

CS21: INTRODUCTION TO COMPUTER SCIENCE

Prof. Mathieson

Fall 2017

Swarthmore College

Outline Nov 20:

- Faster than $O(n^2)$ sorting
- Begin: writing our own classes
- Pie class example
- Student class example

Notes

- Lab 9 due Monday after Thanksgiving
- Office hours: 3-5pm **Tuesday** (for this week)
- There is lab this week! (Tues/Wed)
- **Ninja sessions**: Tues this week, Sunday after Thanksgiving

Classes

So far with classes...

- We have already seen existing classes (**Point**, **Circle**, **Line**, etc)

So far with classes...

- We have already seen existing classes (**Point**, **Circle**, **Line**, etc)
- Classes allow us to encapsulate common data structures and actions so we don't have to define them over and over again

So far with classes...

- We have already seen existing classes (**Point**, **Circle**, **Line**, etc)
- Classes allow us to encapsulate common data structures and actions so we don't have to define them over and over again
- We can create a new instance of a class using the *constructor*

```
dot = Circle(Point(x,y),r)
```

So far with classes...

- We have already seen existing classes (**Point**, **Circle**, **Line**, etc)
- Classes allow us to encapsulate common data structures and actions so we don't have to define them over and over again
- We can create a new instance of a class using the *constructor*

```
dot = Circle(Point(x,y), r)
```

- We can access the instance's data using *methods*

```
r = dot.getRadius()
```

So far with classes...

- We have already seen existing classes (**Point**, **Circle**, **Line**, etc)
- Classes allow us to encapsulate common data structures and actions so we don't have to define them over and over again
- We can create a new instance of a class using the *constructor*

```
dot = Circle(Point(x,y), r)
```

- We can access the instance's data using *methods*

```
r = dot.getRadius()
```

- We can use/modify class instances using *methods*

```
dot.move(dx, dy)
```

Motivation for classes: LOLs

- List-of-lists let us keep track of things that should be “together”, but they get cumbersome to modify:

```
>>> pie_lst = ["apple",8], ["cherry",8], ["chocolate",8]
>>>
>>> pie_lst[2][1] -= 1
>>>
>>> pie_lst
[['apple', 8], ['cherry', 8], ['chocolate', 7]]
```