

CS21: INTRODUCTION TO COMPUTER SCIENCE

Prof. Mathieson

Fall 2018

Swarthmore College

I will not be on campus tomorrow (Thursday)

Outline Nov 28:

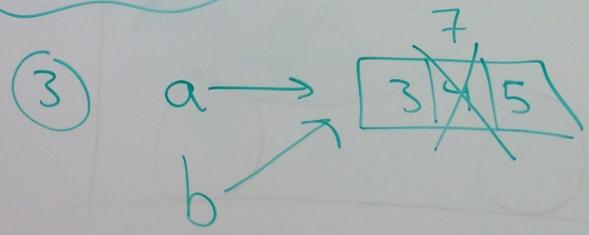
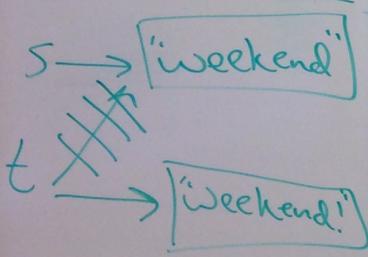
- Go over Quiz 4
- Classes vocab
- Finish: ScreenSaver class
- Start: baseball example (Player and Team classes)
- Examples of methods calling methods

Notes

- Lab 10 due MONDAY
- Quiz 5 this Friday
- Office hours Friday 3-5pm

① data = [[100, 200, 300], [300, 200, 100]]
 0 1 2 0 1 2

data[1][2] : 100
len(data[1]) : 3
300 in data : False



② constructor: 6-11, 16
(Capital)

function: 19, 22
mystery, main

methods: 4, 5, 12, 13, 18, 20
<instance>.method(...)



Quiz 4 common issues

Discuss with a partner

Image 4 ways of creating a snowflake in main. Which of these show abstraction? Which of them show encapsulation?

A

```
snowflake_lines = make_snowflake(click, 50)
for line in snowflake_lines:
    line.draw(win)
```

B

```
flake_halfa = SnowflakeLeft(click, 50)
flake_halfb = SnowflakeRight(click, 50)
flake_halfa.draw(win)
flake_halfb.draw(win)
```

C

```
flake = Snowflake(click, 50)
flake.draw(win)
```

D

```
l1 = Line(Point(x,y+size), Point(x,y-size))
l2 = Line(Point(x+size,y), Point(x-size,y))
l3 = Line(Point(x+size/2,y+size/2), Point(x-size/2,y-size/2))
l4 = Line(Point(x-size/2,y+size/2), Point(x+size/2,y-size/2))
lines = [l1,l2,l3,l4]
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Image 4 ways of creating a snowflake in main. Which of these show abstraction? Which of them show encapsulation?

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 ← Abstract but not encapsulated

C
D Abstract *and* encapsulated →

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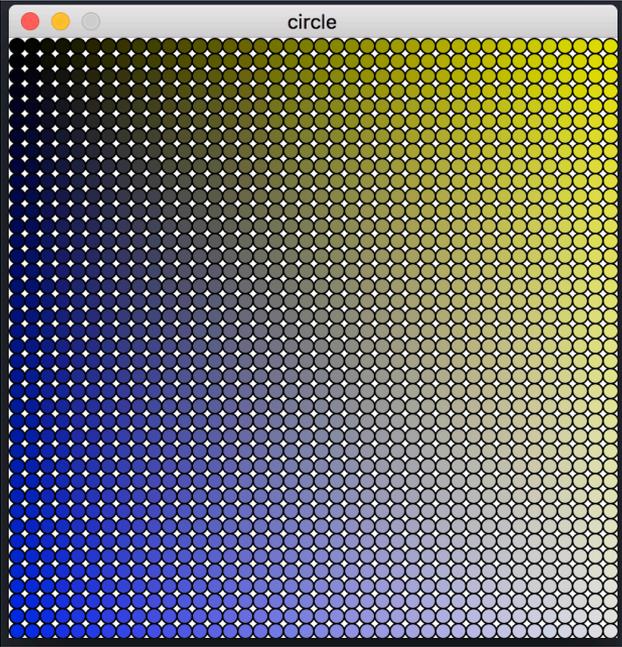
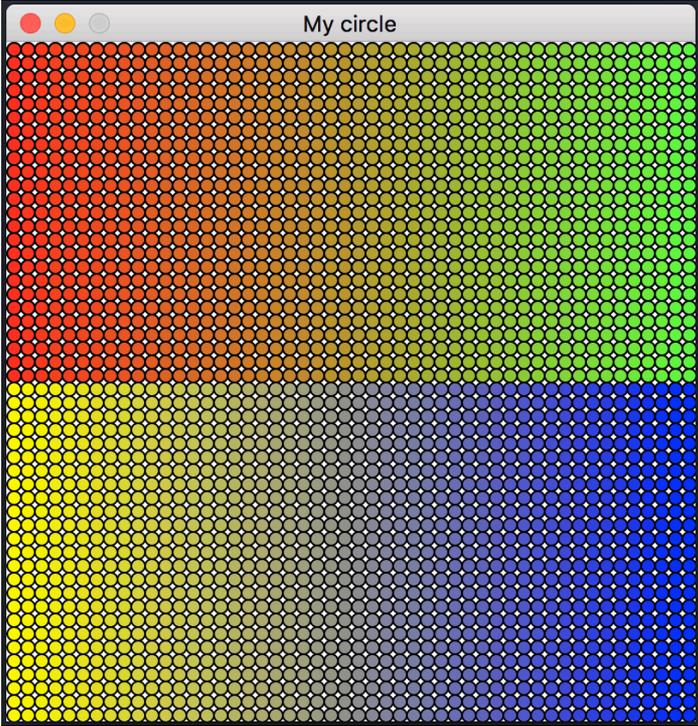
← Neither abstract nor encapsulated

Lab 6 extensions

(selected by graders)

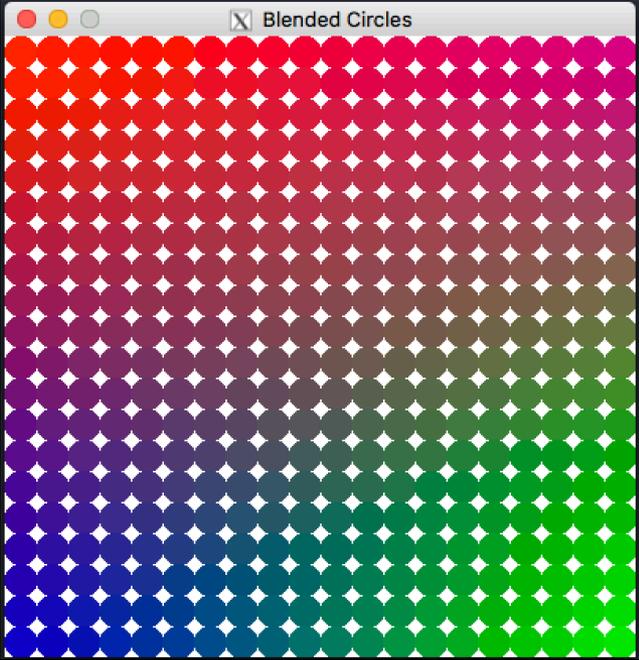
Circle.py

Beluchi

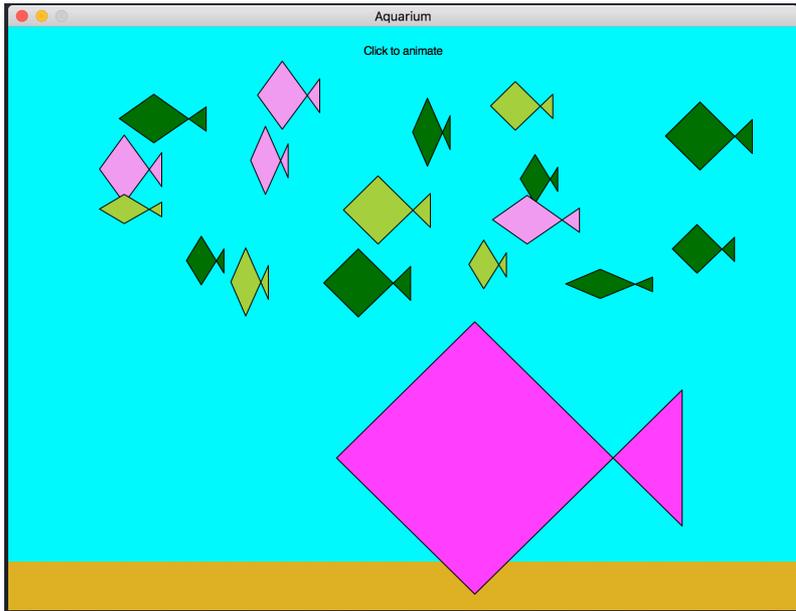


Otis

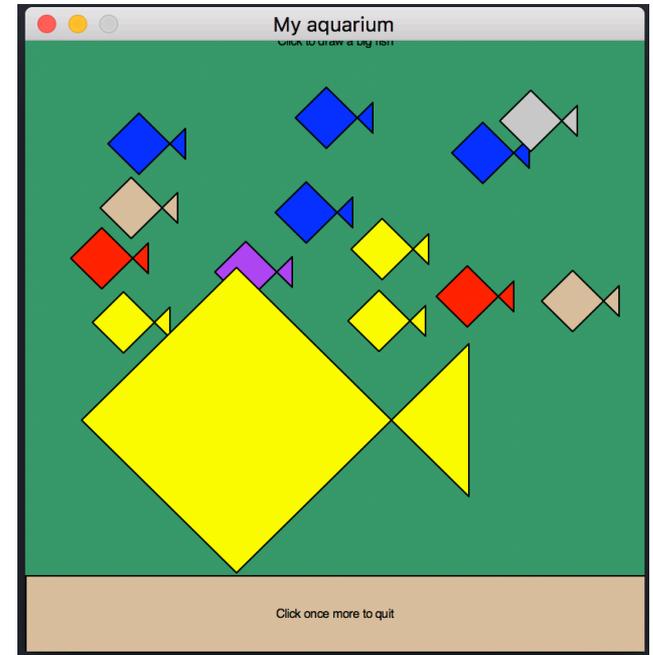
Theo



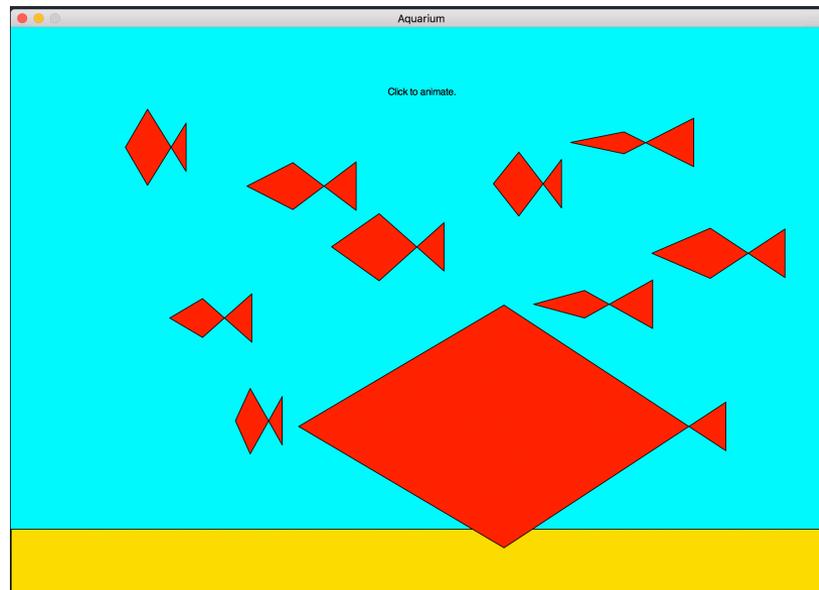
Aquarium.py



Otis



Beluchi

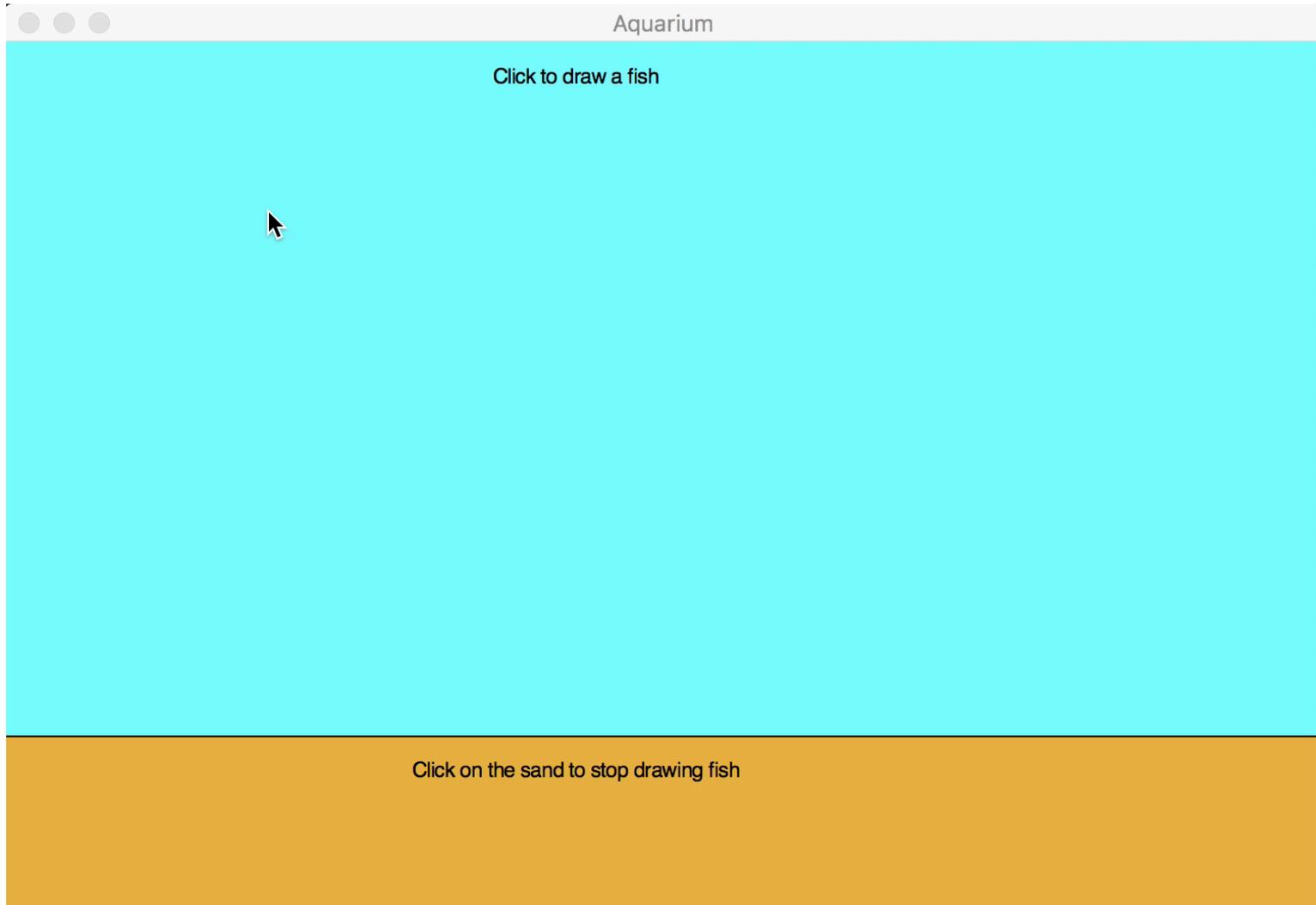


Theo

Julian: fish wrapping



Aron: fish wrapping and bobbing



Screen Saver Example

(images from the Daily Gazette)

swat1.gif



swat2.gif



swat3.gif



Baseball Example

(player lists from Wikipedia)

Challenge: read in the players from a file

red_sox.txt

```
Matt Barnes, Pitcher
Jalen Beeks, Pitcher
Ty Buttrey, Pitcher
Roenis Elías, Pitcher
Heath Hembree, Pitcher
Williams Jerez, Pitcher
Brian Johnson, Pitcher
Joe Kelly, Pitcher
Craig Kimbrel, Pitcher
Austin Maddox, Pitcher
Henry Owens, Pitcher
Drew Pomeranz, Pitcher
Rick Porcello, Pitcher
David Price, Pitcher
Eduardo Rodríguez, Pitcher
Chris Sale, Pitcher
Robby Scott, Pitcher
Chandler Shepherd, Pitcher
Carson Smith, Pitcher
Ben Taylor, Pitcher
Tyler Thornburg, Pitcher
Héctor Velázquez, Pitcher
Brandon Workman, Pitcher
Steven Wright, Pitcher
Sandy León, Catcher
Blake Swihart, Catcher
Christian Vázquez, Catcher
Xander Bogaerts, Infielder
Rafael Devers, Infielder
Marco Hernández, Infielder
Tzu-Wei Lin, Infielder
Deven Marrero, Infielder
Dustin Pedroia, Infielder
Sam Travis, Infielder
Andrew Benintendi, Outfielder
Mookie Betts, Outfielder
Jackie Bradley Jr., Outfielder
Bryce Brentz, Outfielder
Brock Holt, Outfielder
Hanley Ramírez, Designated hitter
```

yankees.txt

```
Albert Abreu, Pitcher
Domingo Acevedo, Pitcher
Dellin Betances, Pitcher
Luis Cessa, Pitcher
Aroldis Chapman, Pitcher
Giovanny Gallegos, Pitcher
Domingo Germán, Pitcher
Sonny Gray, Pitcher
Chad Green, Pitcher
Ben Heller, Pitcher
Jonathan Holder, Pitcher
Tommy Kahnle, Pitcher
Jonathan Loáisiga, Pitcher
Bryan Mitchell, Pitcher
Jordan Montgomery, Pitcher
David Robertson, Pitcher
Luis Severino, Pitcher
Chasen Shreve, Pitcher
Masahiro Tanaka, Pitcher
Adam Warren, Pitcher
Kyle Higashioka, Catcher
Austin Romine, Catcher
Gary Sánchez, Catcher
Miguel Andújar, Infielder
Tyler Austin, Infielder
Greg Bird, Infielder
Starlin Castro, Infielder
Thairo Estrada, Infielder
Didi Gregorius, Infielder
Chase Headley, Infielder
Gleyber Torres, Infielder
Ronald Torreyes, Infielder
Tyler Wade, Infielder
Jake Cave, Outfielder
Jacoby Ellsbury, Outfielder
Clint Frazier, Outfielder
Brett Gardner, Outfielder
Aaron Hicks, Outfielder
Aaron Judge, Outfielder
Billy McKinney, Outfielder
```