# Object Oriented Programming

- What is object-oriented programming?
  - A way of thinking and structuring a program
  - Instead of just writing line-by-line, make objects and then use them
- Why do we care?
  - NLTK (Natural Language Toolkit), a very important library for linguists
  - We've been working with objects all along! (Strings and lists)
  - It can make programming simpler

# What Is An Object?

- An object is hard to define
  - Think of it as a container for data
  - Two important things: fields and methods
  - Fields: data stored in the object
  - Example: A string is a type of object
  - A data field in a string would be its length
  - A method for a string would be split

# How Do You Use An Object?

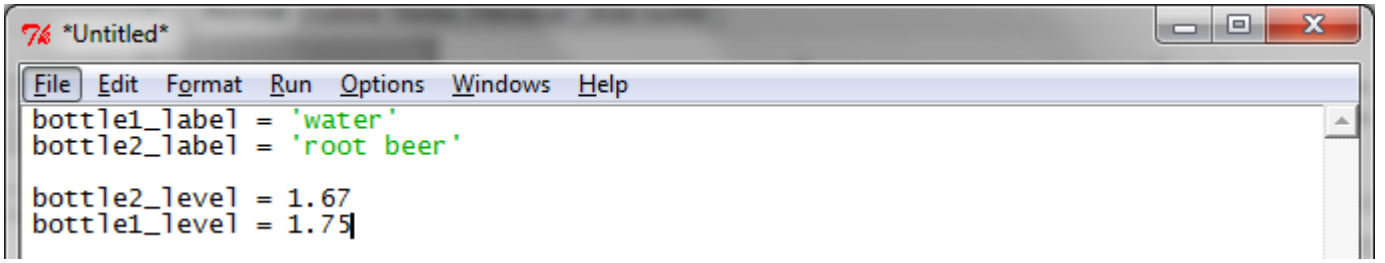
- Let's say you have an object called a Person.
- Person has the data fields name and age, and method greet.

```
doug = Person()
doug.name = “Doug Jones”
doug.age = 22
doug.greet() ← assume we have this defined
→ “Doug Jones says hello!”
```

- Does this syntax look familiar?

# Why Use Objects?

- Imagine trying to compare two bottles
- These two bottles have a name, indicating what liquid is in them
- They also have a number indicating how much liquid is in them

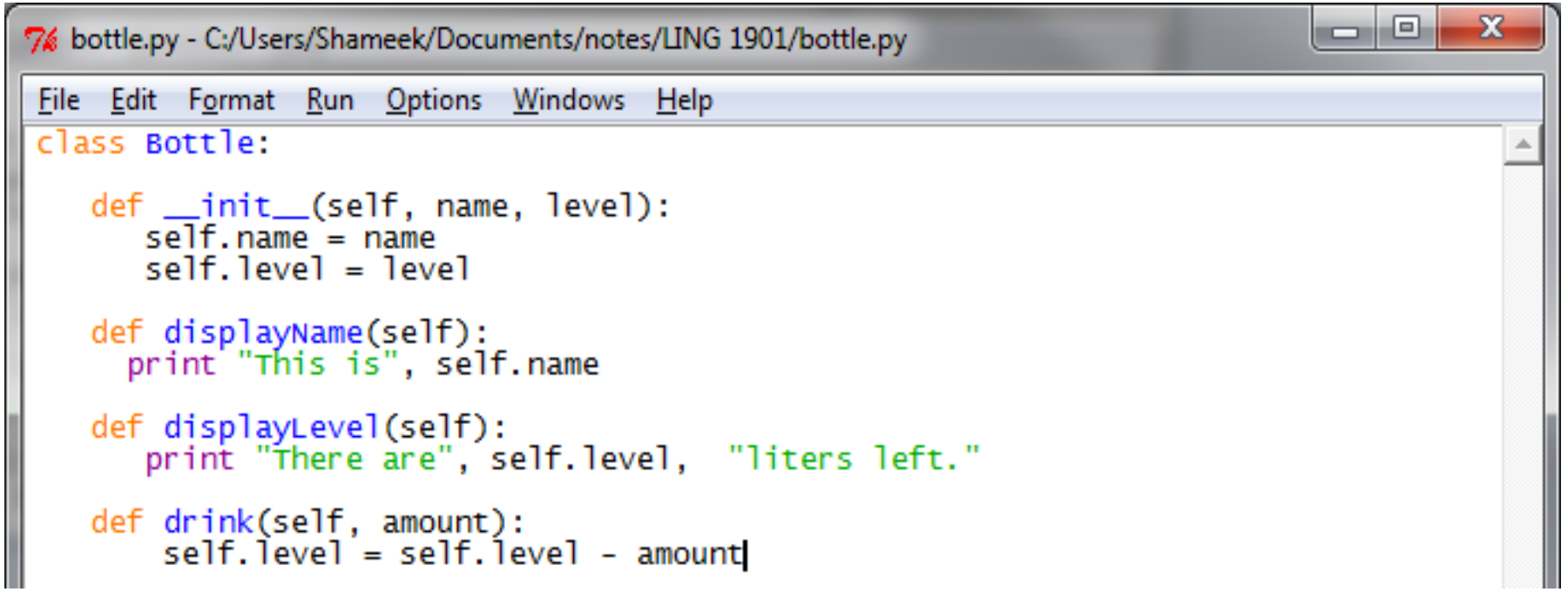


# Why Use Objects? Part 2

- Imagine having to change the level in one of these bottles, repeatedly, because someone is drinking from it
- With an object, you can have a method that represents this
- Instead of:
  `bottle1.level = bottle1.level - 0.25`

```
bottle.drink(0.25)
```

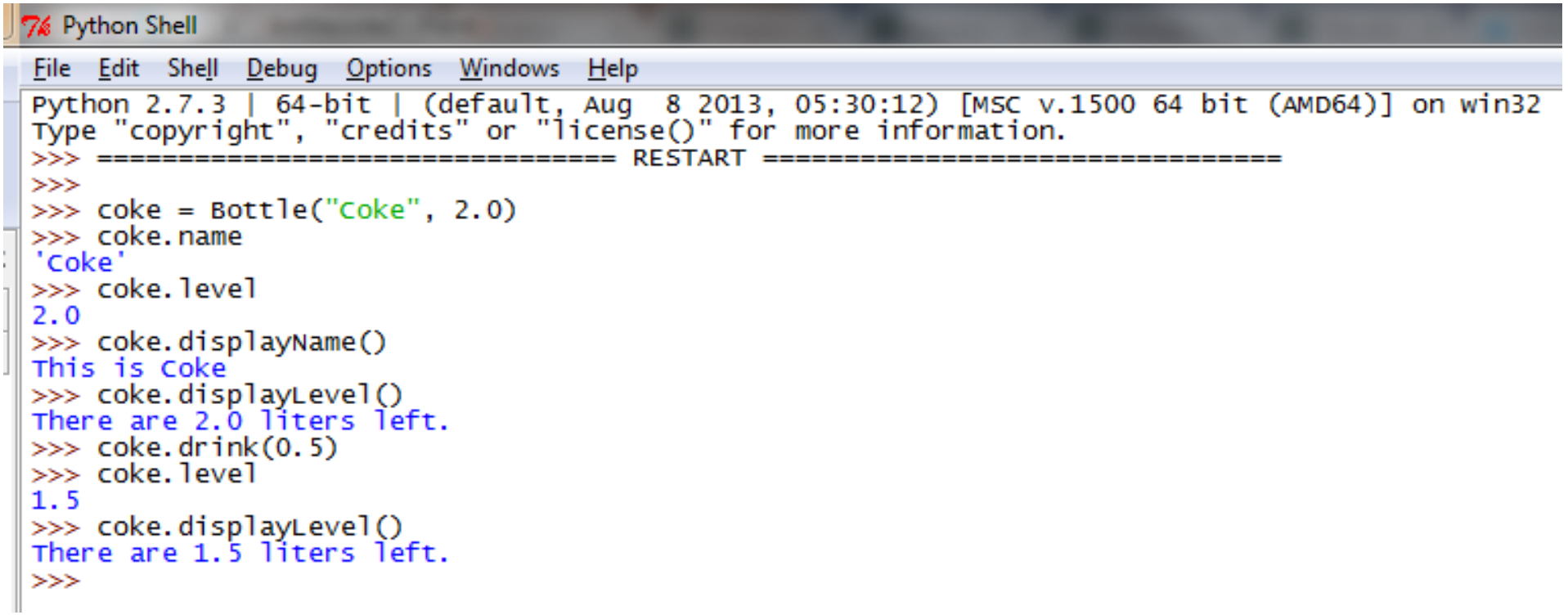
# How To Make Objects



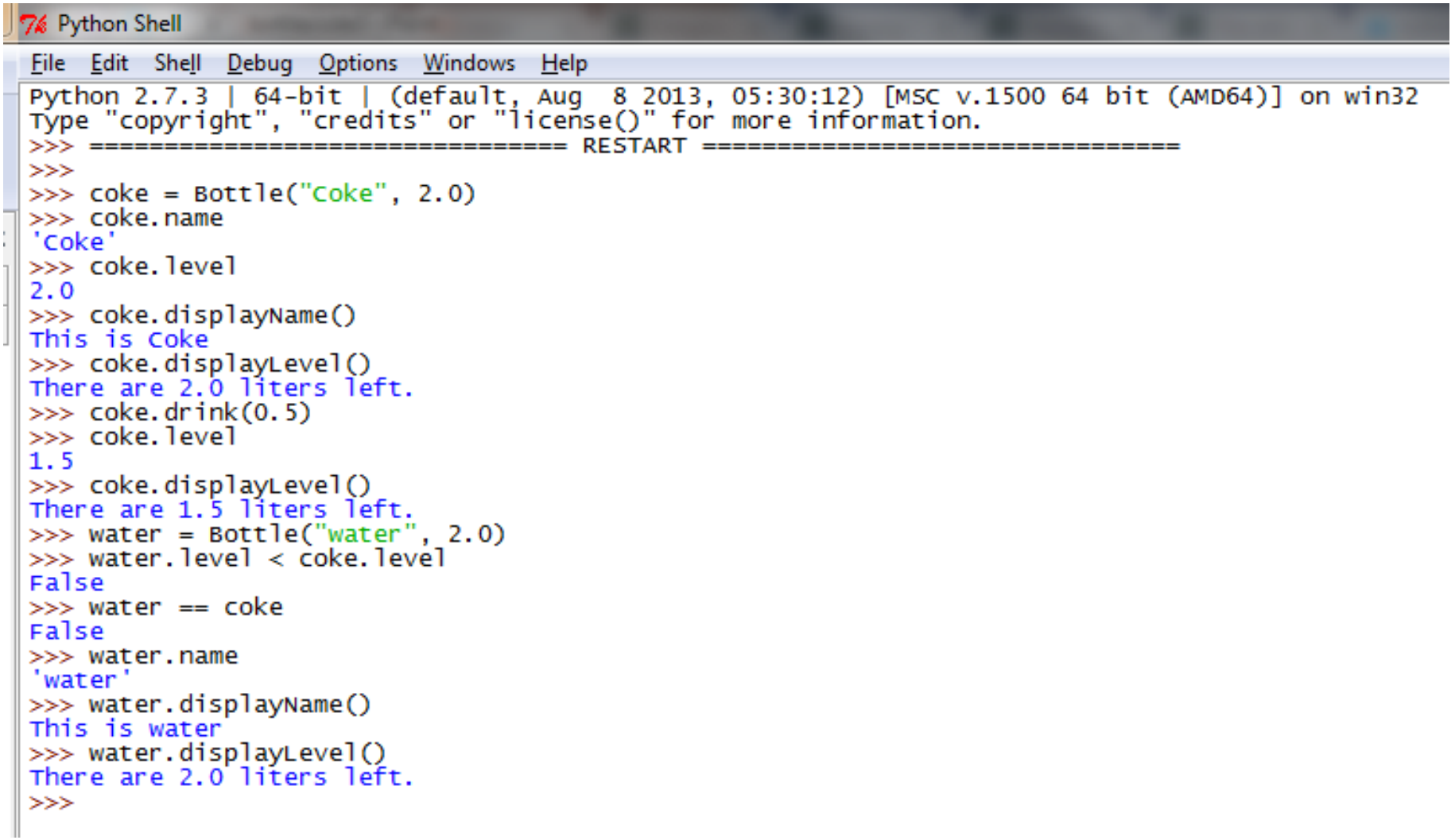
# Some notes on that

- What is this “self” thing?
  - Objects are built from the inside, so an object needs a way to refer to itself
  - __init__ is how you build an object – every object has one
  - The method you build an object with is called a constructor
  - It carves out a space in memory and inserts everything into the correct place

# How To Use Objects



# How To Use Objects, Part 2



# Again, Why Do We Care?

- You have been working with objects all along (Strings and lists)
- Knowing how objects work helps you understand the way people program
- Many libraries which you might use if you get deeper into programming use objects (NLTK, BeautifulSoup, minidom, etc.)