Help   sandipan_dey ⌄

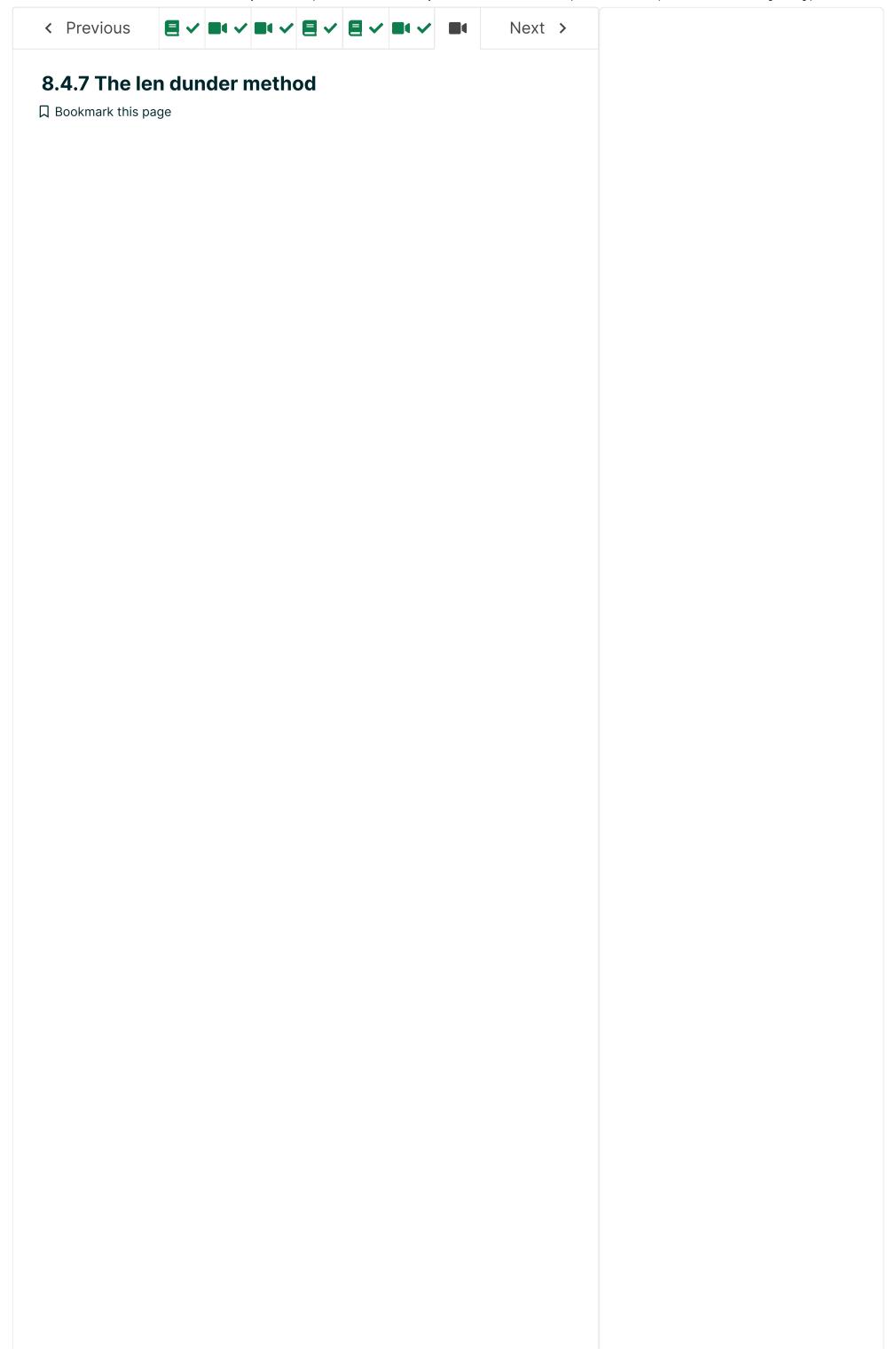**Course**   Progress   Dates   Discussion   MO Index

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8.4.7 The len dunder method

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MO2.2

Python has a variety of special class methods for manipulating objects which are denoted with double underscores immediately before and after the name of the method. These methods are frequently referred to as *dunder methods*, short for double underscore. They also often are called *magic methods* as they have special uses beyond a usual class method.

You have already met one of these methods, `__init__`, which is the method called during the instantiation of an object. One of the magic aspects of this method is that it is (usually) invoked not by calling it directly, but rather through a call to the class name. For example,

```
myIVPobject = IVP(uI, tI, tF, p, f)
```

will result in the invocation of the `IVP.__init__` method.

Now we will introduce another dunder method: `__len__`. As you might expect, this method is intended to return the length of an object of the class. The magic of this method is that it is called when the Python `len` function is called, so:

```
print(f"The length of myIVPobject = {len(myIVPobject)}")
```

calls `myIVPobject.__len__()`. The existence of this dunder method allows the class designer to determine what is meant by the length of that object. For our IVP class, a reasonable definition is that the length is the number of states in the IVP (i.e. M in our IVP standard notation). Here's the chunk of the IVP class definition that implements `__len__`.

```
def __len__(self):
    """
    length is defined as number of states (in _uI)
    """
    return len(self._uI)
```

The modified `IVPlib` and `coffee_model` codes incorporating information hiding, getters, and the `__len__` dunder method are available for download here.

Video introducing dunder methods

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dunder means Double
Underscore, and that's
because the methods

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