

```
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
```

Main

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

Screen Object

f1 object
f2 object

+2		
Turtle object		
...		crow
		'black'
x	int	0
y	int	0

Screen Object

Name	Value	type
width	1000	int
height	800	int
exitonclick	→	fun

Turtle object

Name	Type	Value
Shape	str	'turtle'
Color	fun	→
goto	fun	→
pencolor	str	'red'
x	int	10
y	int	10

line 29: goto(+1, 10, 10)

line 11: turt.goto(x, y)

f1.goto		
<u>Name</u>	<u>type</u>	<u>value</u>
x	int	10
y	int	10

Go to (line 10)

Name	type	Value
turt	object	→
x	int	10
y	int	10

line 11 ends

Back to main code line 29 ends.

main

Name	Type	Value
------	------	-------

turtle	module	→
--------	--------	---

goto	fun	→
------	-----	---

make_turtle	fun	→
-------------	-----	---

w	int	1000
---	-----	------

h	int	800
---	-----	-----

Screen Object

f1 object

f2 object

+2

Turtle object

... crow
black

Screen Object

Name	Value	type
------	-------	------

width	1000	int
-------	------	-----

height	800	int
--------	-----	-----

exitonclick	→	fun
-------------	---	-----

Turtle object

Name	Type	Value
------	------	-------

Shape	Str	'turtle'
-------	-----	----------

Color	fun	→
-------	-----	---

goto	fun	→
------	-----	---

penColor	Str	'red'
----------	-----	-------

x	int	10
---	-----	----

y	int	10
---	-----	----

line 29: goto(+1, 10, 10)

line 11: turt.goto(x, y)

f1.goto

Name	type	Value
------	------	-------

x	int	10
---	-----	----

go to (line 10)

Name	type	Value
------	------	-------

turt	object	→
------	--------	---

x	int	10
---	-----	----

y	int	10
---	-----	----

Shallow copy

turt1.Turtle()

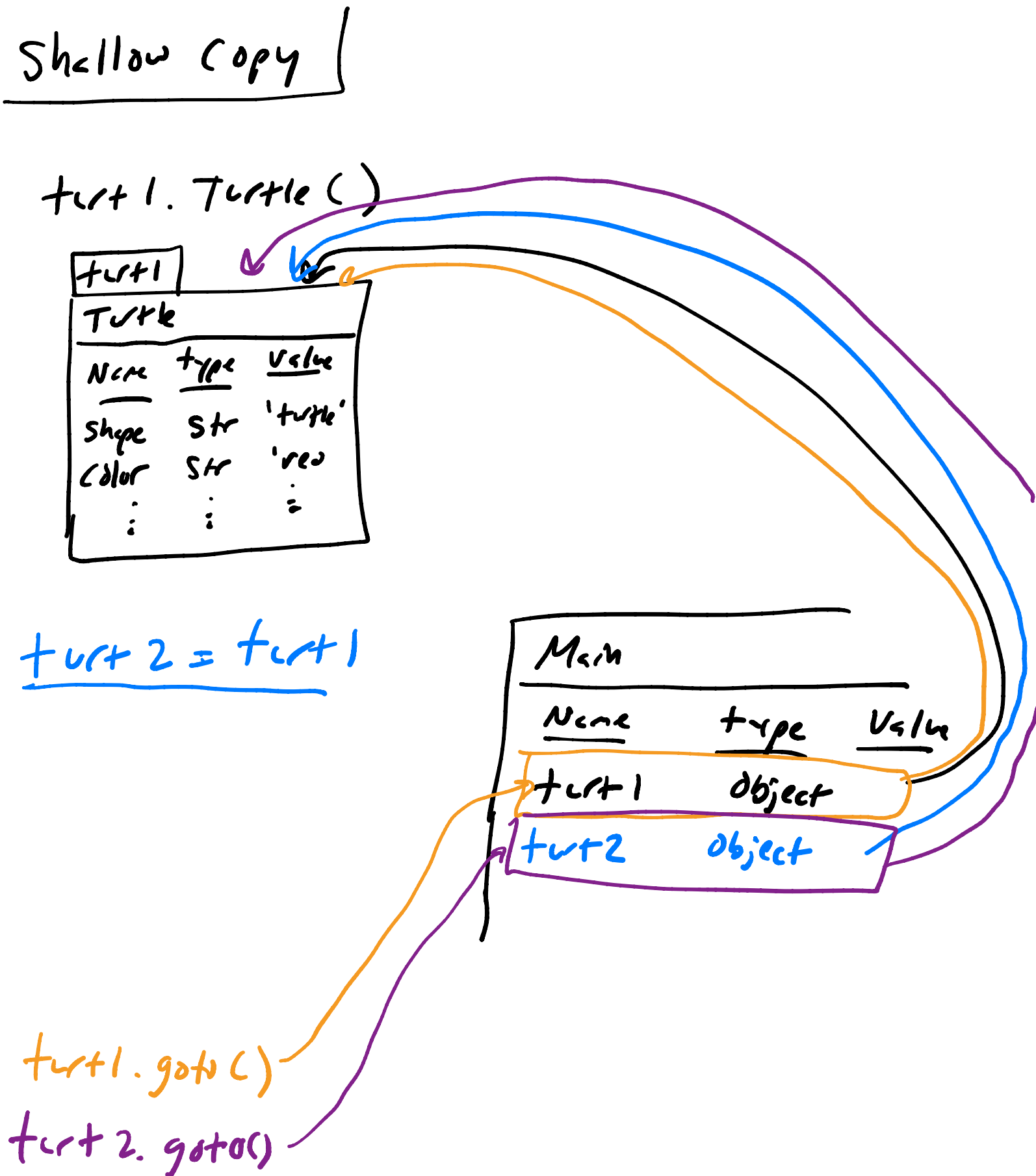
turt1		
Turtle		
<u>Name</u>	<u>type</u>	<u>Value</u>
Shape	Str	'turtle'
Color	Str	'red'
:	:	:

turt2 = turt1

Main		
<u>Name</u>	<u>type</u>	<u>Value</u>
turt1	object	
turt2	object	

turt1.goto()

turt2.goto()



Deep copy

turt1. Turtle()

turt1		
Turtle		
<u>Name</u>	<u>type</u>	<u>Value</u>
Shape	Str	'turtle'
Color	Str	'red'
clone	fun	→

Turtle		
<u>Name</u>	<u>type</u>	<u>Value</u>
Shape	Str	'turtle'
Color	Str	'red'
clone	fun	→

'blue'

turt2 = turt1.clone()

Main		
<u>Name</u>	<u>type</u>	<u>Value</u>
turt1	object	
turt2	object	

turt2.color('blue')

