Object Oriented Programming
Making Your Own Data Types

C-START Python PD Workshop
A simple class can be defined like so:

```python
class Point:
    def __init__(self, x, y):
        self.x, self.y = x, y
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A few things to notice:

- `__init__` is the initializes the object. It’s actually what is called a **magic method**
- All the methods of the class take a parameter `self`, the object you are working on
Magic methods are methods with certain names that allow you to bind features of your class to certain Python features.

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**Why do this rather than .equals(), .length() and such?**

*In the face of ambiguity, refuse the temptation to guess. There should be one – and preferably only one – obvious way to do it.*

Avoid `.length()`, `.getLength()`, `.size()` inconsistencies
Properties

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Python’s properties allow you to make your variable public to begin with, and then write getters and setters only once they are needed to actually check something.
Using Properties

```python
class CameraSensor:
    def __init__(self):
        self.brightness = 10

    def take_picture(self):
        # do something
        return image

camera = CameraSensor()
camera.brightness = 40
camera.take_picture()
```
Using Properties

```python
class CameraSensor:
    def __init__(self):
        self._brightness = 10

    def take_picture(self):
        # do something
        return image

@property
def brightness(self):
    return self._brightness

@brightness.setter
def brightness(self, value):
    if not 0 <= value <= 100:
        raise ValueError
    self._brightness = value

camera = CameraSensor()
camera.brightness = 40
camera.take_picture()
```