From Pixels to Games

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Pixels

• The only manner of creating a Picture is to do so at the pixel level
• You can make a library of Photoshop-like functions by just setting the pixels of a Picture based on another Picture
• Everything on the computer is created by altering pixels (desktop, cell phone displays, etc)
• In real time, one can do this same thing for TV weather forecasting (bluescreen, greenscreen)
• Animations are made by showing slightly different Pictures in quick succession
Photoshop Examples

- Flip (horizontal or vertical)
- Rotate 90, -90
- Scale (larger or smaller)
- Blur or sharpen
- Copy/paste
- Brighten or lighten
- Colorize, color altering (eg, redeye removal)
Other Uses

- Greenscreen, bluescreen
- Stereographs
- Animations
- Image Processing
- Football
- Visualizations
def copy(pic1):
    pic2 = makePicture(getWidth(pic1), getHeight(pic1))
    for pixel in getPixels(pic1):
        setPixel(pic2, getX(pixel), getY(pixel), getColor(pixel))
    return pic2
Objects

• Why?

• Terms:
  • Object
  • Class
  • Instance
  • Property
  • Method
What if you wanted to control two or more robots?
How do we currently control a robot?

- forward(1, .5)
- turnLeft(.7, 2)

How could we indicate which robot we want to move?
One possible way of controlling more than one robot:

```python
robot1 = Robot("Garth")
robot2 = Robot("Miley")

forward(robot1, 1, .5)
turnLeft(robot2, .7, 1.2)
```
forward() would have to know about many different kinds of Robots
Introducing “Objects”

- Objects are “things” (often nouns) in computing
- They know how to do things (verbs) and have attributes (properties)
- We can refer to properties and tell objects to do things by using the DOT (period):
  - garth.turnLeft(1, 2)
  - jane.turnLeft(1, 3)
  - robot1.name
- Verbs are just functions, but we call them “methods”