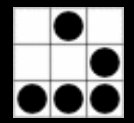
Get ready



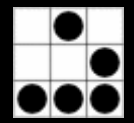
- Tells us your coding experience
- Ask organizer where to sit
- Get latest version of “development” folder
- Run block.py
- Help others to run block.py

Hack the code. Share cool results.

Making Games with Minecraft API

Making Games with Minecraft API

What you will learn



The right attitude

- Concepts
  - APIs, libraries,
- Techniques
  - How to search for help
- Technologies
  - Python, Minecraft API

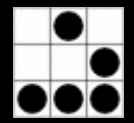
The right attitude

Be playful

Be curious

Try things

If you only learn one thing…

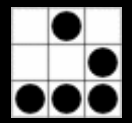


Just try it

How we learn to code

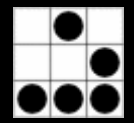
The real story…

Learning code



- Set a goal
- Copy-and-paste
- Tinker
- Share and teach

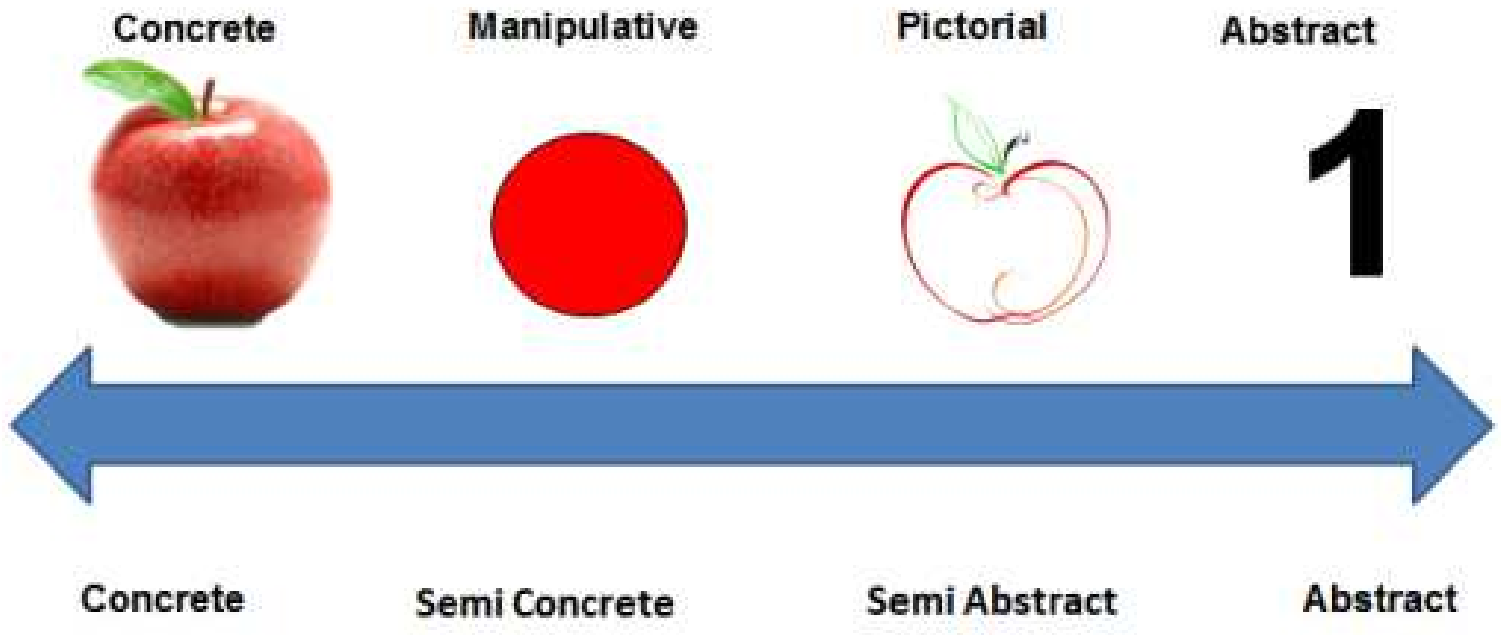
Have an awesome goal!



Dream
Idea
Hack
Stunt
Prank

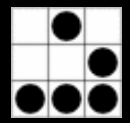
With a goal…

Abstract concepts become concrete and easy to understand



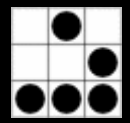
Copy-and-paste

You will learn the patterns



It will slowly make more sense
Until it becomes natural to you

Tinker



Change things

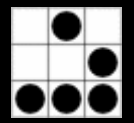
See what happens

Learn through doing

You can only learn how to play an instrument

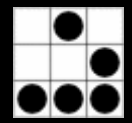
Through actual practice

Honor your teachers



Those who teach, write books, write clear code, share their code, answer your questions

Coding is a tribal activity



Be kind

Be patient

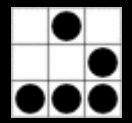
Help beginners

Teach others

Hacking

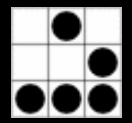
How we are going to spend the rest of the session

The format



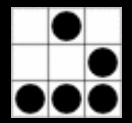
- We set up a goal
- We hack towards it
- We share
- I will quickly teach some concepts

The style



- This is going to be fast paced
- Ask me questions
- Ask your buddy questions

It is OK to feel confused

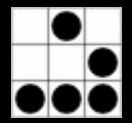


- If your code works, you are fine
- You will understand more with practice

Begin

Create our own mob

A mob needs to

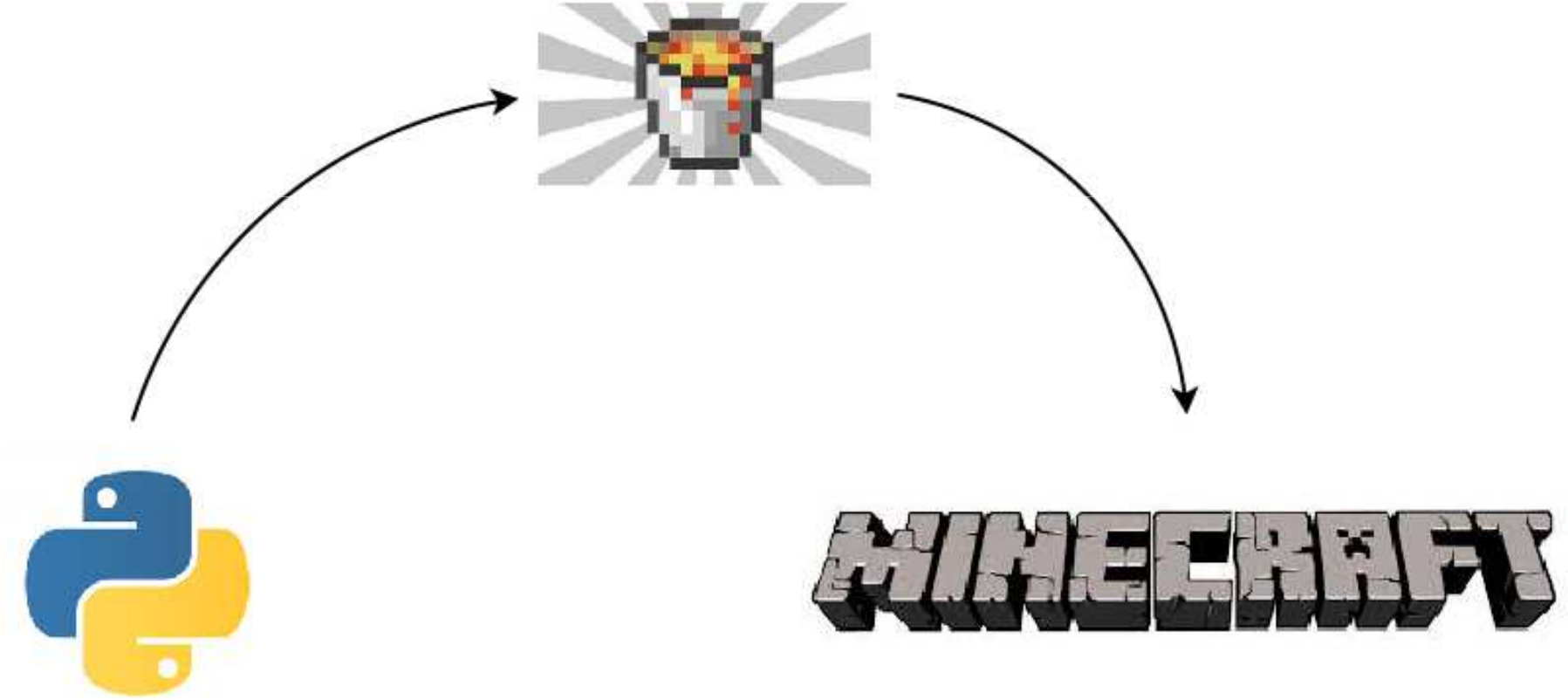


- Have a body
- Move
- Find the player
- Follow the player
- Tag player by sending him away

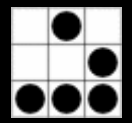
The programming environment

The tools that you need

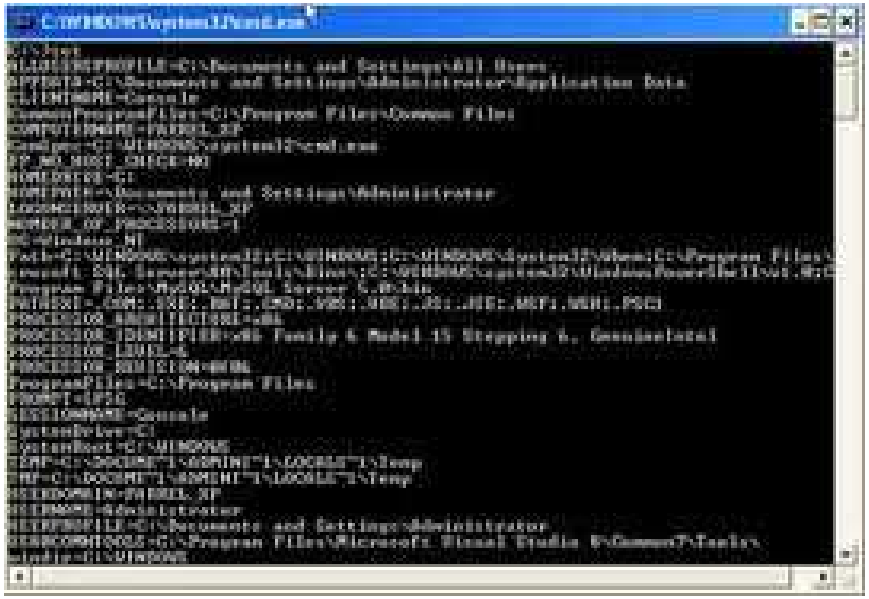
Python, Bukkit & Minecraft



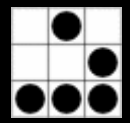
Tools



- Text editor
- Command line

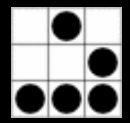


Input and Output



- Input: We talk to the computer
- Output: The computer talks to us

Challenge

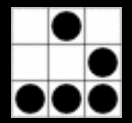


- Tinker with code of block.py
- Change spelling
- Erase lines

Errors and Googling

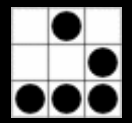
Block.py

Reading error messages



- Read the error
- You won't understand all
- Look for file name and line
- If stumped, google the error message

How to google

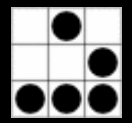


Type the technology followed with one or two words:

python sleep

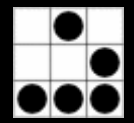
Python error message

Who to trust?



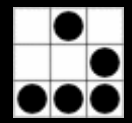
- python.org
- stackoverflow
- programmer blogs (they have a special look)

Sites to avoid



- Those with many pop ups
- Those encouraging to click on flashy links
- Those asking you to download programs

Challenge

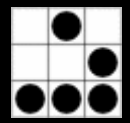


- Tinker more with the code
- Type # in front of lines and see what happens

Computers, libraries, and APIs

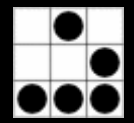
Block.py

Reading Code



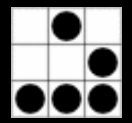
- Library calls
- Assignments
- Method calling
- Comments

Computers are dumb



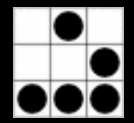
- It only know what you teach them
- Each command is a word
- Only know words if you tell them

Libraries



- A dictionary of words that a computer can understand
- It is also commonly called a module

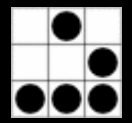
API



- Application Programming Interface
- A description of the library
- Library implements the API
- When you hear API, think library*

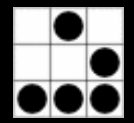
* Most of the time

Exploring the library



- Exploring the library
- Exploring the API
- Examine block.py

Challenge

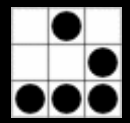


Create a column

Coordinates and loops

colum.py

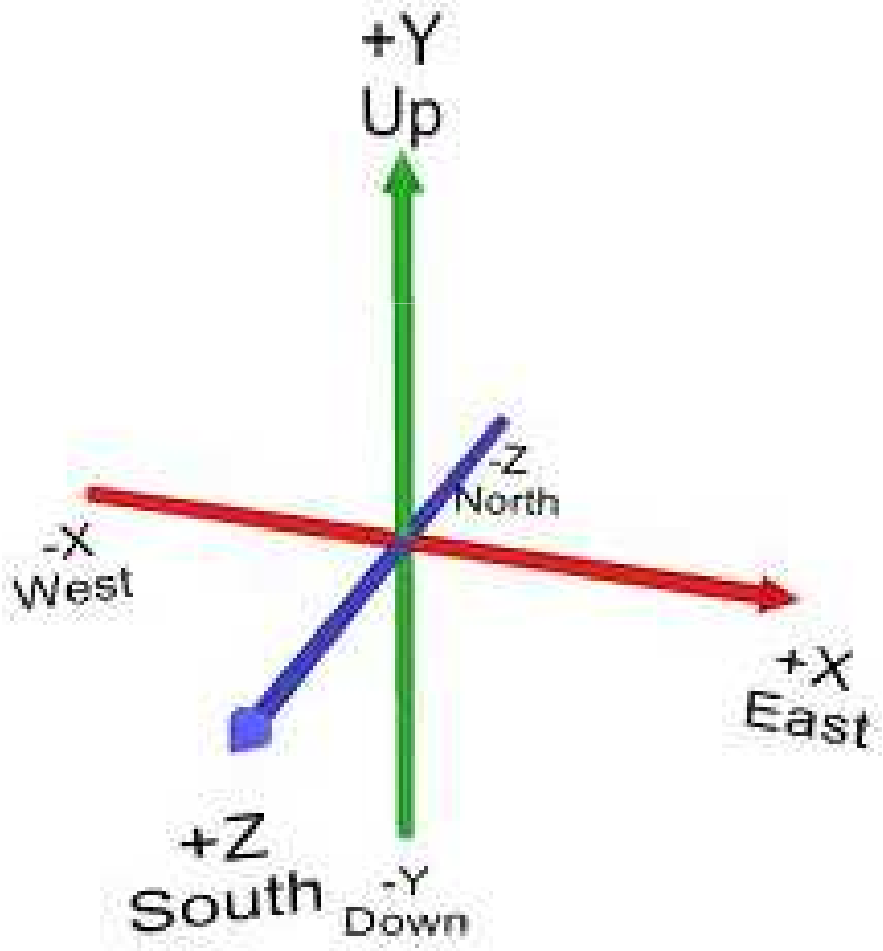
Code Reading



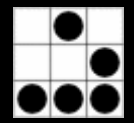
- Simple assignment
- Variables instead of literals

The minecraft coordinates

X and Z on the plane
Y up and down



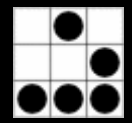
for loop



```
for variable_name in list:
    one statement
    another statement
    another statement
```

- the list can be a method
- white space == block
- variable_name visible in the block

Challenge



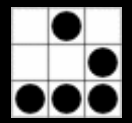
Make the column move

Moving our mob

Breaking tasks down and writing methods

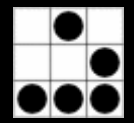
moving.py

Code reading

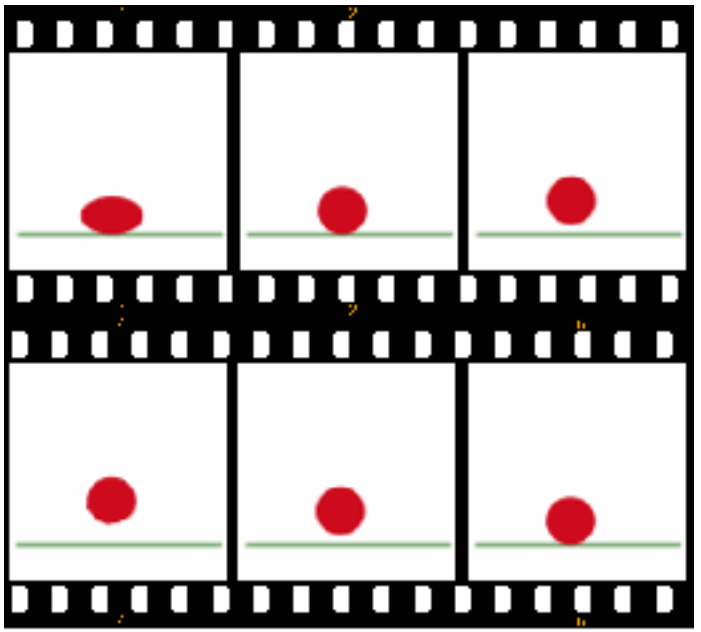


- def blocks. These are methods
- sleep()
- postToChat()

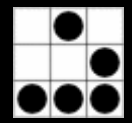
What is movement?



- We erase or *clear* the old blocks
- We *update* the coordinates to a new place
- We *draw* the column in the new coordinates



Methods

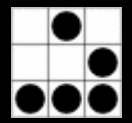


- Methods are action words
- Also called procedures, subroutines, or functions
- They are a named block of code

Tip: Use verb when naming methods

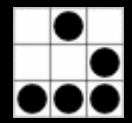
Methods, the Holy Grail

Methods in python



```
def name(argument):
        block
        block
        return result #optional
```

Challenge

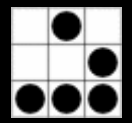


- Make the code easier to understand

Objects

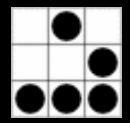
Organizing your code and variables into nice little packages
movingWithObjects.py

Reading Code



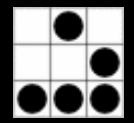
- There is a class
- We are using our own object

Objects



- They are like a neat organizing box
  - They collect words
  - They collect variables
  - It is like a template, like a rubber stamp
  - The template is called a “class”

Class in Python

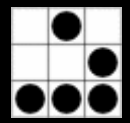


```
class Name():
    def __init__(self, height):
        self.height = height

    def draw(self):
        self.render()
```

- init is the constructor
- self refers to the object itself

Challenge

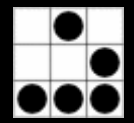


- Teach your mob how to see you

Giving sight

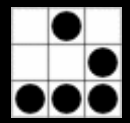
Scanning and hacking an object
scanning.py and mob.py

Code reading



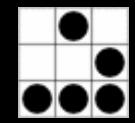
- scanning.py
  - It is easier to read
  - We are importing the mob code
- mob.py
  - New scan() method
  - New within_range() method

Seeing

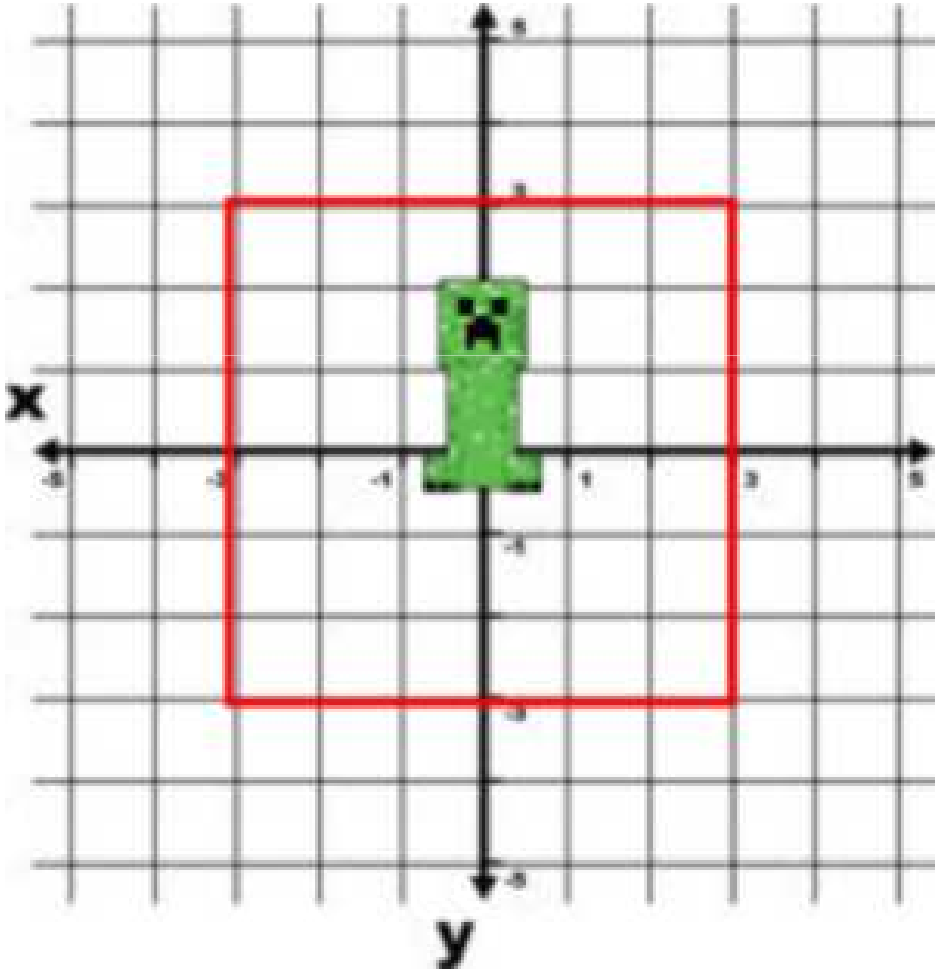


- We determine the *range* of how much it can see
- Then *scan* the area for the player near the mob

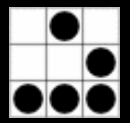
Mob sight

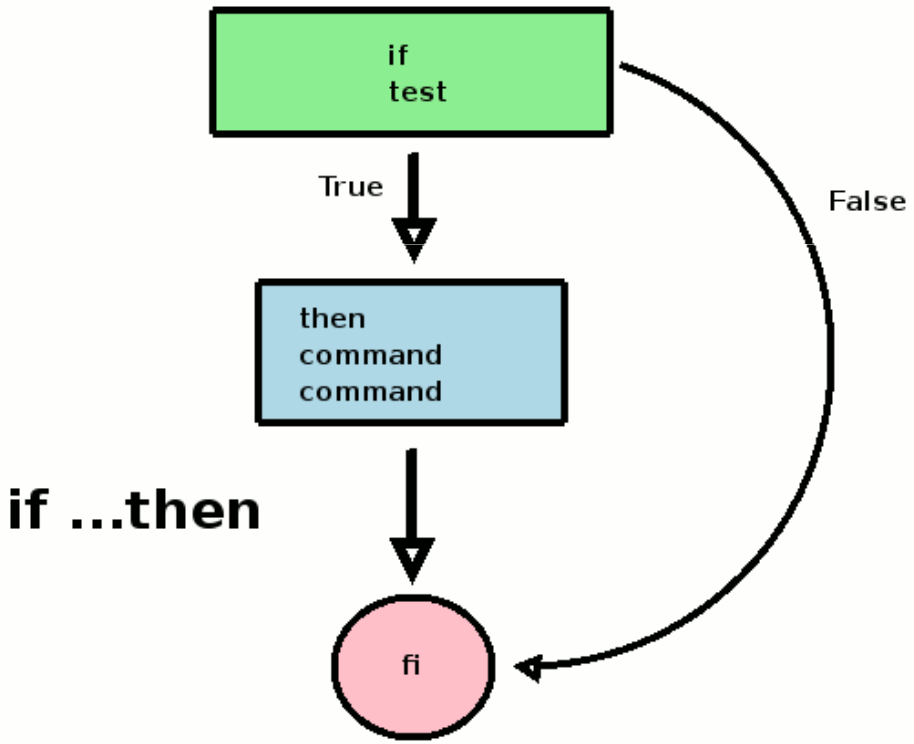


- I drew this a grid
- I translated that into an if statement

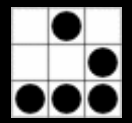


Conditionals



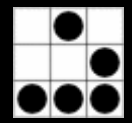


If else in Python



If statement :
    block if true
else:
    block if false

Challenge

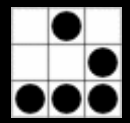


Make the mob follow you

Following the player

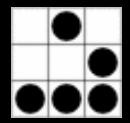
following.py and mob2.py

Reading code

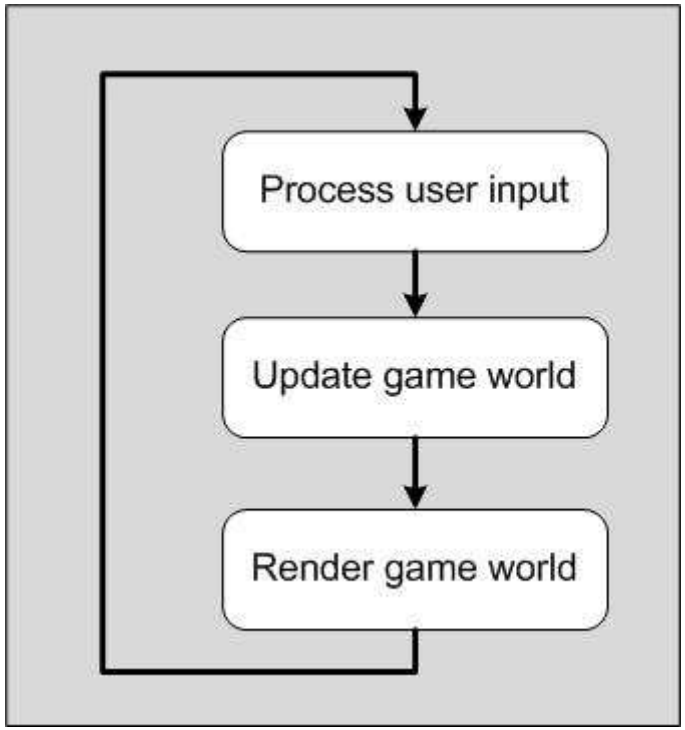


- following.py
  - We have a game loop
  - It is an infinite loop
- mob2.py
  - look() is new
  - scan() has changed
  - within_range() is different

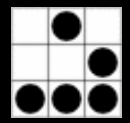
The game loop



- A loop that continues until the game ends
- It updates changes
- It checks for collision
- It redraws



Challenge

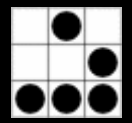


Make the mob teleport the player when it touches it

Inheritance and collision

tagging.py and weepingAngel.py

Reading Code

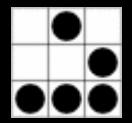


- tagging.py
  - Using WeepingAngel
- WeepingAngel.py
  - Missing many methods
  - Mob is being imported

The weeping angel

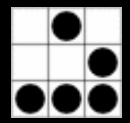
When they touch you they take you into the past

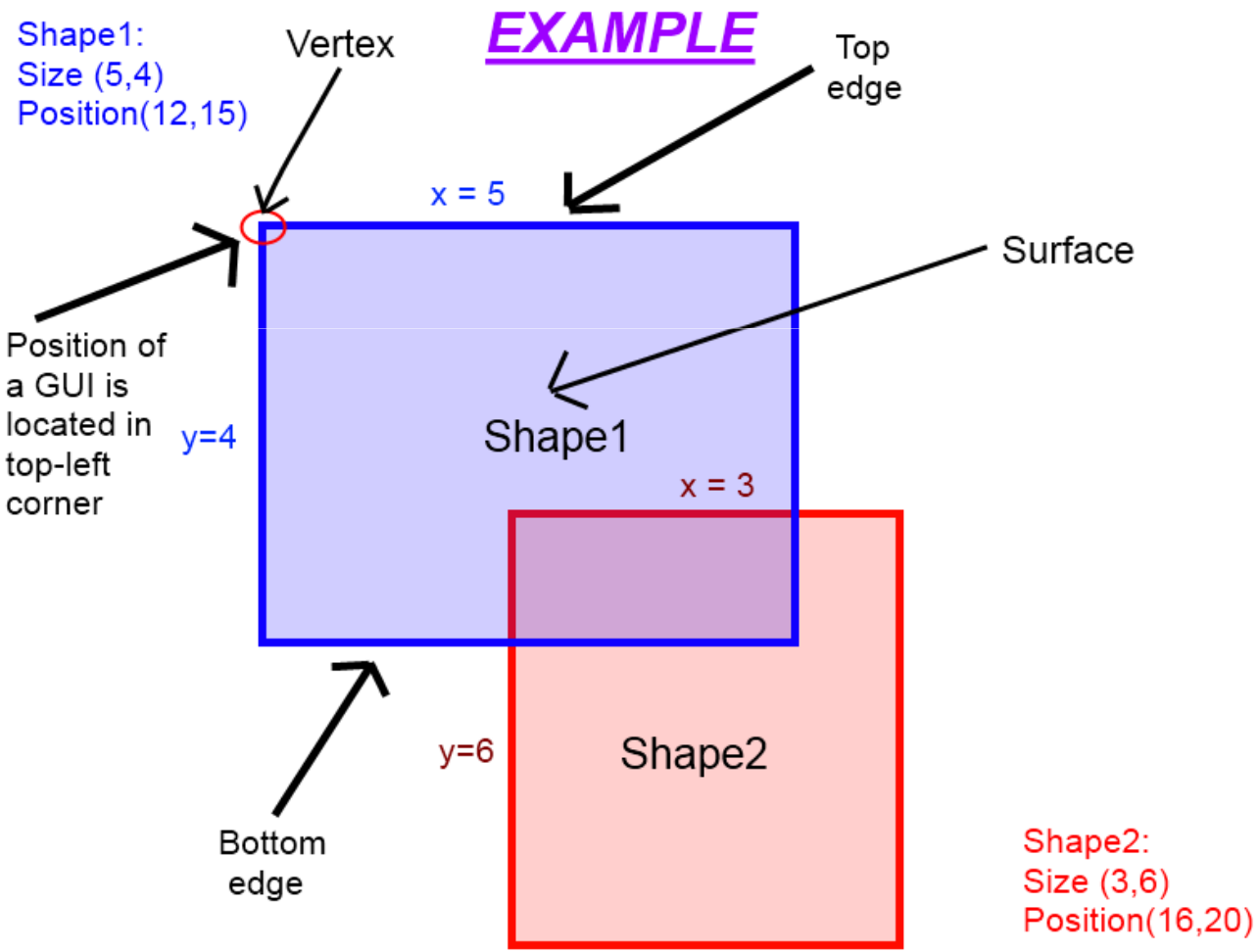
Collision detection



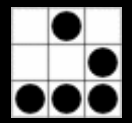
- We need to check if the column and the player have bumped
- The API doesn't have that yet ☹
- We can make our own

Collision detection

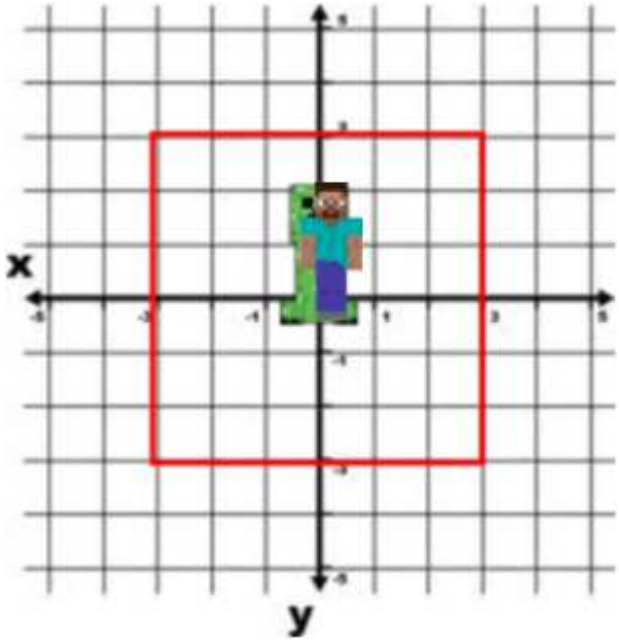


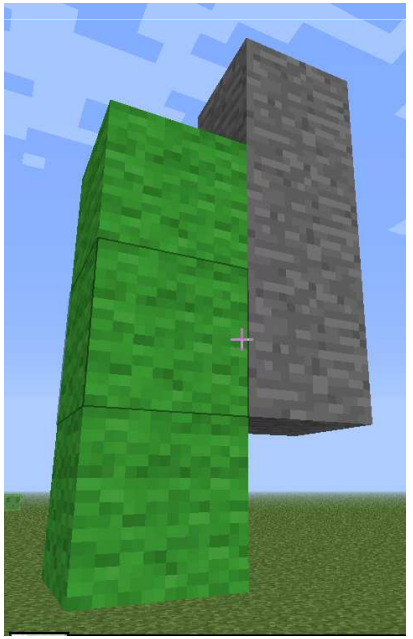


Breaking down detection

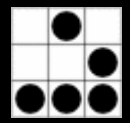


- We check that the mob and the player are on the same plane position
- We check that their vertical axis *overlaps*



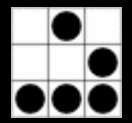


Inheritance, a fancier copy-and-paste

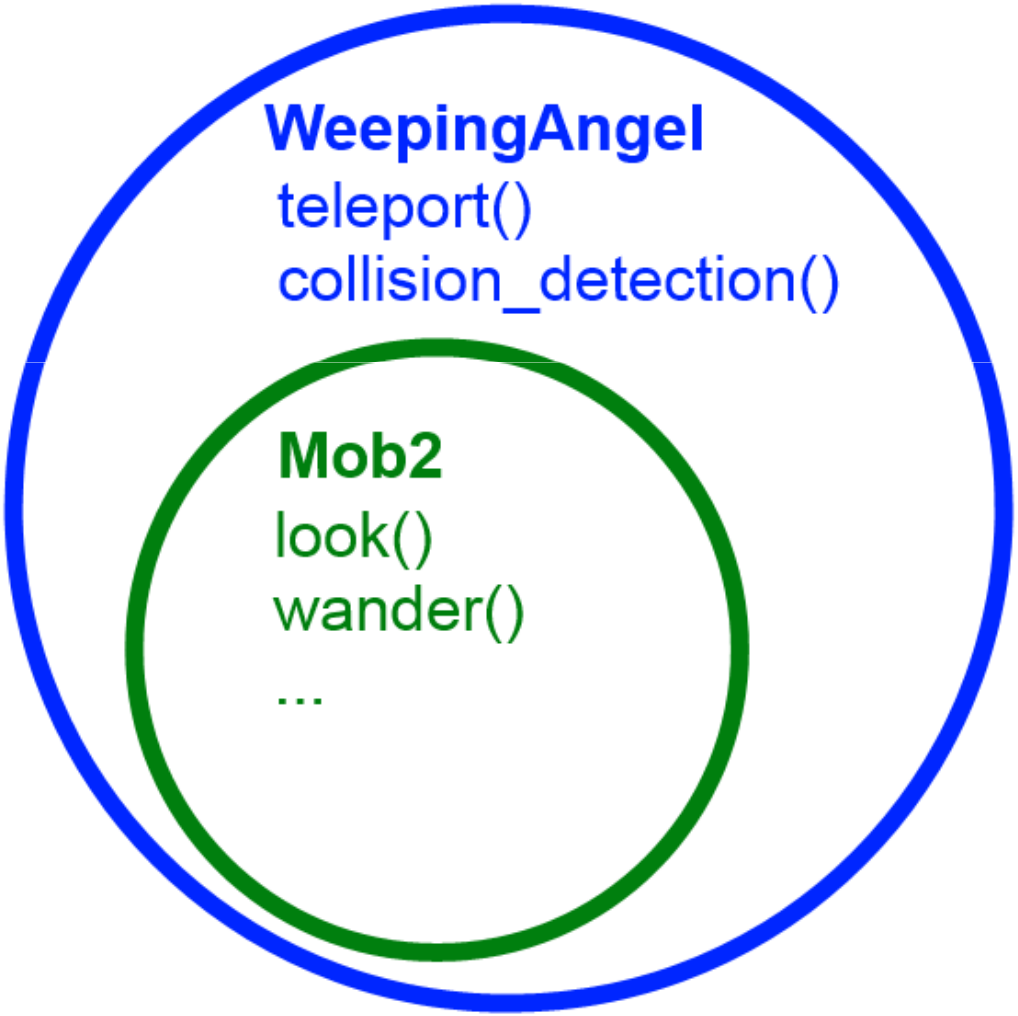


- Take all of mob2
- And add the following behavior
- Makes it easier to read
- Different special behaviors; same common behavior

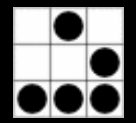
How it works



- Checks for methods In WeepingAngel first
- Not there? Then check in Mob2



Inheritance in Python



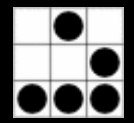
```
Class WeepingAngel(Mob):
    super(WeepingAngel, self).__init__(world,
    coordinates, distance)
```

- We add the parent class and an argument
- We initialize the parent class through the super method

End

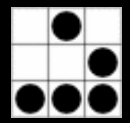
What to do from here

What have you learned?



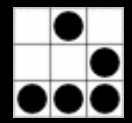
- It is fun
- It is not that hard
- It is okay to be a bit confused
- Tech vocabulary

Keep hacking



- Set a goal
- Break down the goal into steps
- Find code that will do something similar
- Tinker
- Share your work

Parents, what's next?



- Find achievable goals
- Breaking down tasks
- Help reading documentation
- Can't do it all by yourself? Ask for help

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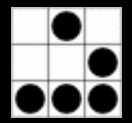
CoderDojoDC+SUBSCRIBE@googlegroups.com

My contact information



@hugoestr

hugoestr at gmail dot com