

Classes and Pygame pt 1

Dr. Baldassano

chrisb@princeton.edu

Yu's Elite Education

Last week recap

- ▶ Random Numbers
 - ▶ Pseudorandom vs true random
 - ▶ Generating random ints and floats
- ▶ Files
 - ▶ Input files
 - ▶ Output files

Homework: Table of Contents

- ▶ Download Alice in Wonderland text file from the course website
- ▶ Write a TableOfContents.txt file with all the chapter names from the book

Python types

- ▶ We've seen a bunch of types:
 - ▶ int, float, string list
- ▶ Each type has its own functions and operations
 - ▶ `mylist.sort()`
 - ▶ `mylist1 + mylist2`
 - ▶ `mystring_cap = mystring.capitalize()`

Making new types

- ▶ What if we're making a game, and want to have a bunch of spaceships?
- ▶ May have lots of spaceships, and want to keep track of information and functions for each one
- ▶ Could try to do something with lists and functions
- ▶ Better solution: create a new “shapeship” type!

Classes

- ▶ User-defined types are called classes
- ▶ A class is a “template” for making objects
- ▶ Classes specify two kinds of things:
 - ▶ Attributes: variables that every instance of a class has
 - ▶ Methods: functions that I can call on instances of this class
- ▶ Robot example

Initializing classes

- ▶ We can make a function that performs actions right when an instance of this class gets created
- ▶ Can pass arguments to this initialization function

Inheritance

- ▶ We can use an existing class as a starting point for a new class
- ▶ This new “child” class has all the functions and attributes of its “parent” class, plus some new ones
- ▶ Might also override some functions of its parent
- ▶ Called “inheritance”

Object-Oriented Programming

- ▶ Making a class for every piece of a program is called “Object Oriented Programming” (OOP)
- ▶ Has become popular since:
 - ▶ Keeps unrelated parts of the program separate (“encapsulation”)
 - ▶ We can build on existing classes (inheritance)

PyGame

- ▶ A set of python modules for making (simple) games
- ▶ Gives us a bunch of functions for drawing things to the screen and responding to keyboard and mouse input

Drawing graphics

- ▶ To prevent flickering, we draw things in two steps:
 1. We copy images onto parts of the screen, using the “blit” function
 2. We “flip” the display, replacing what the user is seeing with our new screen
- ▶ Let's set it up!