

CSE 20 11-4-21

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- ✓ • Quiz 3 Solns Posted
 - ✓ • Lab 4: closed
 - ✓ • P45: ext. to Saturday
 - ✓ • P46: soon

Chap 12: Tuples

a tuple is an immutable list.

EX.

$$T = (\overset{0}{\text{'one'}}, \overset{1}{\text{'two'}}, \overset{2}{5.5}, \overset{3}{[\overset{0}{3}, \overset{1}{\text{'foo'}}]})$$

Access via indices

$T[0] \neq \text{'one'}$

$\text{len}(T) \neq 4$

$T[3] \neq [3, \text{'foo'}]$

$T[-1] \neq \text{same}$

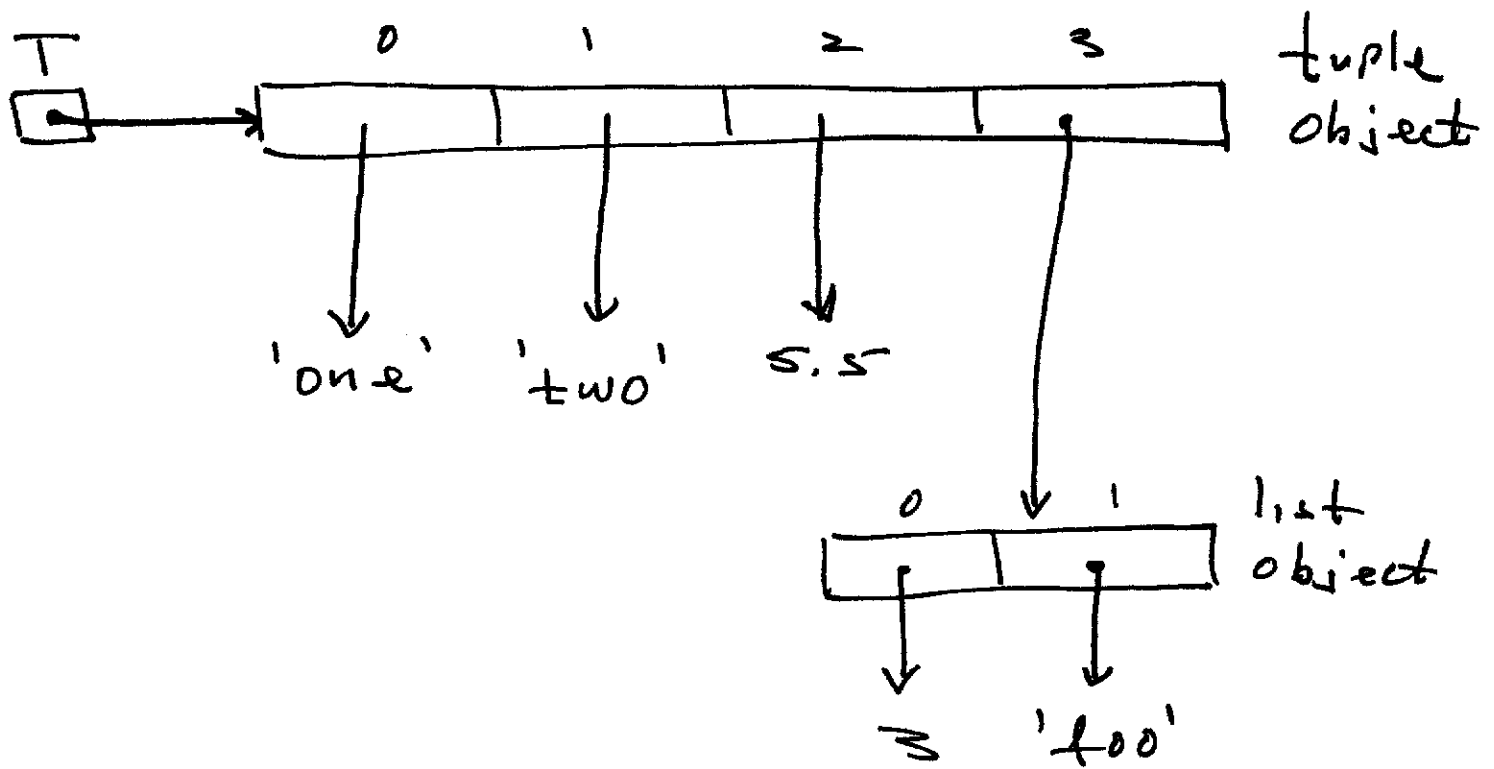
$T[-2] \neq 5.5$

$T[:2] \neq (\text{'one'}, \text{'two'})$

difference: cannot assign new values to the elements of T .

$T[0] = \text{'three'} \neq \text{error}$

Picture:



`T[3][0] # 3`

`T[3][1] # 'foo'`

Note: we can put variables into tuples (and lists)

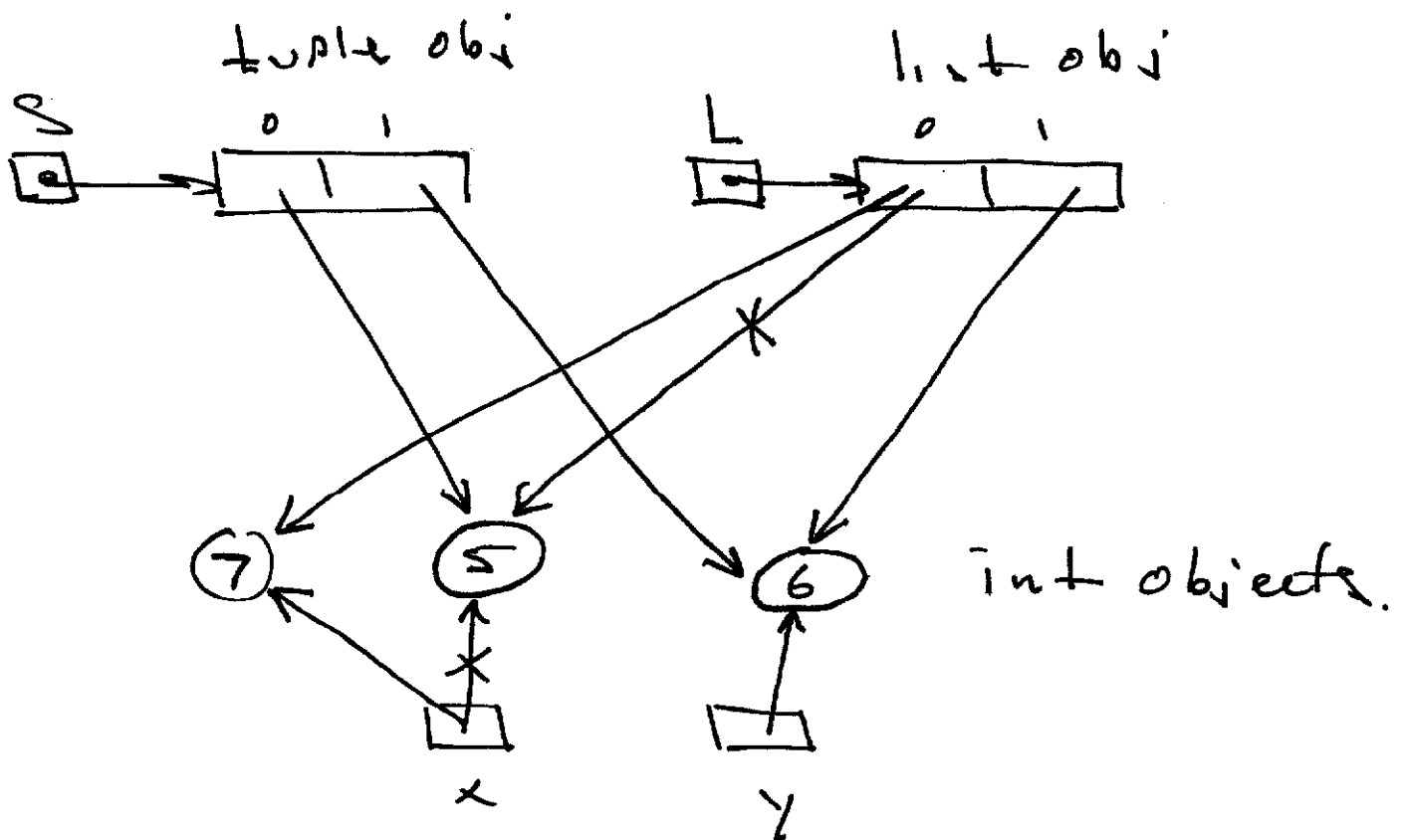
Ex

$$x = 5$$

$$y = 6$$

$$S = (x, y)$$

$$L = [x, y]$$

Picture:

$$x = 7 \quad \# \text{ok}$$

$$L[0] = 7 \quad \# \text{ok}$$

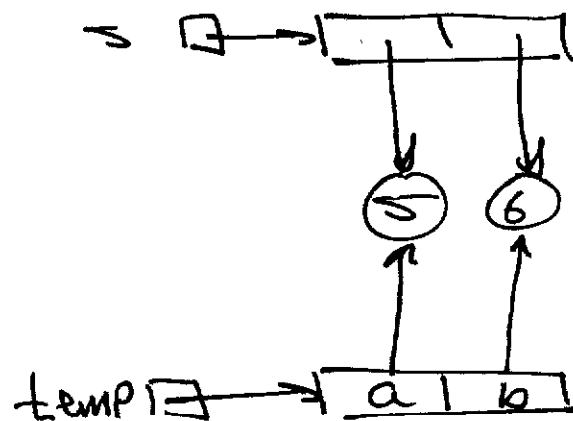
$$S[0] = 7 \quad \# \text{error}$$

L.append(9) ~~not~~ OK

S.append(9) ~~not~~ error

we can make variable assignments using tuples.

(a, b) = S

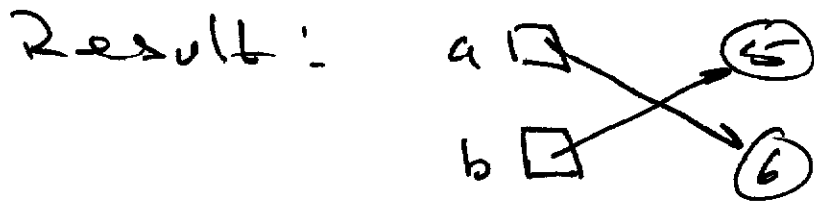


Result: a → 5

b → 6

an easy way to swap:

$$(a, b) = (b, a)$$



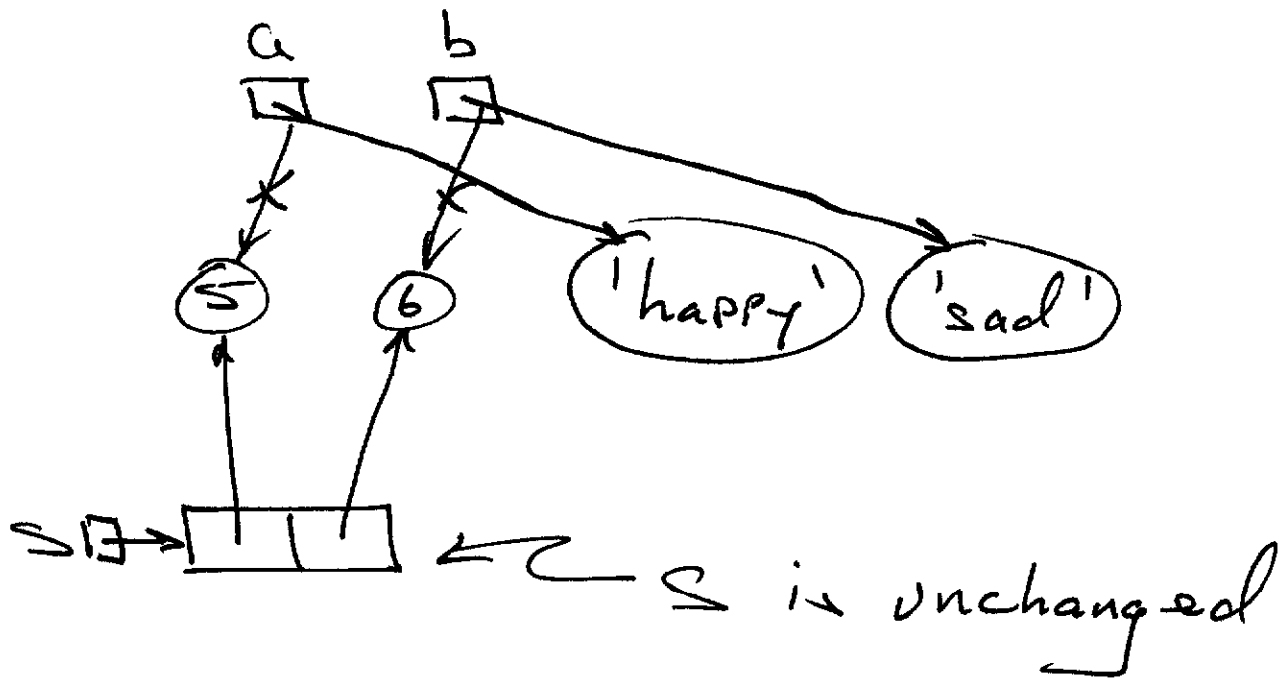
same thing:

$$a, b = b, a$$

Recall we did:

$$\left\{ \begin{array}{l} \text{temp} = a \\ a = b \\ b = \text{temp} \end{array} \right.$$

again: $a, b = \text{'happy'}, \text{'sad'}$



EX, Circle4.py (returns tuple)

Built-in fn: `sum()`

- `sum([....])`
- `sum((.....))`
- `sum(range(...))`
- `sum(string? )` # no!!

Read: chap 13 : word frequency
will be useful practice for Pa6 .

Read chap 14 : files

sec. 14.9 Modules

A module is a file that ends
in .py

for example

- random ..
- time ...
- create new modules .

Ex. Dice.py uses random

`rng.randrange(a, b+1)`

and

`rng.randint(a, b)`

do same thing, i.e. return
a random int x in $a \leq x \leq b$

Also change step:

`y = rng.randrange(a, b, c)`
 ↑ ↑ ↑
 start stop step
 (exclusive)

first die

1 2 3 4 5 6

second

die

1	11	12	13	14	15	16
2	21	22	23	24	25	26
3	31	32	33	34	35	36
4	41	42	43	44	45	46
5	51	52	53	54	55	56
6	61	62	63	64	65	66

Sum $\Rightarrow$ 7 8 9 10 11 12

$$P_{ob}(sum=10) = \frac{3}{36} = \frac{1}{12}$$

Ex. RandomInte 1. by
2

See time module in
Python docs.

Ex Time.Py

How to create a new module:

Ex Matrix.Py

MatrixTest.Py