

Lecture 12: Object Symbol tables (continued)

New idea

Objects have their own Symbol tables!

```
1  '''lecture_11_turtle_object_symbol_table.py
2  Create 2 Turtle objects and a Screen object. Change a few properties of each object.
3  Oliver W. Layton
4  CS 151: Computational Thinking: Visual Media
5  Fall 2020
6  '''
7  import turtle
8
9
10 def goto(turt, x, y):
11     turt.goto(x, y)
12
13
14 def make_turtle(shape='turtle', penColor='white'):
15     turt = turtle.Turtle(shape=shape)
16     turt.color(penColor)
17     return turt
18
19
20 w = 1000
21 h = 800
22 screen = turtle.Screen()
23 screen.setup(width=w, height=h)
24
25 t1 = make_turtle()
26 t2 = make_turtle(shape='arrow', penColor='black')
27 t1.color('red')
28
29 goto(t1, 10, 10)
30
31 screen.exitonclick()
32
```

Constructor

Main

Name	Type	Value
turtle	module	→
goto	fun	→
make_turtle	fun	→
w	int	1000
h	int	800
Screen	Object	

turtle

Name	type	Value
forward	fun	→
right	fun	→
Screen	fun	→

return

Name	type	Value
width	int	
height	int	
bgcolor	str	

Name	type	Value
Screen	Object	

line 22: Call Screen constructor — fancy name for function.

Screen = turtle.Screen()

end line 22

Main

<u>Name</u>	<u>Type</u>	<u>Value</u>
turtle	module	→
goto	fun	→
make_turtle	fun	→
w	int	1000
h	int	800
Screen	Object	

Screen Object

<u>Name</u>	<u>type</u>	<u>Value</u>
width	int	1000
height	int	800
bgcolor	str	

Setup fun →

⋮

line 23:

Screen.set-up(w, h)

Screen.set-up(1000, 800)

look up in main

~~Screen.set-up~~

<u>Name</u>	<u>type</u>	<u>Value</u>
width	int	<u>1000</u>
height	int	<u>800</u>

⇒ make function Symbol table

⇒ Finish line 23

Main

<u>Name</u>	<u>Type</u>	<u>Value</u>
turtle	module	→
goto	fun	→
make_turtle	fun	
w	int	1000
h	int	800
Screen	Object	
t1	Object	

Screen Object

<u>Name</u>	<u>type</u>	<u>Value</u>
width	int	1000
height	int	800
bgcolor	str	
Setup	fun	→
⋮		

1000
800

~~make_turtle~~

<u>Name</u>	<u>type</u>	<u>Value</u>
Shape	str	'turtle'
penColor	str	'white'
turt	Object	

t1

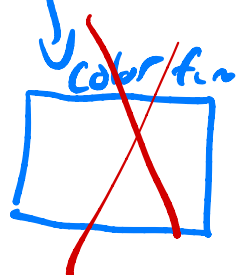
<u>Name</u>	<u>type</u>	<u>Value</u>
Color	str	'black' → 'white'
penwidth	int	1
x	int	0
y	int	0
Shape	str	'turtle'
Color	fun	

line 25: t1 = make_turtle()

⇒ line 15: make turtle object: 'turtle'

turt = turtle.Turtle (Shape = Shape)

⇒ turt.color (penColor)



line 17: return t1

go back to main code line 25.

$t1 = \text{make_turtle}()$ → create $t1$ in main table,
draw arrow to turtle object

finish this line

} skip some steps

Move to line 27.

Main

Name	Type	Value
turtle	module	→
goto	fun	→
make_turtle	fun	
w	int	1000
h	int	800
Screen	Object	
t1	Object	
t2	Object	

Screen Object

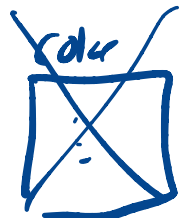
Name	type	Value
width	int	1000
height	int	800
bgcolor	str	
Setup	fun	→
...		

t2 Object

Name	type	Value
color	str	'black'
...		
Shape	str	'arrow'

t1 Object

Name	type	Value
color	str	'black' → 'white' → 'red'
penwidth	int	1
x	int	0
y	int	0
Shape	str	'turtle'
Color	fun	



tl.color('red')