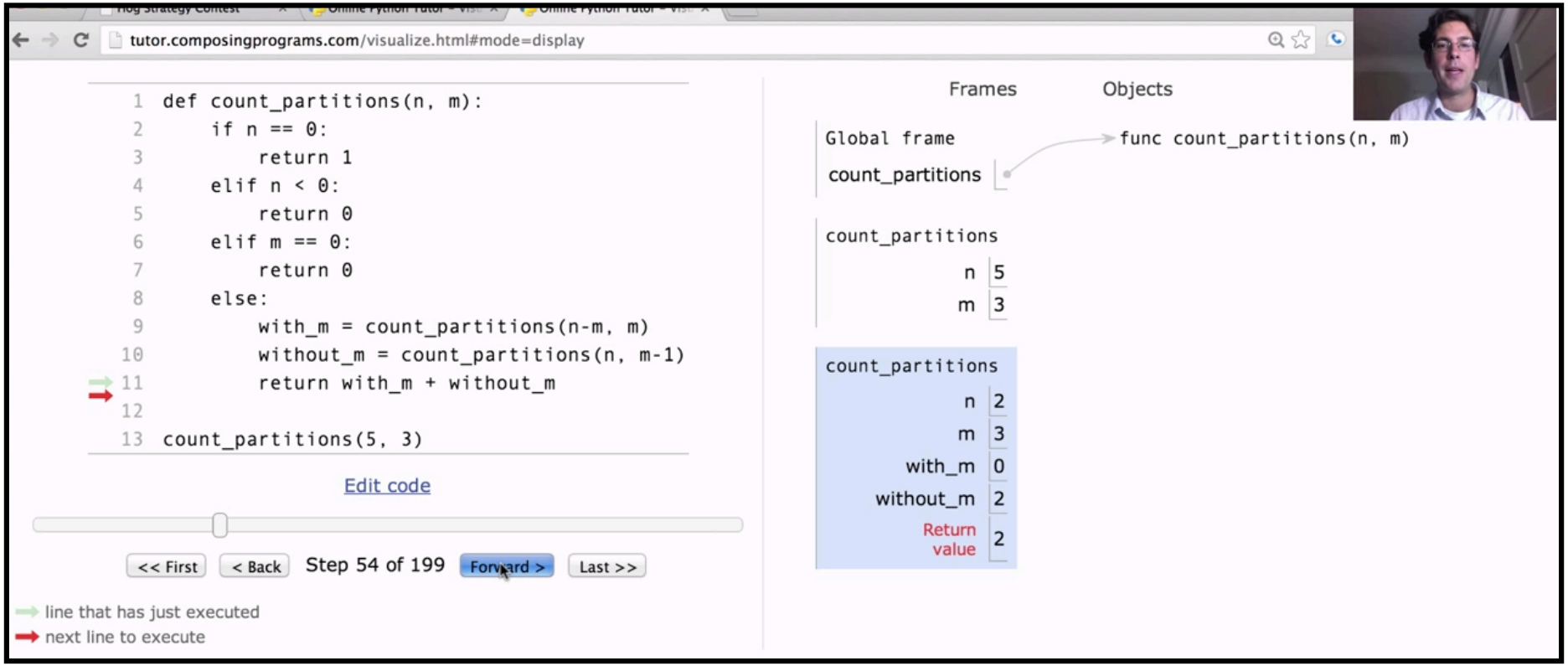

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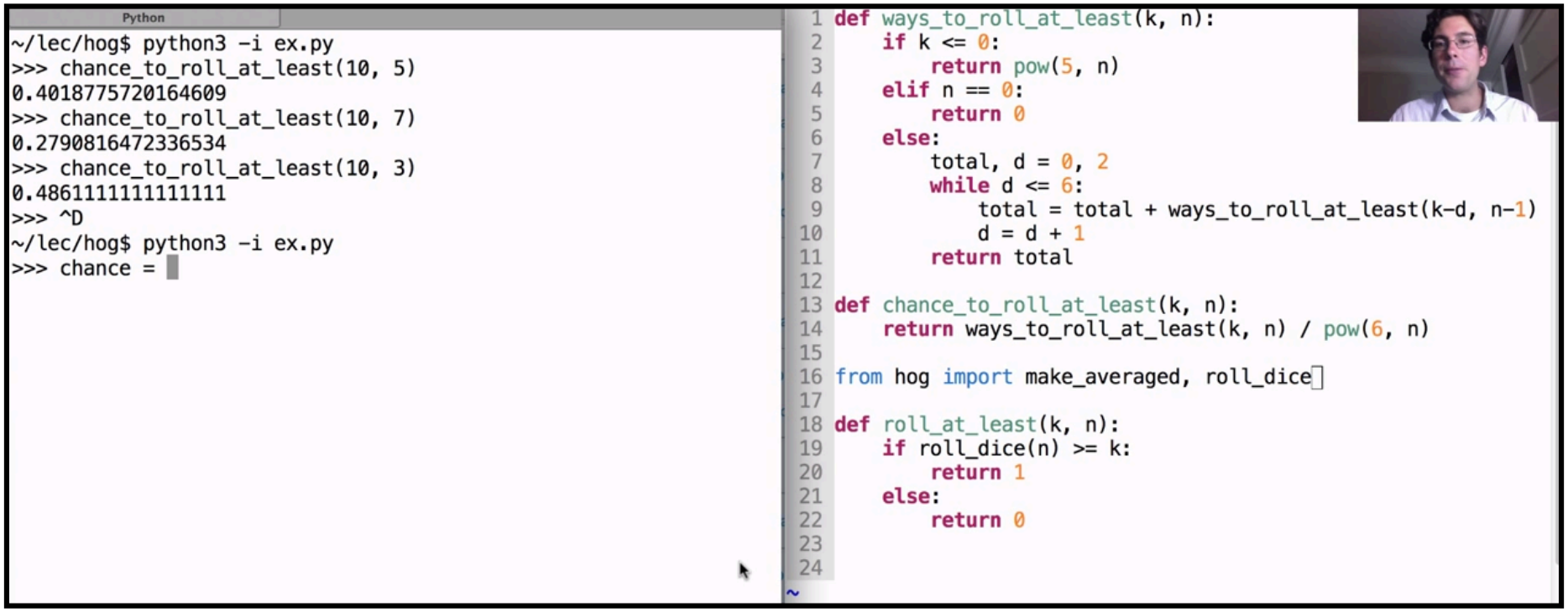

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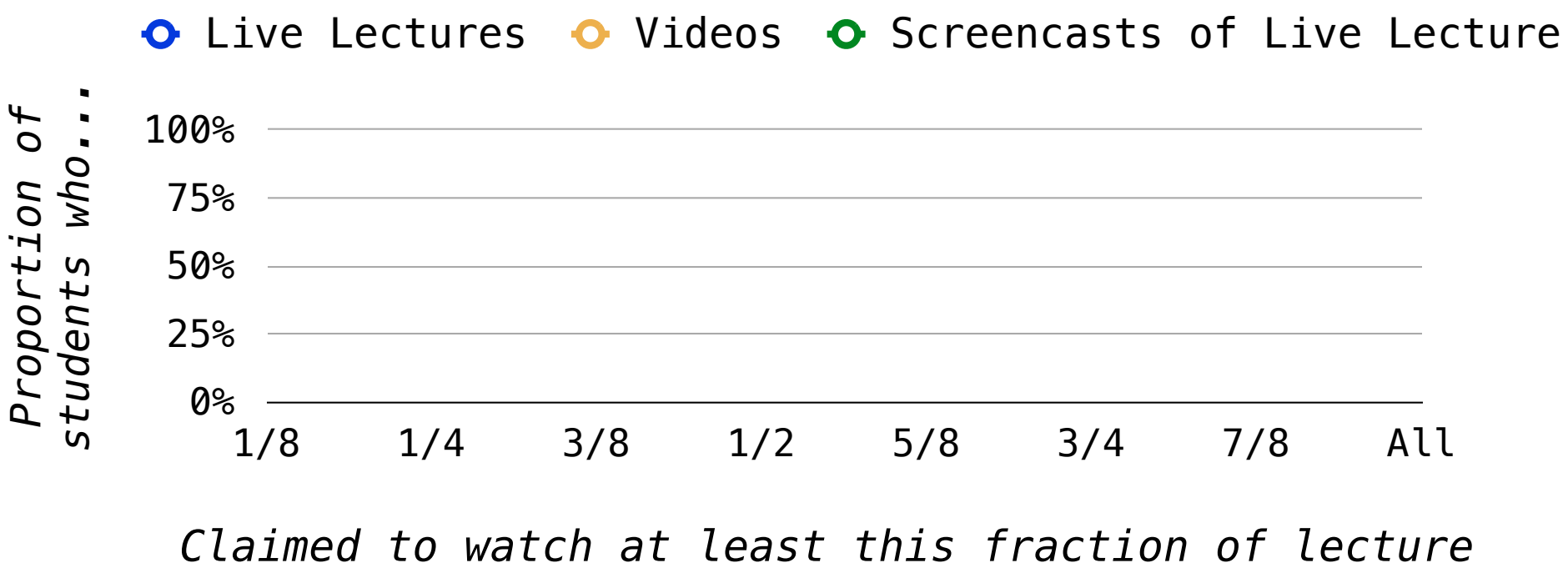

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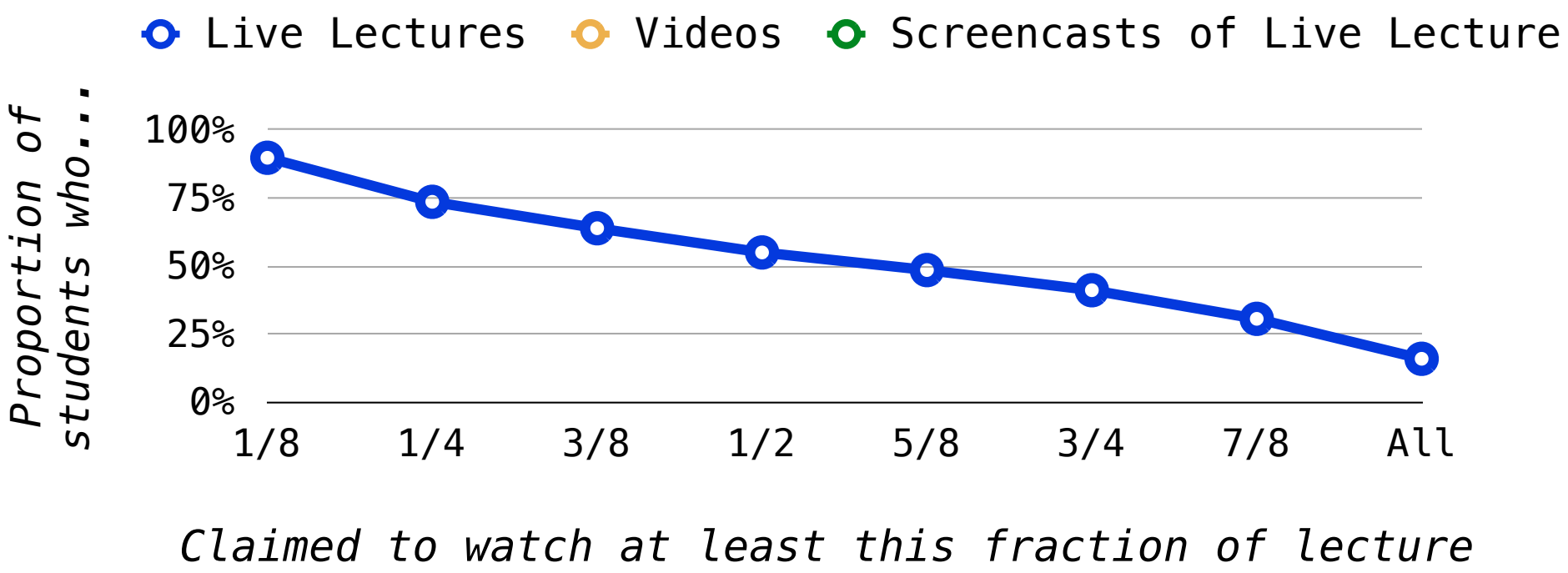

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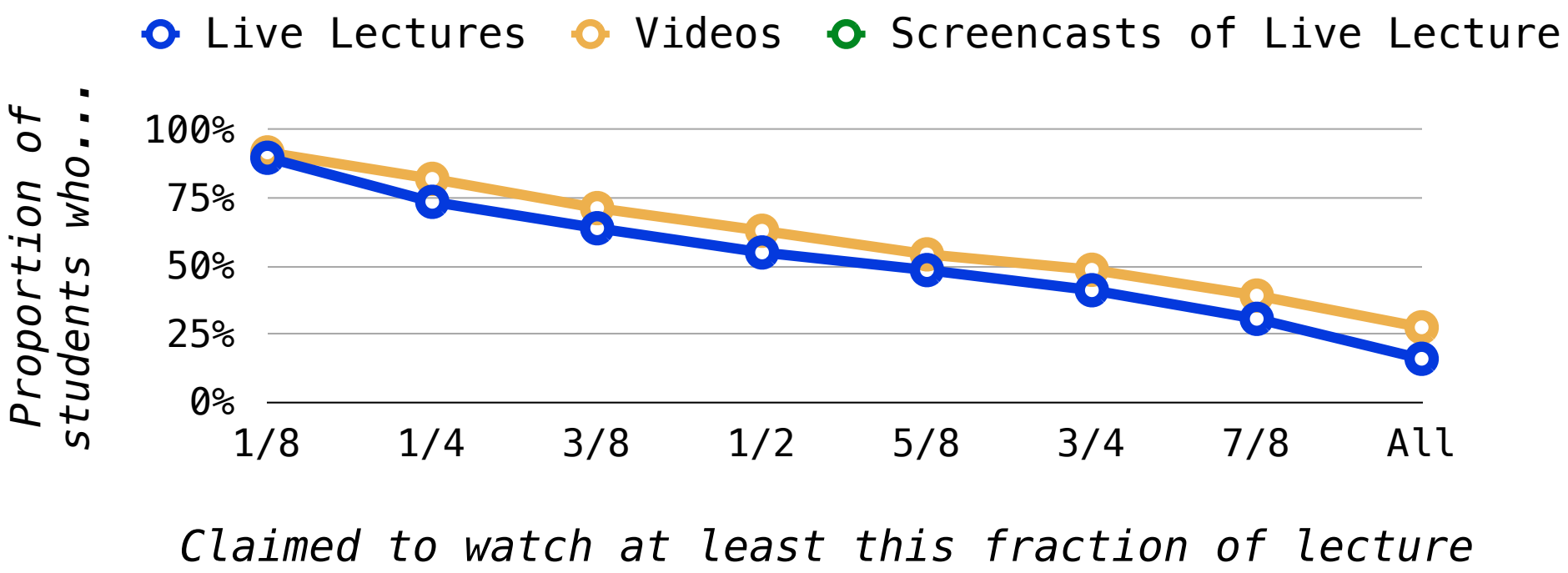

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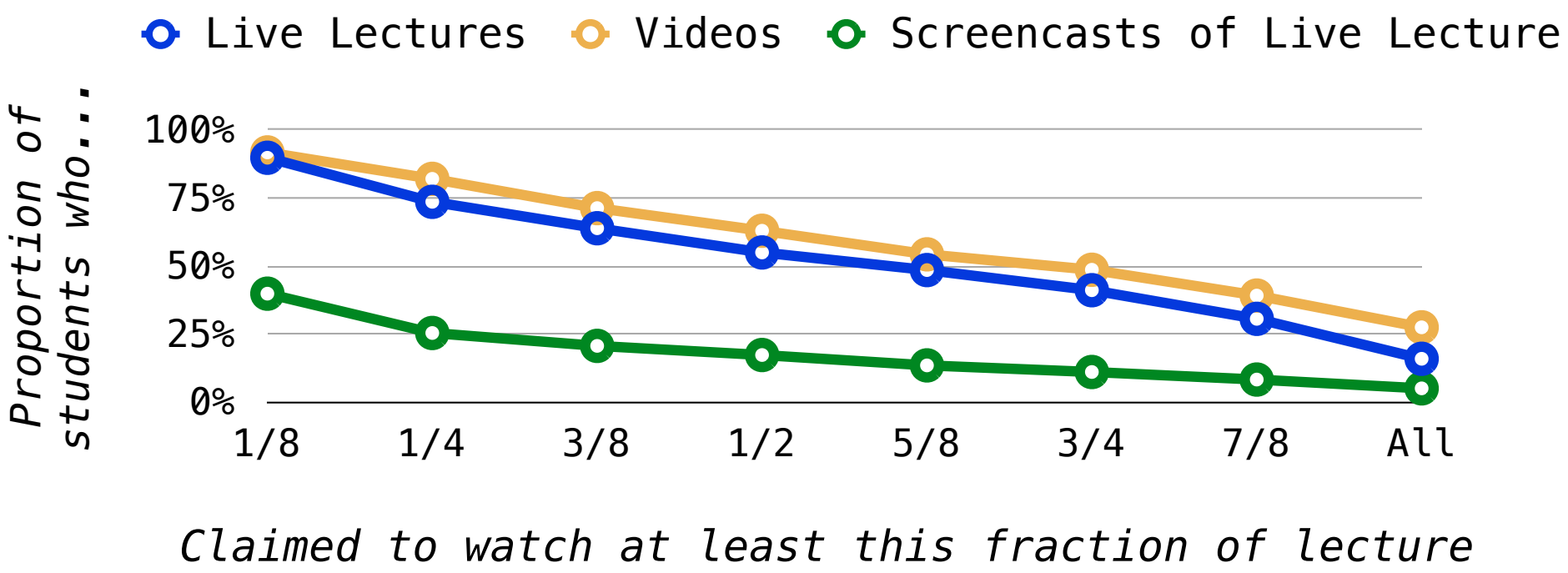

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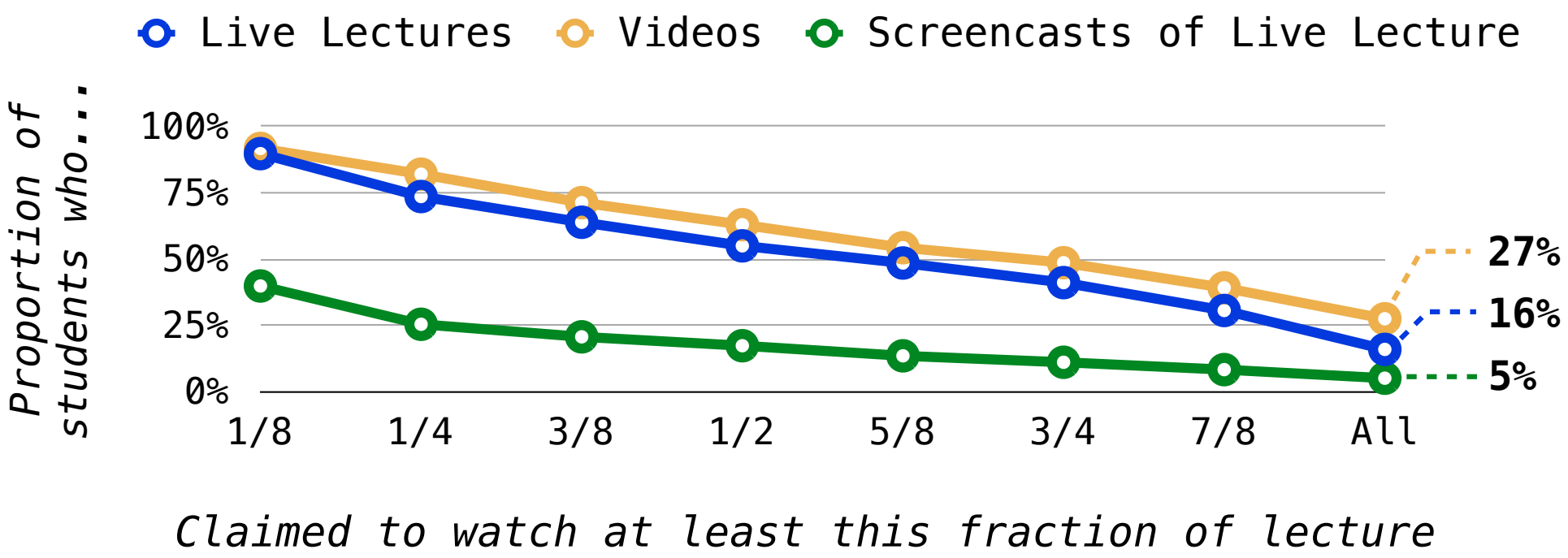

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50              "*** YOUR CODE HERE ***"
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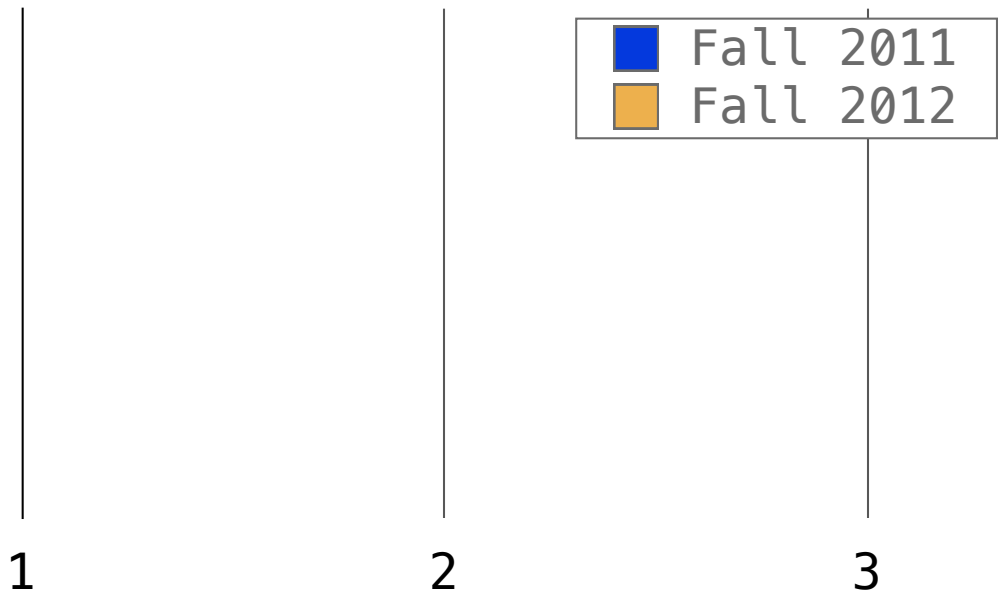
Blind evaluation of a sample of submissions



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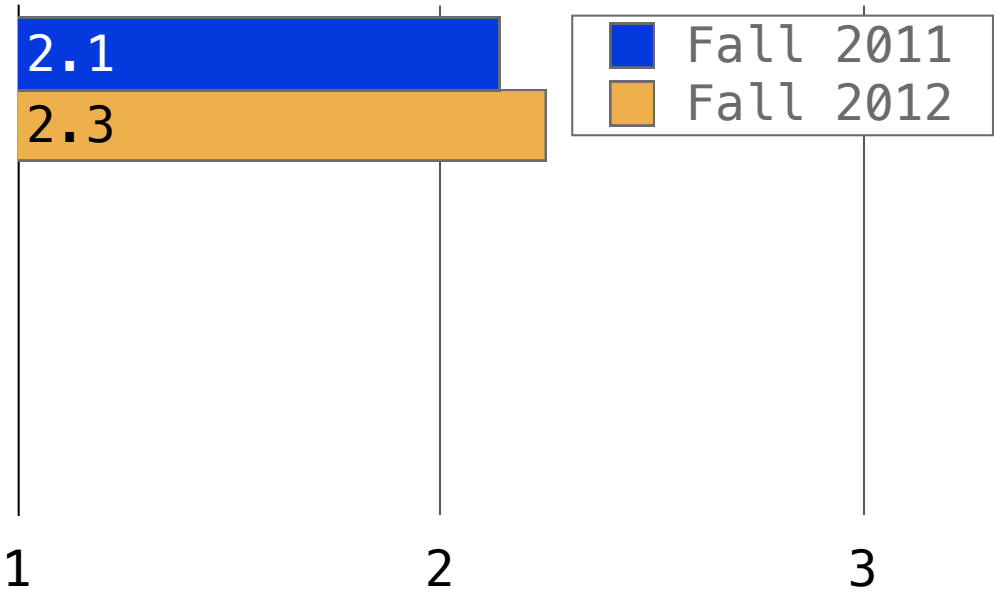

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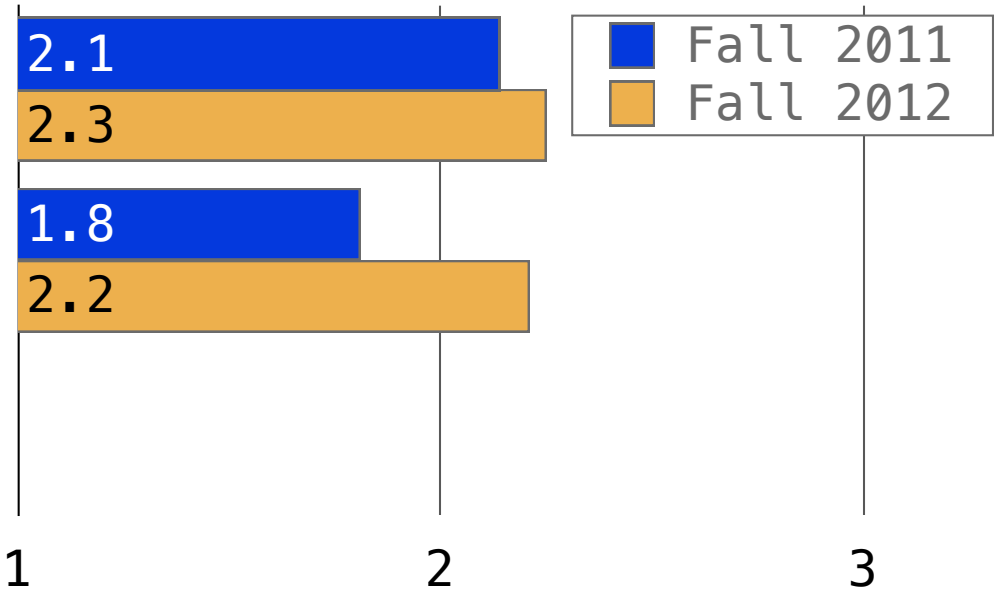
Do names convey the meaning & purpose of their values?

Is the implementation concise?



Online Code Review for Education

CS 61A uses a custom version of Google's (former) code review tool to give feedback about composition.

"Programs must be written for people to read,
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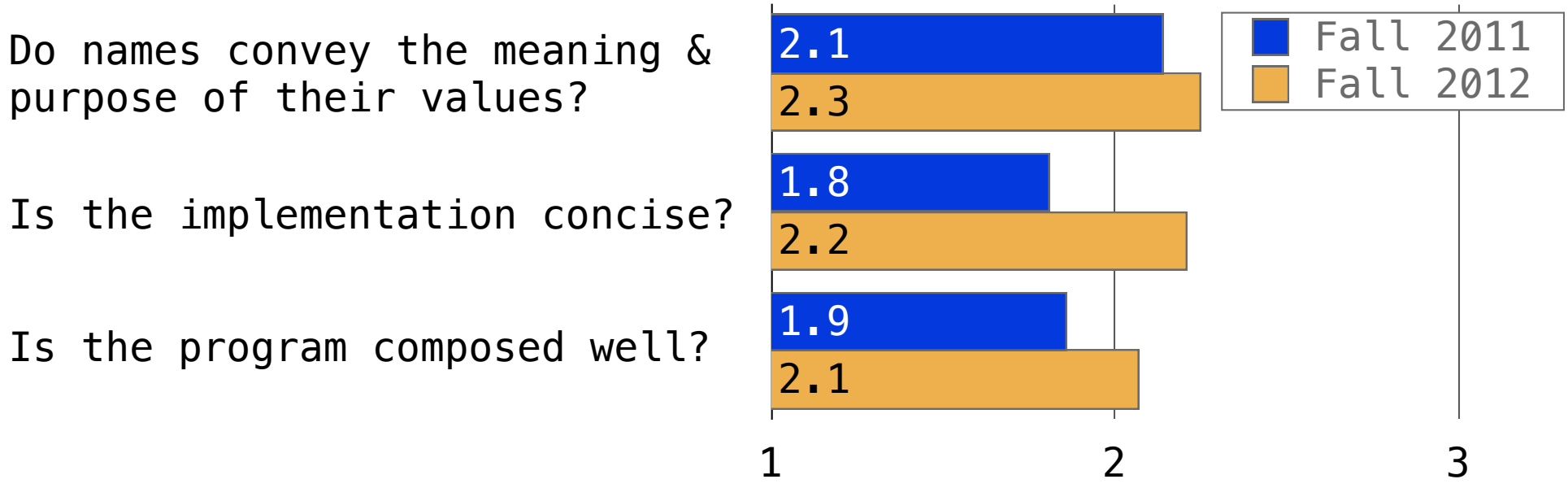
(Structure and Interpretation of Computer Programs)

Blind evaluation of a sample of submissions



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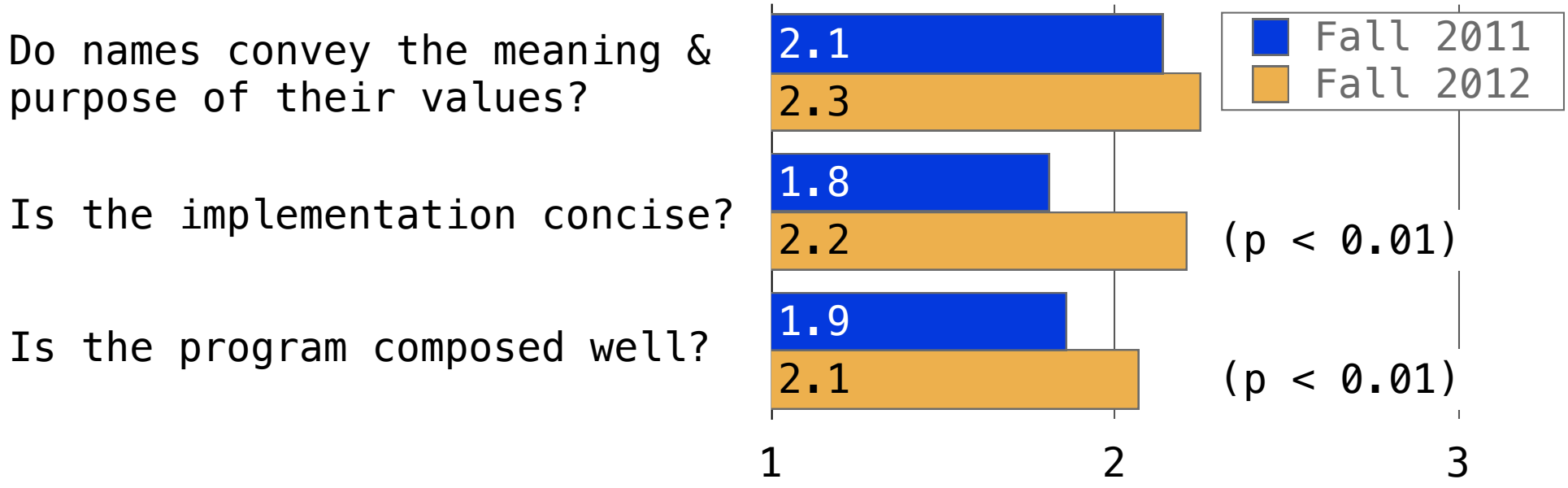

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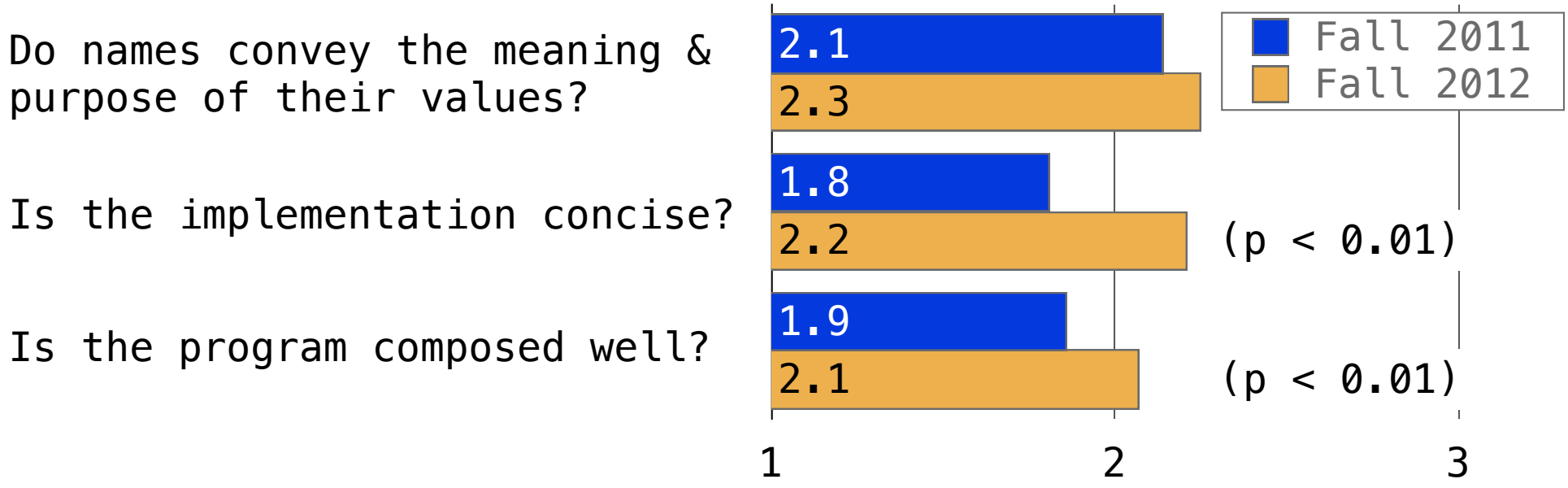

Teaching Composition Quality at Scale, DeNero and Martinis, SIGCSE 2014

Course Trends

Overall Student Experience

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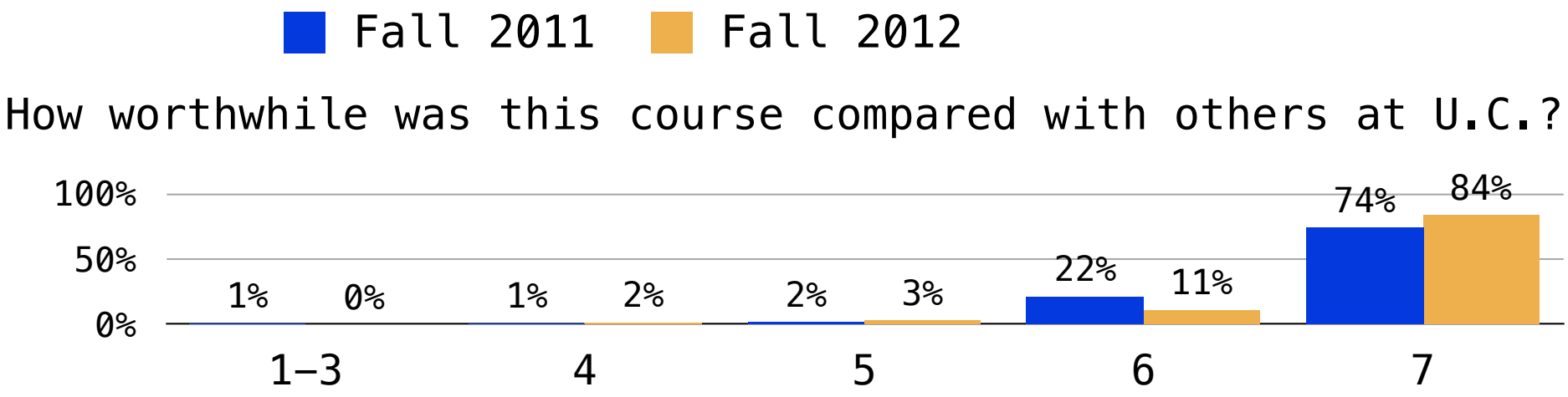

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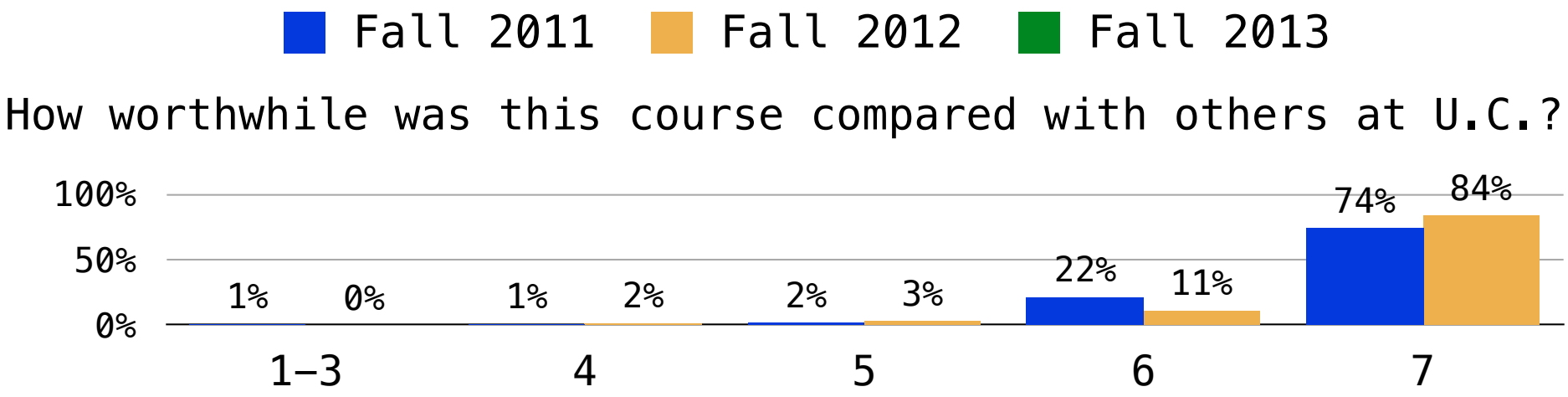
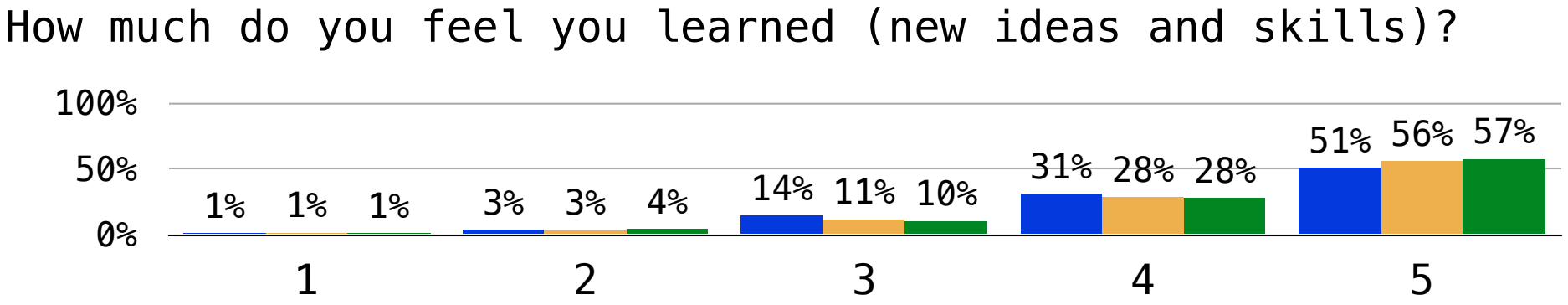
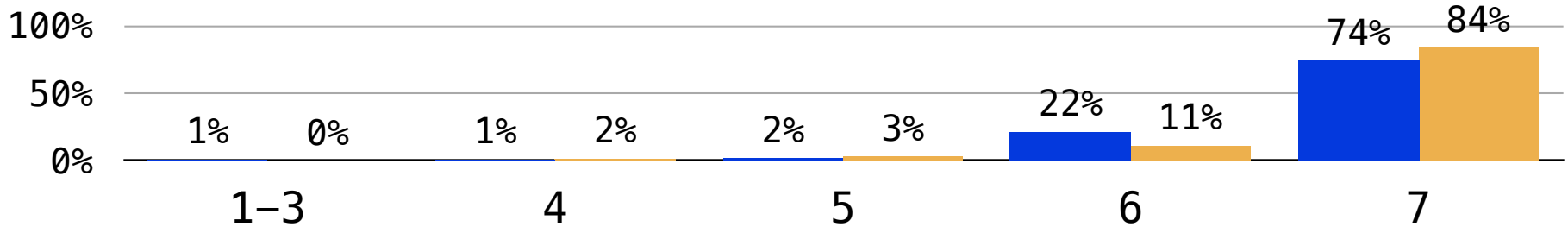




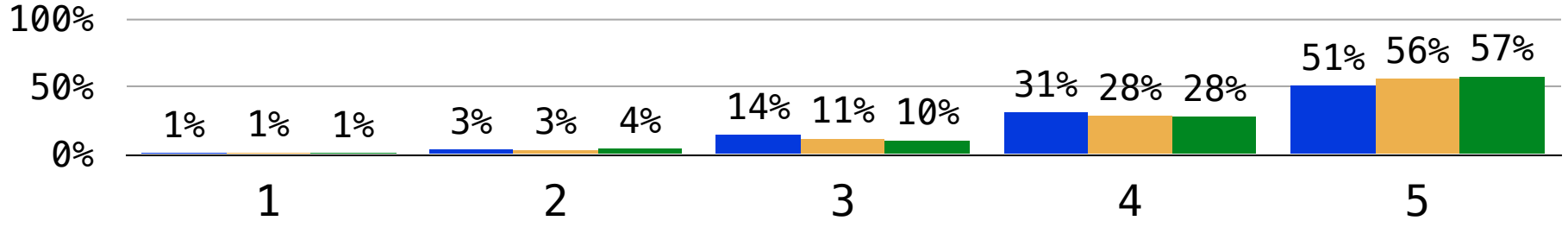
Overall Student Experience

Fall 2011 Fall 2012 Fall 2013

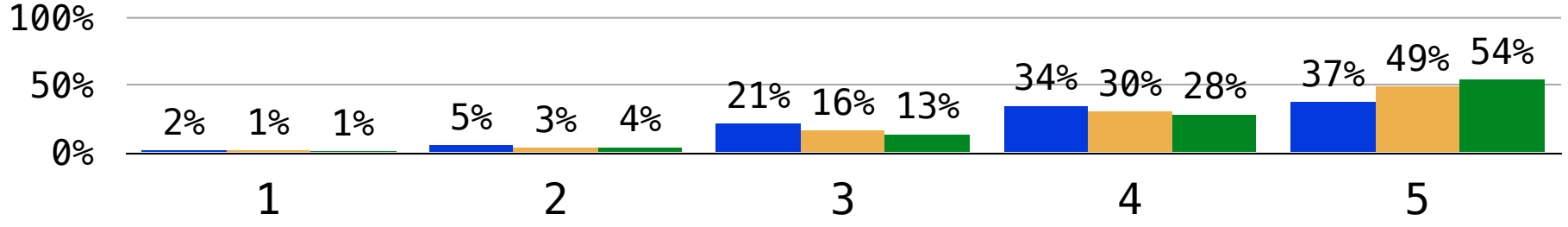
How worthwhile was this course compared with others at U.C.?



How much do you feel you learned (new ideas and skills)?



Relative to your expectations, how much do you feel you learned?



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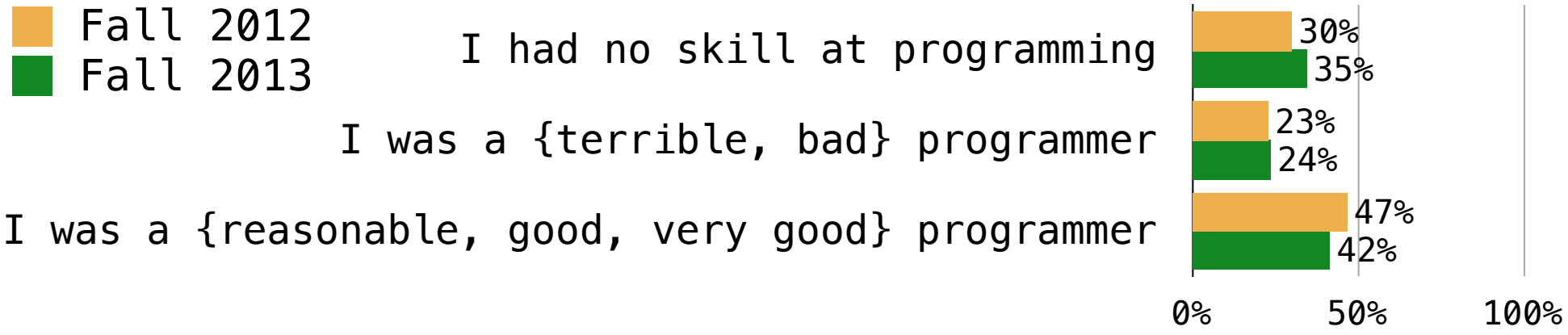

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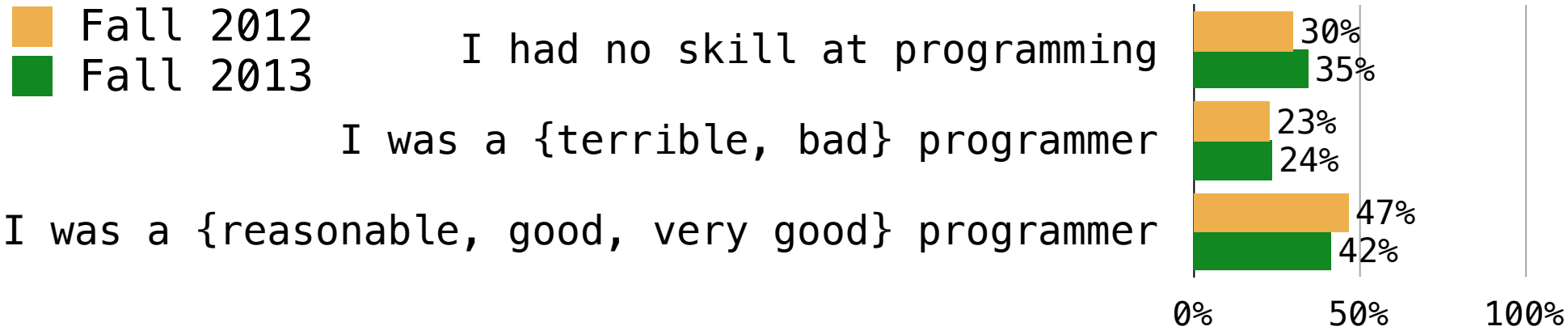

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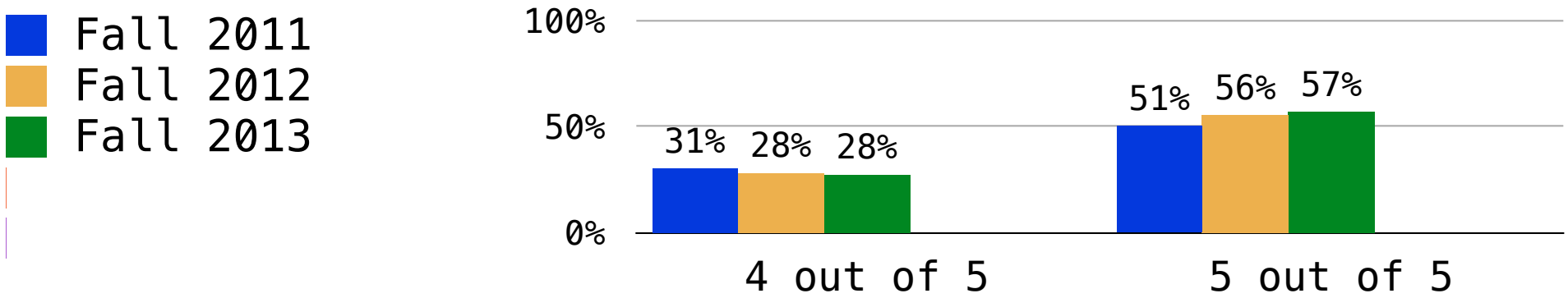

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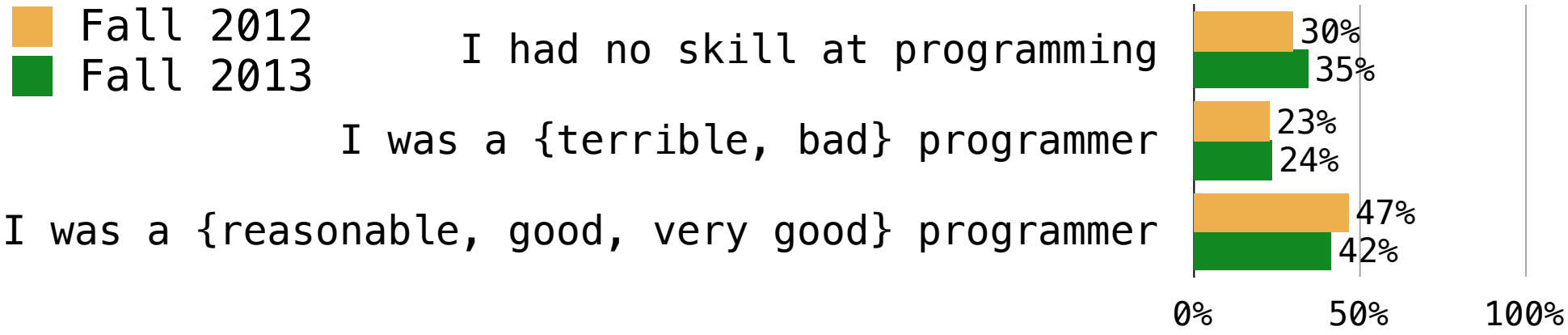

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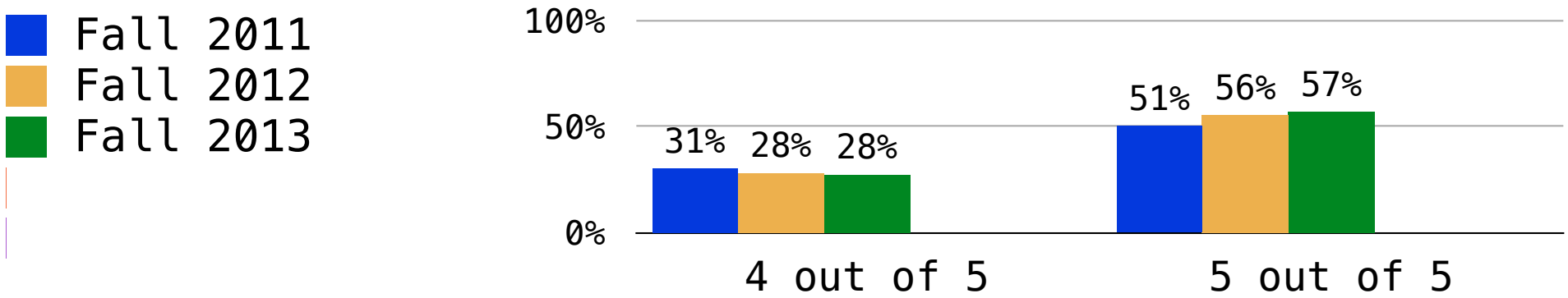

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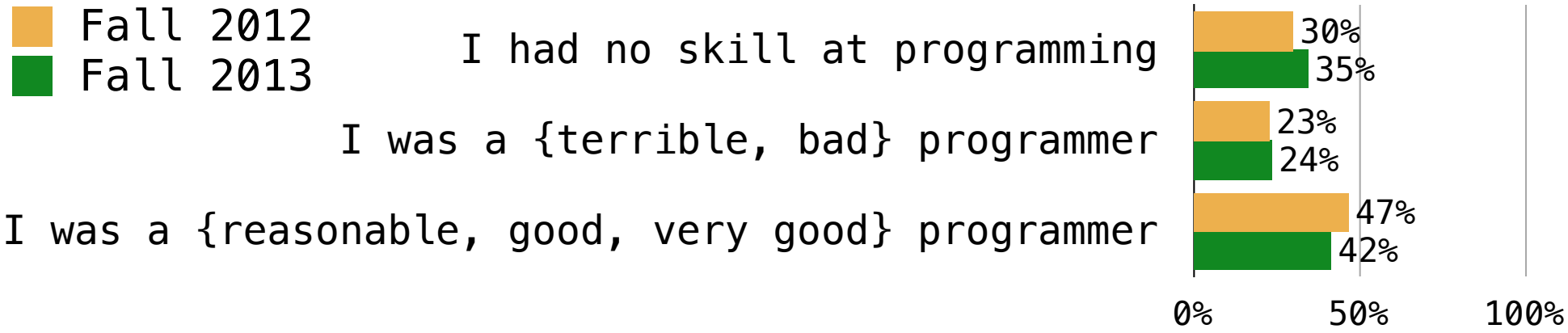

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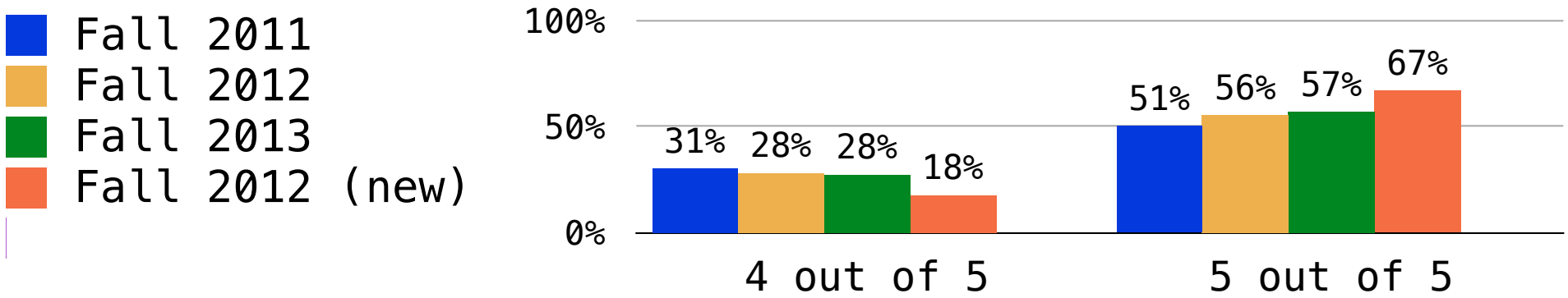

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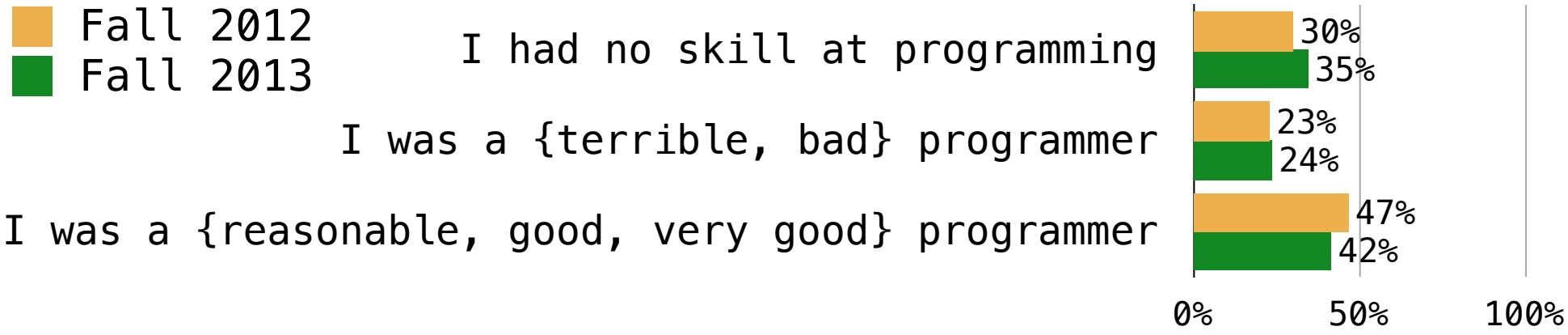

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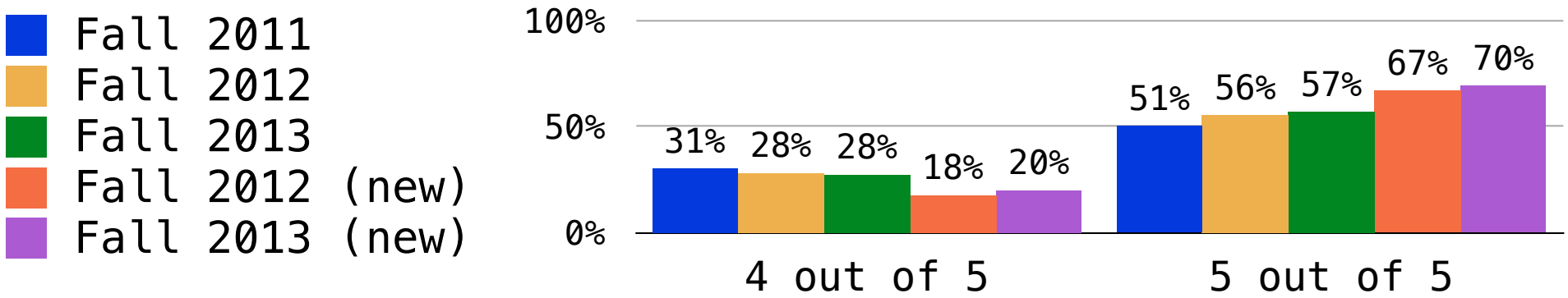

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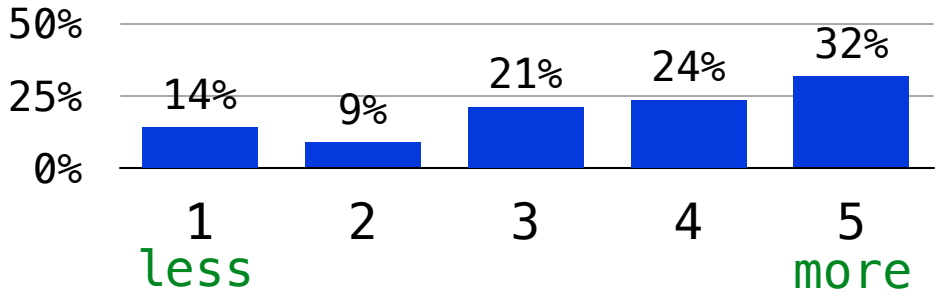

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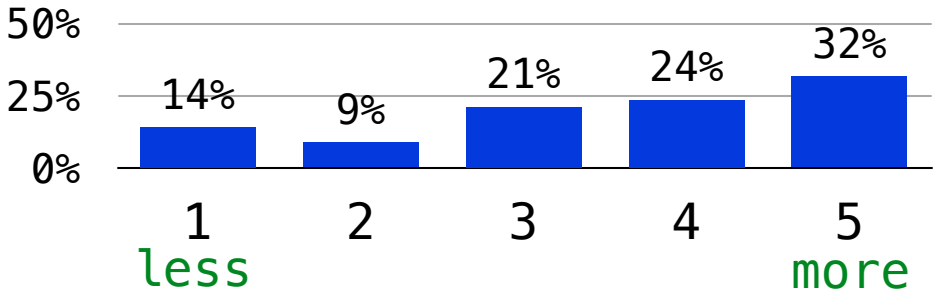

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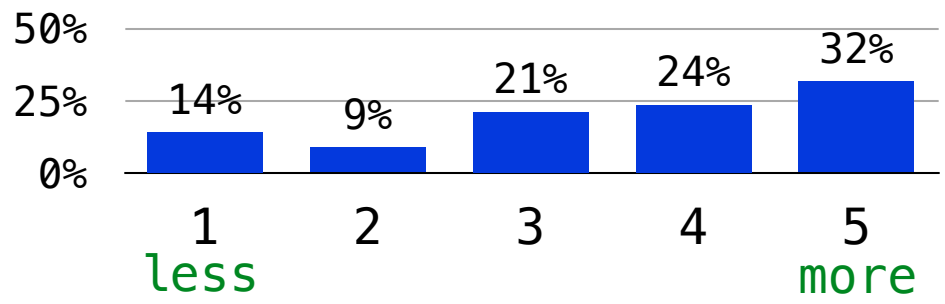

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