Adding Classes to a Package

SOFTWARE ENGINEERING PRINCIPLES IN PYTHON

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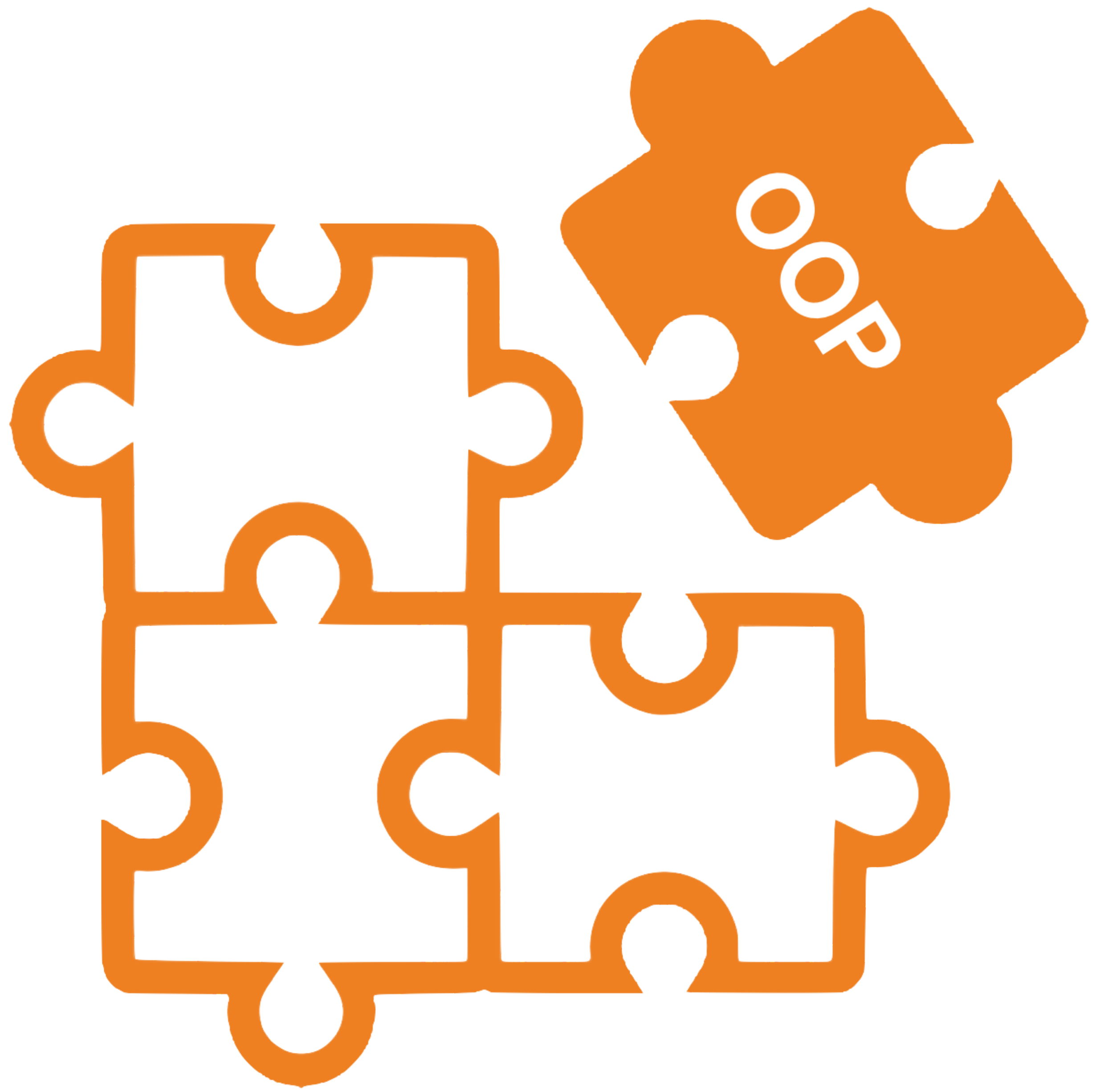
Object oriented programming



Anatomy of a class

working in `work_dir/my_package/my_class.py`

```python
# Define a minimal class with an attribute
class MyClass:
    """A minimal example class

    :param value: value to set as the ``attribute`` attribute
    :ivar attribute: contains the contents of ``value`` passed in init
    """

    # Method to create a new instance of MyClass
    def __init__(self, value):
        # Define attribute with the contents of the value param
        self.attribute = value
```

Using a class in a package

working in `work_dir/my_package/__init__.py`

```
from .my_class import MyClass
```

working in `work_dir/my_script.py`

```
import my_package

# Create instance of MyClass
my_instance = my_package.MyClass(value='class attribute value')

# Print out class attribute value
print(my_instance.attribute)
```

```
'class attribute value'
```

The self convention

working in `work_dir/my_package/my_class.py`

```
# Define a minimal class with an attribute
class MyClass:
    """A minimal example class

    :param value: value to set as the ``attribute`` attribute
    :ivar attribute: contains the contents of ``value`` passed in init
    """

    # Method to create a new instance of MyClass
    def __init__(self, value):
        # Define attribute with the contents of the value param
        self.attribute = value
```

```
my_instance = my_package.MyClass(value='class attribute value')
```

Let's Practice

Leveraging Classes

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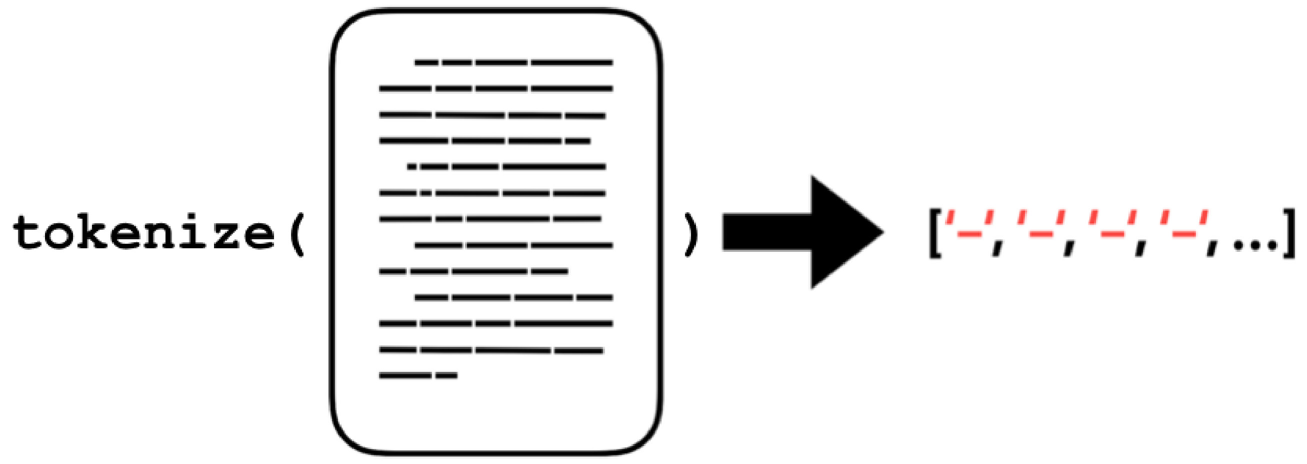
Extending Document class

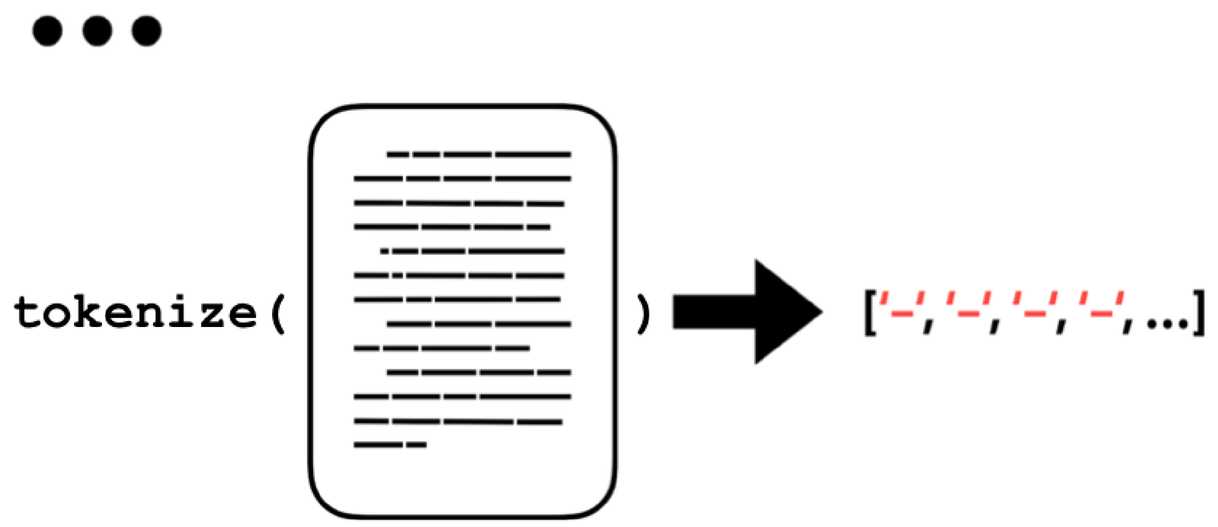
```python
class Document:
    def __init__(self, text):
        self.text = text
```



Current document class

```python
class Document:
    def __init__(self, text):
        self.text = text
```

```
def __init__():
```



Revising __init__

```python
class Document:
    def __init__(self, text):
        self.text = text
        self.tokens = self._tokenize()

doc = Document('test doc')
print(doc.tokens)
```

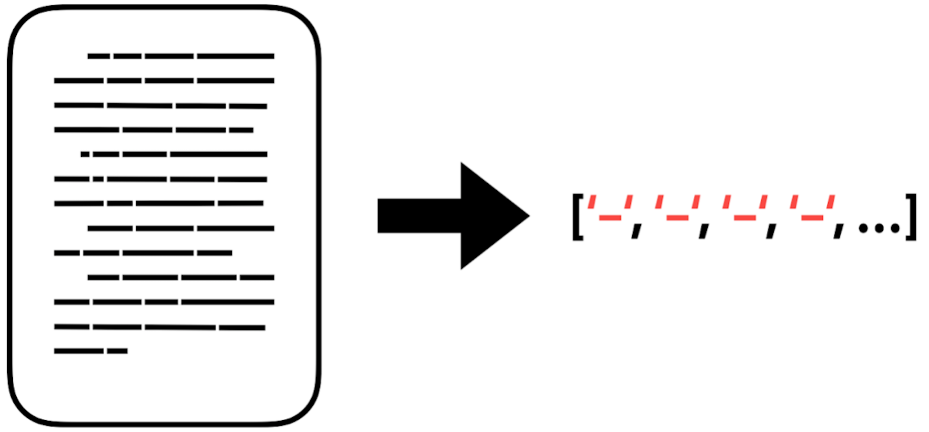
```
['test', 'doc']
```

Adding _tokenize() method

```python
# Import function to perform tokenization
from .token_utils import tokenize
class Document:
    def __init__(self, text, token_regex=r'[a-zA-Z]+'):
        self.text = text
        self.tokens = self._tokenize()
    def _tokenize(self):
        return tokenize(self.text)
```

Non-public methods

```
def __init__():
    ...
```



The risks of non-public methods

- Lack of documentation
- Unpredictability

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Classes and the DRY principle

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Creating a SocialMedia Class

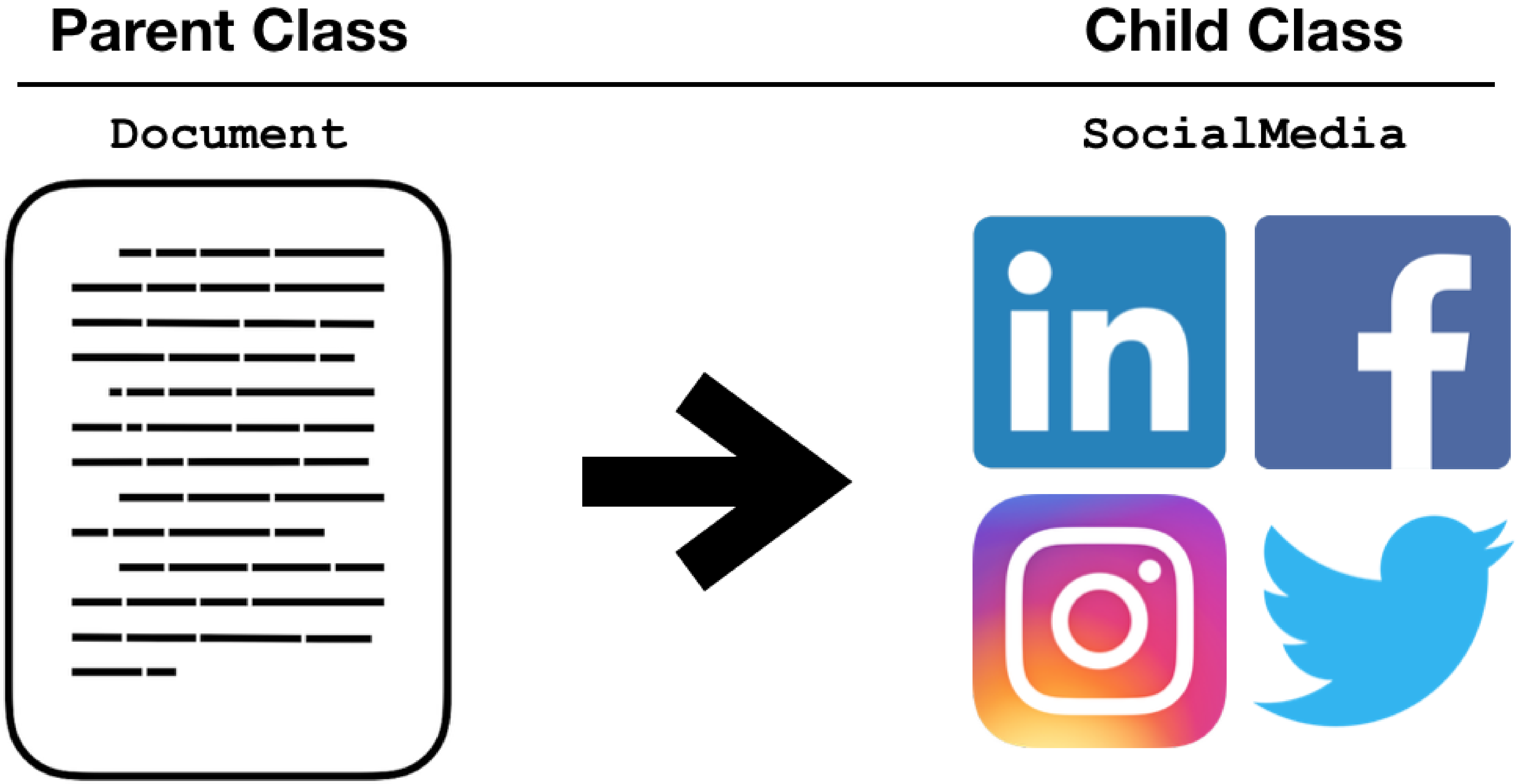
The DRY principle

The DRY principle

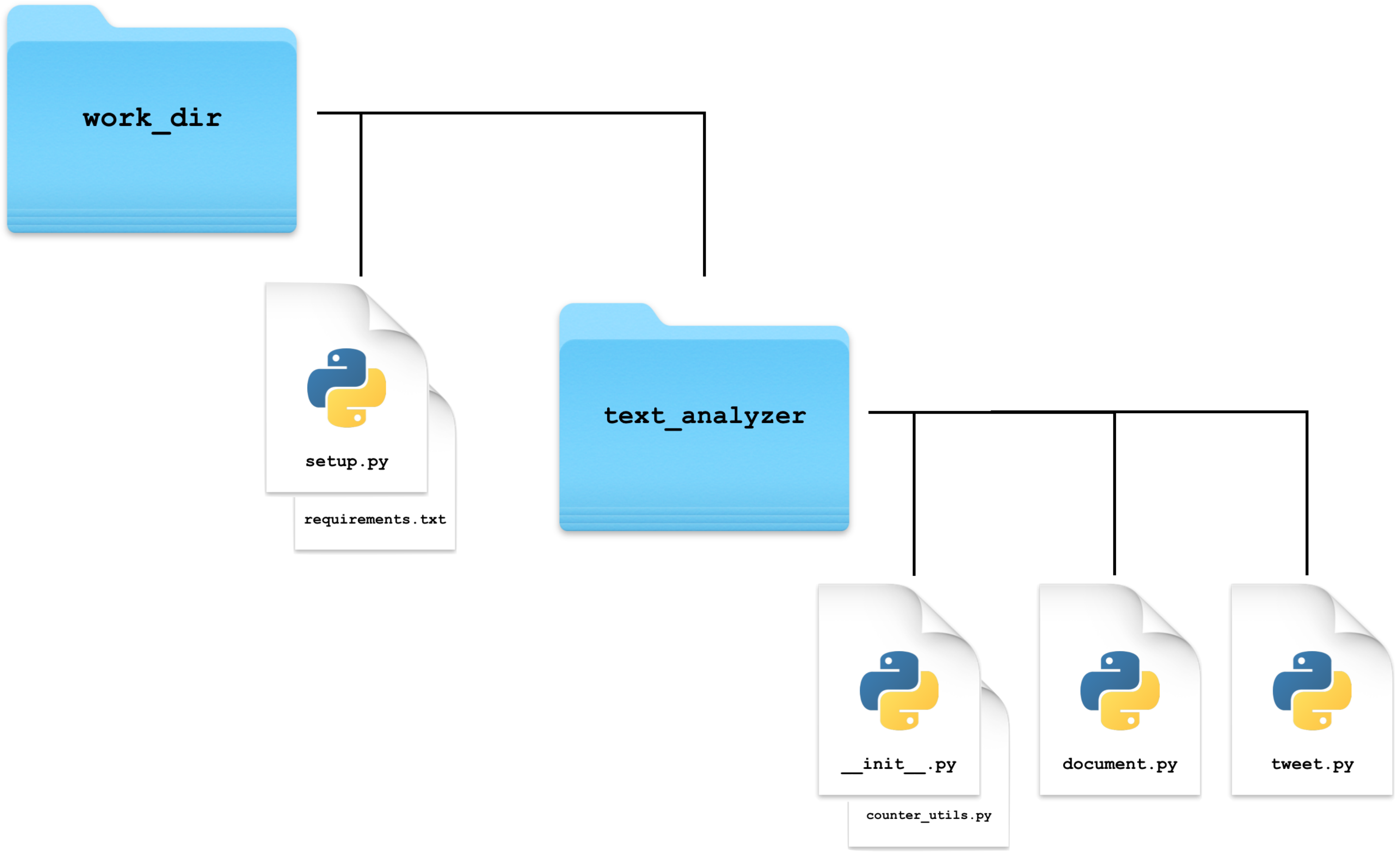
The DRY principle

The DRY principle

Intro to inheritance



Inheritance in Python



Inheritance in Python

```python
# Import ParentClass object
from .parent_class import ParentClass

# Create a child class with inheritance
class ChildClass(ParentClass):
    def __init__(self):
        # Call parent's __init__ method
        ParentClass.__init__(self)
        # Add attribute unique to child class
        self.child_attribute = "I'm a child class attribute!"

# Create a ChildClass instance
child_class = ChildClass()
print(child_class.child_attribute)
print(child_class.parent_attribute)
```

Let's Practice

Multilevel inheritance

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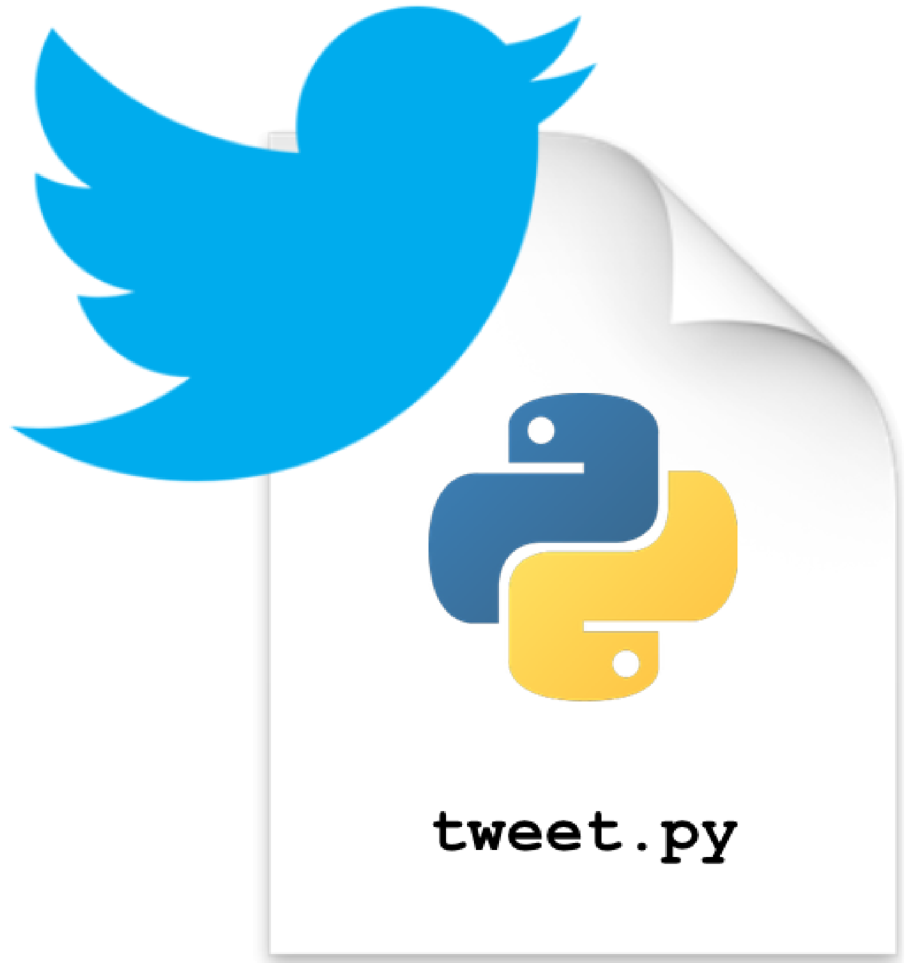
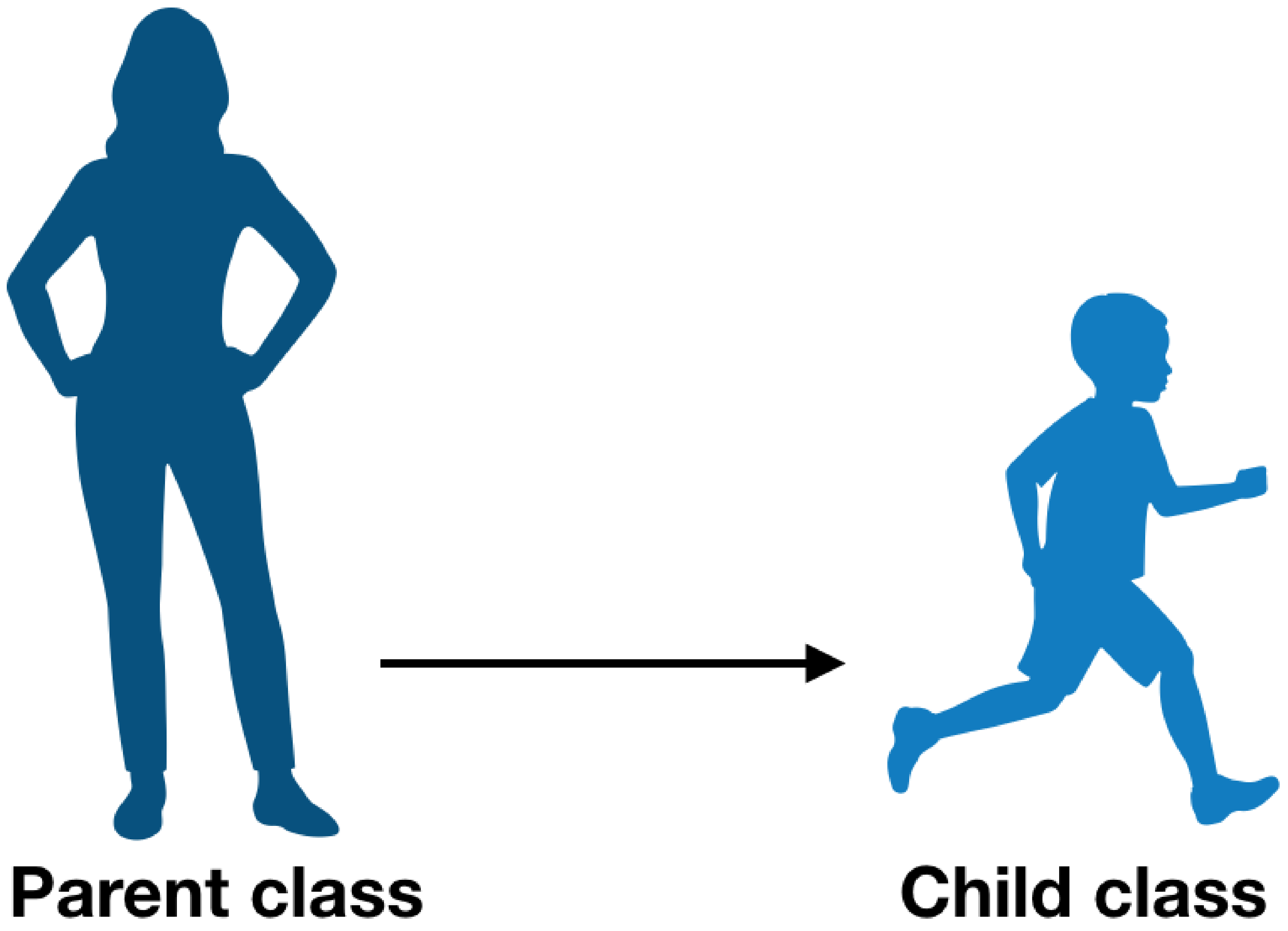
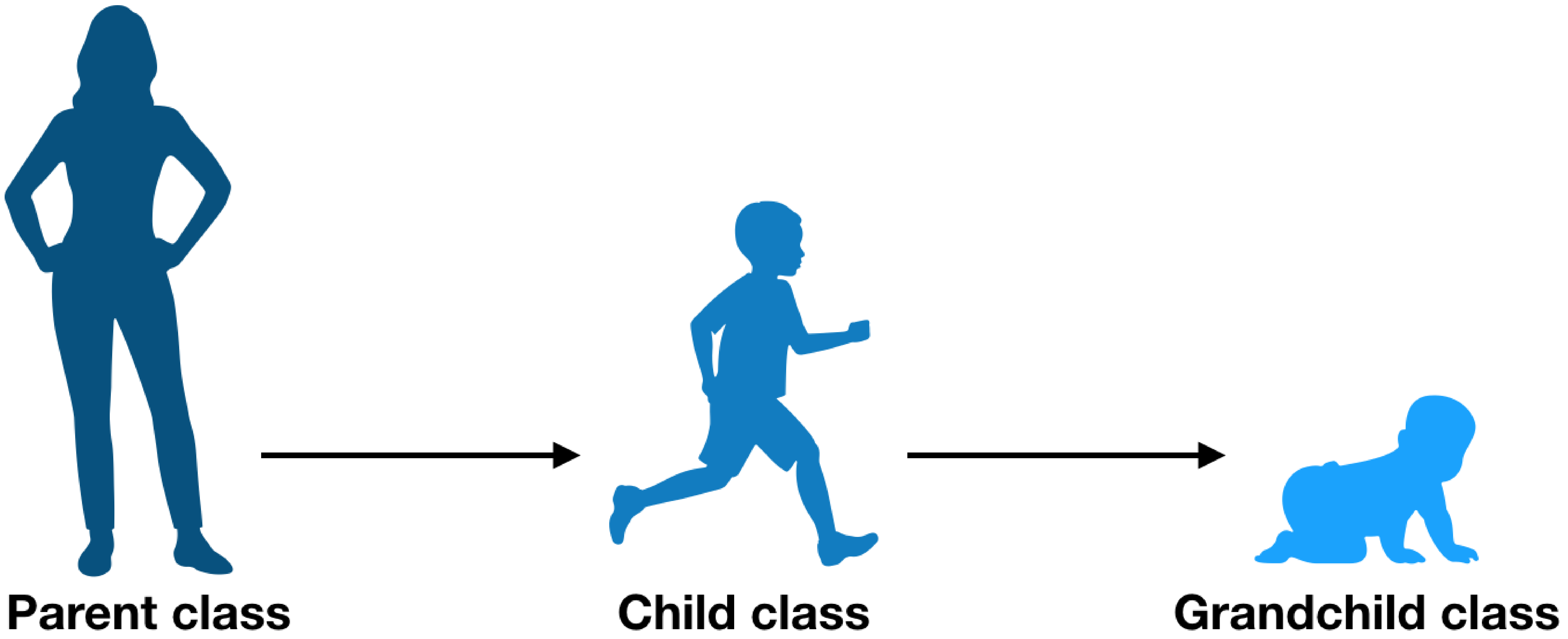
Creating a Tweet class



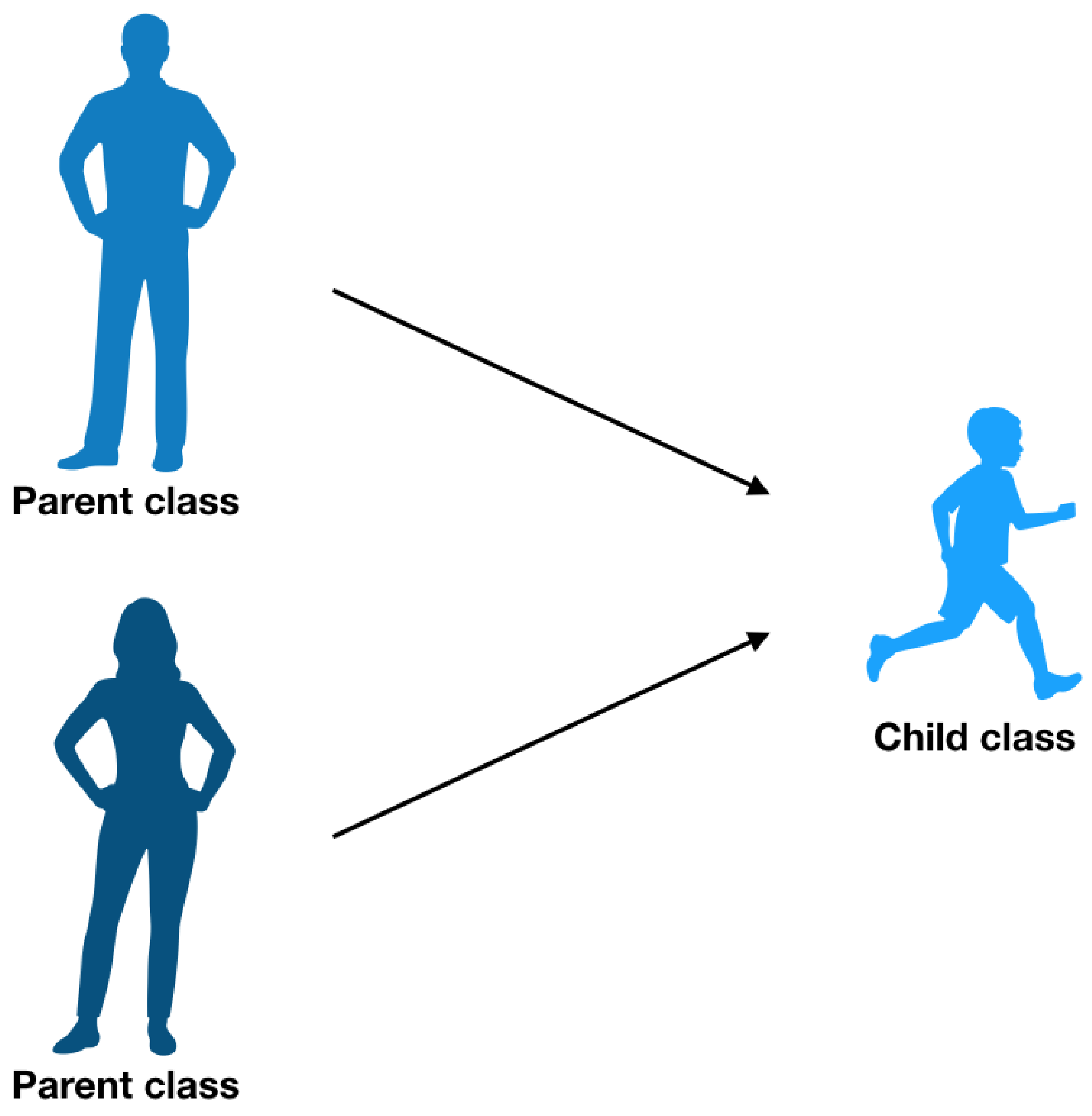
Multilevel inheritance



Multilevel inheritance



Multiple inheritance



Multilevel inheritance and super

```python
class Parent:
    def __init__(self):
        print("I'm a parent!")


class Child(Parent):
    def __init__(self):
        Parent.__init__()
        print("I'm a child!")

class SuperChild(Child):
    def __init__(self):
        super().__init__()
        print("I'm a super child!")
```

Learn more about multiple inheritance & `super()` .

Multilevel inheritance and super

```python
class Parent:
    def __init__(self):
        print("I'm a parent!")

class SuperChild(Parent):
    def __init__(self):
        super().__init__()
        print("I'm a super child!")

class Grandchild(SuperChild):
    def __init__(self):
        super().__init__()
        print("I'm a grandchild!")

grandchild = Grandchild()
```

```
I'm a parent!
I'm a super child!
I'm a grandchild!
```

Keeping track of inherited attributes

```python
# Create an instance of SocialMedia
sm = SocialMedia('@DataCamp #DataScience #Python #sklearn')
# What methods does sm have?  ¯\_( )_/¯
dir(sm)
```

```
['__class__', '__delattr__', '__dict__', '__dir__', '__doc__', '__eq__',
'__format__', '__ge__', '__getattribute__', '__gt__', '__hash__', '__init__',
'__init_subclass__', '__le__', '__lt__', '__module__', '__ne__', '__new__',
'__reduce__', '__reduce_ex__', '__repr__', '__setattr__', '__sizeof__',
'__str__', '__subclasshook__', '__weakref__', '_count_hashtags',
'_count_mentions', '_count_words', '_tokenize', 'hashtag_counts',
'mention_counts', 'text', 'tokens', 'word_counts']
```

Let's Practice

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