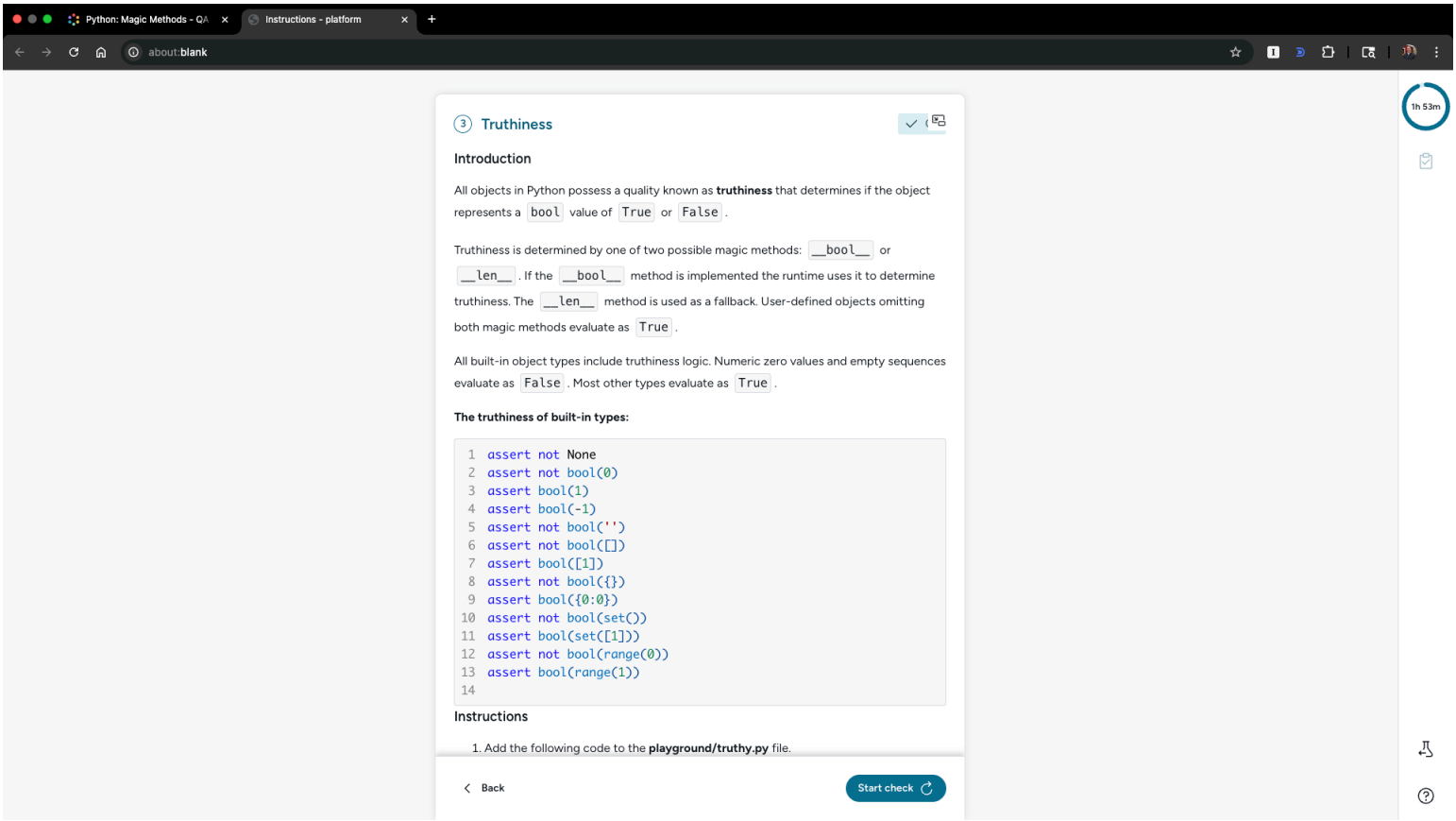
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3 Truthiness
Introduction
All objects in Python possess a quality known as truthiness that determines if the object represents a bool value of True or False.
Truthiness is determined by one of two possible magic methods: __bool__ or __len__. If the __bool__ method is implemented the runtime uses it to determine truthiness. The __len__ method is used as a fallback. User-defined objects omitting both magic methods evaluate as True.
All built-in object types include truthiness logic. Numeric zero values and empty sequences evaluate as False. Most other types evaluate as True.
The truthiness of built-in types:
assert not None
assert not bool(0)
assert bool(1)
assert bool(-1)
assert not bool('')
assert not bool([])
assert bool([1])
assert not bool({})
assert bool({0:0})
assert not bool(set())
assert bool(set([1]))
assert not bool(range(0))
assert bool(range(1))
Instructions
1. Add the following code to the playground/truthy.py file.
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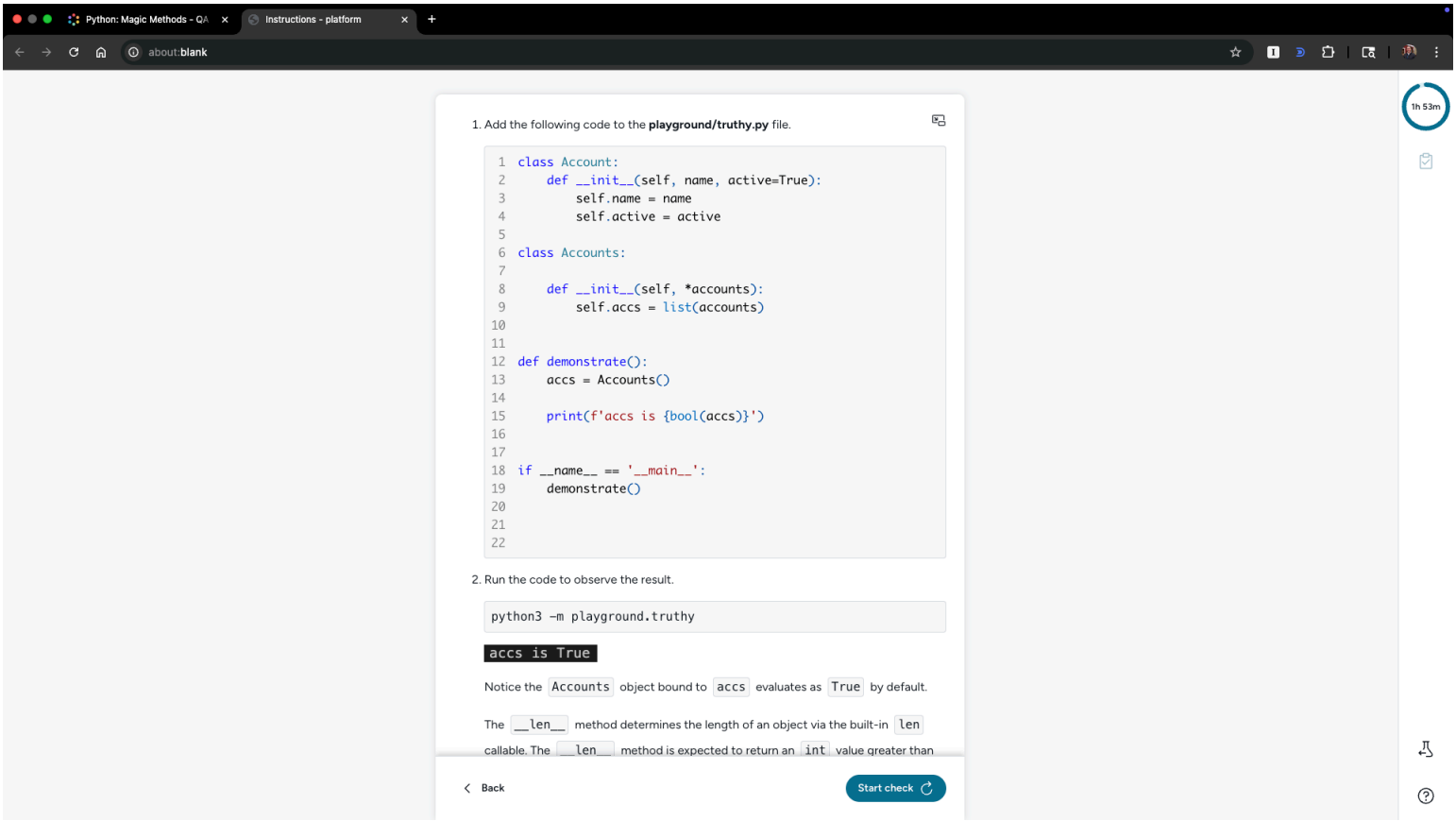
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1. Add the following code to the playground/truthy.py file.
class Account:
def __init__(self, name, active=True):
self.name = name
self.active = active
class Accounts:
def __init__(self, *accounts):
self.accs = list(accounts)
def demonstrate():
accs = Accounts()
print(f'accs is {bool(accs)}')
if __name__ == '__main__':
demonstrate()
2. Run the code to observe the result.
python3 -m playground.truthy
accs is True
Notice the Accounts object bound to accs evaluates as True by default.
The __len__ method determines the length of an object via the built-in len
callable. The __len__ method is expected to return an int value greater than
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The `__len__` method determines the length of an object via the built-in `len` callable. The `__len__` method is expected to return an `int` value greater than or equal to zero.

The `__len__` method is used as a fallback for determining truthiness if the `__bool__` method is not implemented. A value of zero evaluates as `False` otherwise `True`.

3. Append the following method to the `Accounts` class.

```
    def __len__(self):
        print('called the __len__ method.')
        return len(self.accs)


```

```
class Accounts:

    def __init__(self, *accounts):
        self.accs = list(accounts)

    def __len__(self):
        print('called the __len__ method.')
        return len(self.accs)
```

4. Run the code to observe the result.

```
python3 -m playground.truthy
```

```
called the __len__ method.
accs is False
```

The object bound to `accs` now evaluates as `False` because the `Accounts` instance contains zero `Account` objects.

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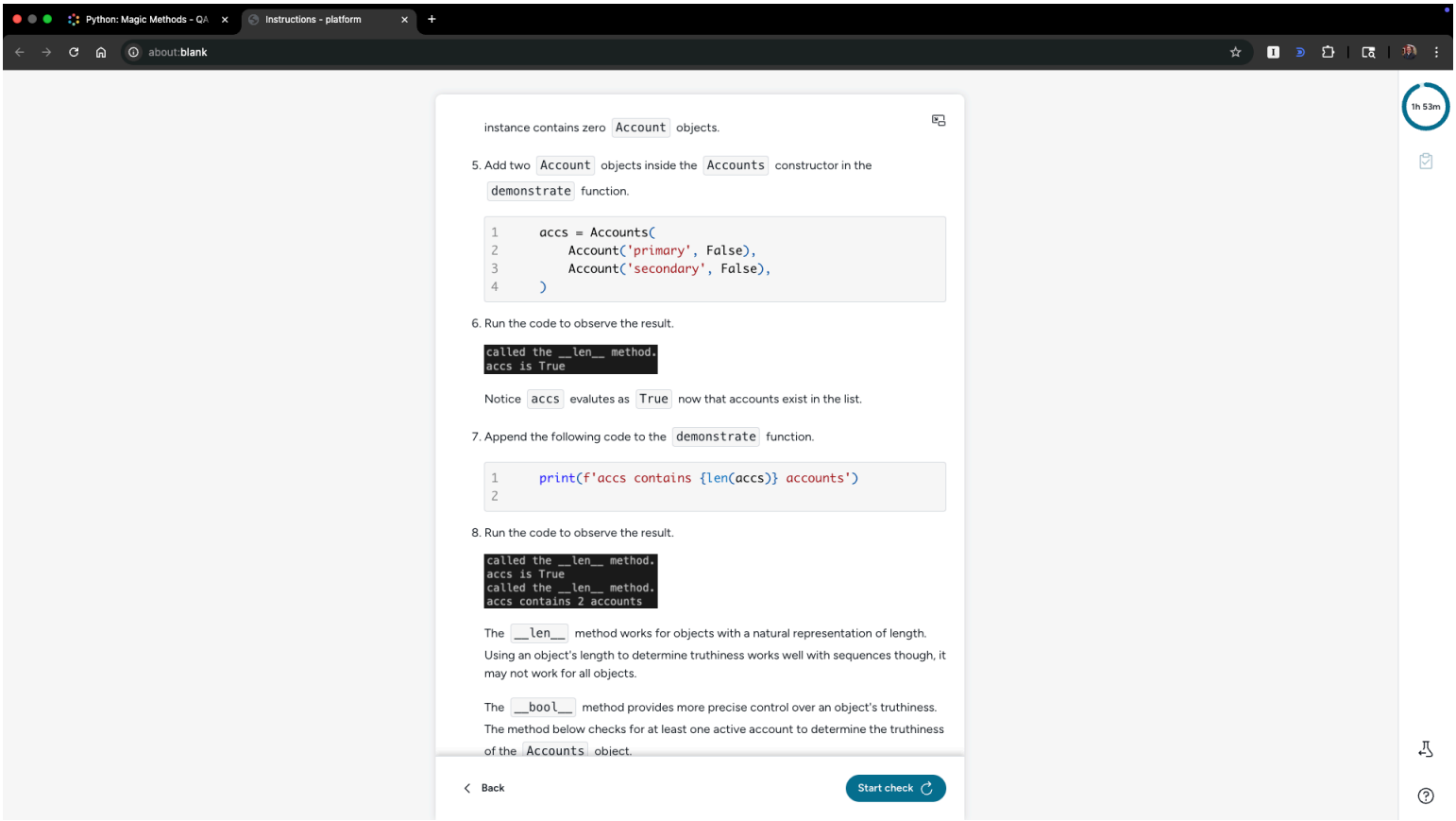
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instance contains zero Account objects.
5. Add two Account objects inside the Accounts constructor in the demonstrate function.
accs = Accounts(
Account('primary', False),
Account('secondary', False),
)
6. Run the code to observe the result.
called the __len__ method.
accs is True
Notice accs evalutes as True now that accounts exist in the list.
7. Append the following code to the demonstrate function.
print(f'accs contains {len(accs)} accounts')
8. Run the code to observe the result.
called the __len__ method.
accs is True
called the __len__ method.
accs contains 2 accounts
The __len__ method works for objects with a natural representation of length. Using an object's length to determine truthiness works well with sequences though, it may not work for all objects.
The __bool__ method provides more precise control over an object's truthiness. The method below checks for at least one active account to determine the truthiness of the Accounts object.
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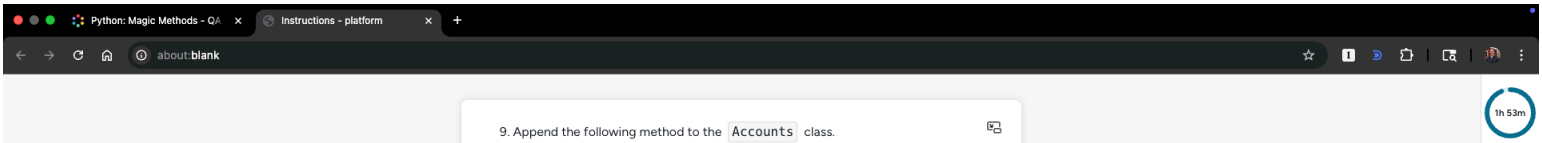


9. Append the following method to the `Accounts` class.

```
    def __bool__(self):
        print('called the __bool__ method.')
        return any(a for a in self.accs if a.active)


```

10. Run the code to observe the result.

```
called the __bool__ method.
accs is False
called the __len__ method.
accs contains 2 accounts
```

With both the `__bool__` and `__len__` methods implemented the runtime uses the `__bool__` method to determine truthiness and the `__len__` method strictly for determining object length. The result is `False` because both accounts are inactive.

11. Make one account active.

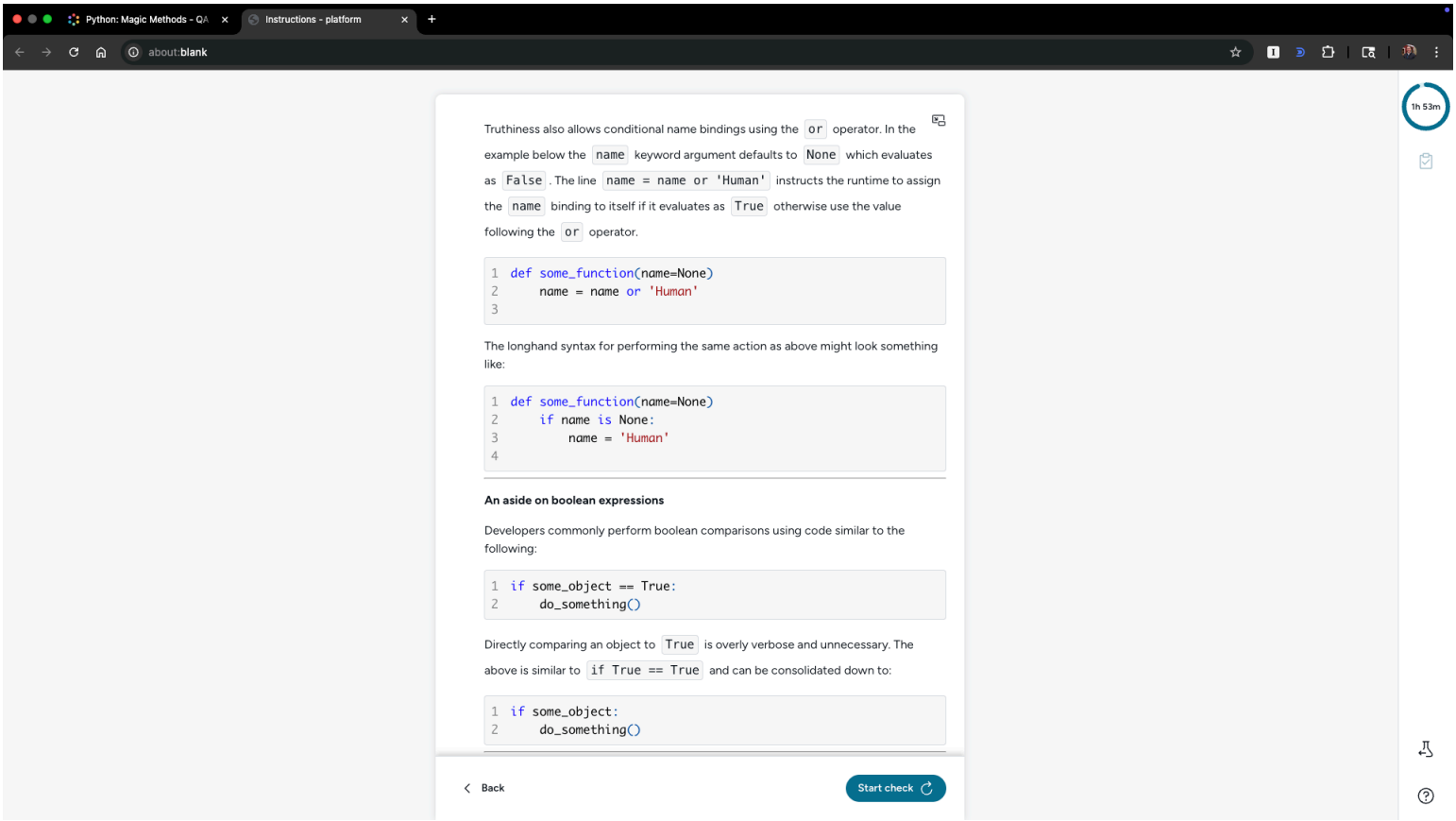
```
    accs = Accounts(
        Account('primary'),
        Account('secondary', False),
    )
```

12. Run the code to observe the result.

```
called the __bool__ method.
accs is True
called the __len__ method.
accs contains 2 accounts
```

Having finite control over an object's truthiness reduces the amount of code required to perform boolean operations.

Truthiness also allows conditional name bindings using the `or` operator. In the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Truthiness also allows conditional name bindings using the or operator. In the example below the name keyword argument defaults to None which evaluates as False. The line name = name or 'Human' instructs the runtime to assign the name binding to itself if it evaluates as True otherwise use the value following the or operator.
1 def some_function(name=None)
2 name = name or 'Human'
3
The longhand syntax for performing the same action as above might look something like:
1 def some_function(name=None)
2 if name is None:
3 name = 'Human'
4
An aside on boolean expressions
Developers commonly perform boolean comparisons using code similar to the following:
1 if some_object == True:
2 do_something()
Directly comparing an object to True is overly verbose and unnecessary. The above is similar to if True == True and can be consolidated down to:
1 if some_object:
2 do_something()
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13. Append the following code to the `demonstrate` function.

```
    if accs:
        print('at least one account is active')

```

14. Run the code to observe the result.

```
called the __bool__ method.
accs is True
called the __len__ method.
accs contains 2 accounts
called the __bool__ method.
at least one account is active
```

The `__len__` and `__bool__` methods allow developers to work with objects in a more Pythonic manner.

⭐ Proceed to the next step ⭐

✓ Validations

○ On-Track - Ensure The Account / Accounts Classes Are Fully Implemented

1. Ensure that you're on-track.

Python

Report an issue

④ Demonstrate Your Knowledge ✓ 0/1

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