



Basic Programming

Lesson 11-12

Collections

Collection Object

An object that contains other objects and allows object retrieval.

Standard Python Collection Types

```
>>> l = [1,2,3,4,144,42]
>>> l[0]
1
>>> l[5]
42
```

list

A mutable, ordered
collection of objects
retrievable by index

```
>>> d = {1: 3,2: 7,5: 42}
>>> d[1]
3
>>> d[5]
42
```

dict

A mutable, unordered
collection of objects
retrievable by key

Collection Classification

Sequence Type

list

A mutable collection of
values retrievable by index

Mapping Type

dict

A mutable collection of
values retrievable by a key

Sequence Type

A collection where contained objects are retrievable by their index. The object can report the number of contained objects (i.e. `length`).

Other Sequence Types

tuple

range

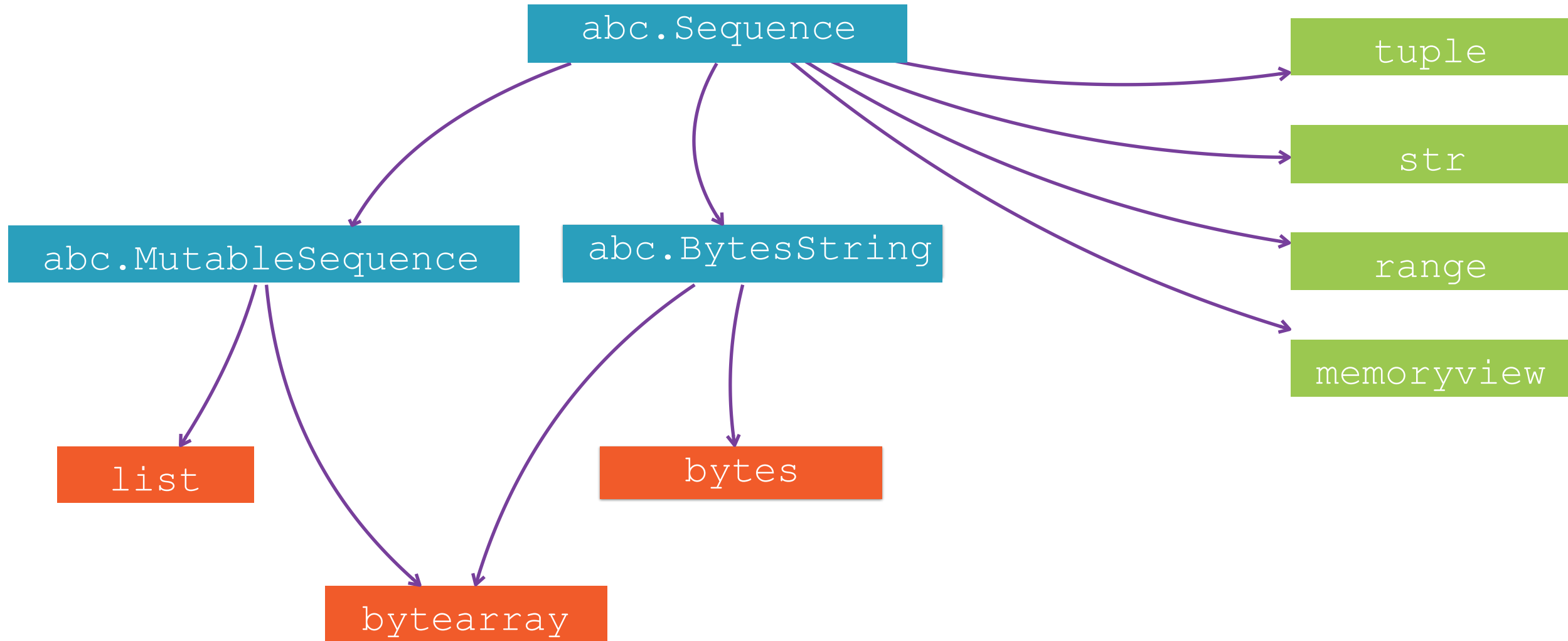
bytes

bytearray

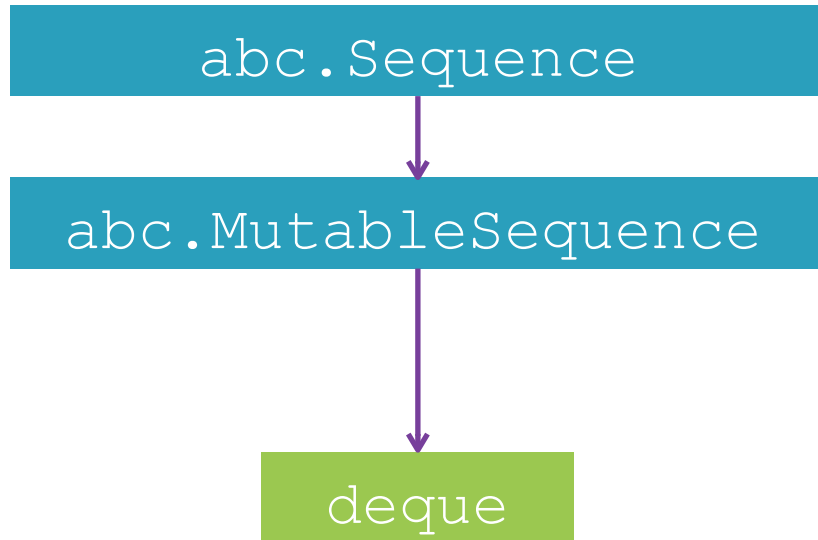
memoryview

str

Base Classes: collections.abc



deque



“Double-ended Queue”

Can be used as a Queue and/or Stack

Can add or remove items from both “ends” Can
limit number of items (maxlen)

If set deque discards objects when maxlen is hit

Stack Data structure

Last In First Out
LIFO

object

push

object

object

object

pop

First In First Out
FIFO

Queue Data structure



object

enqueue

object

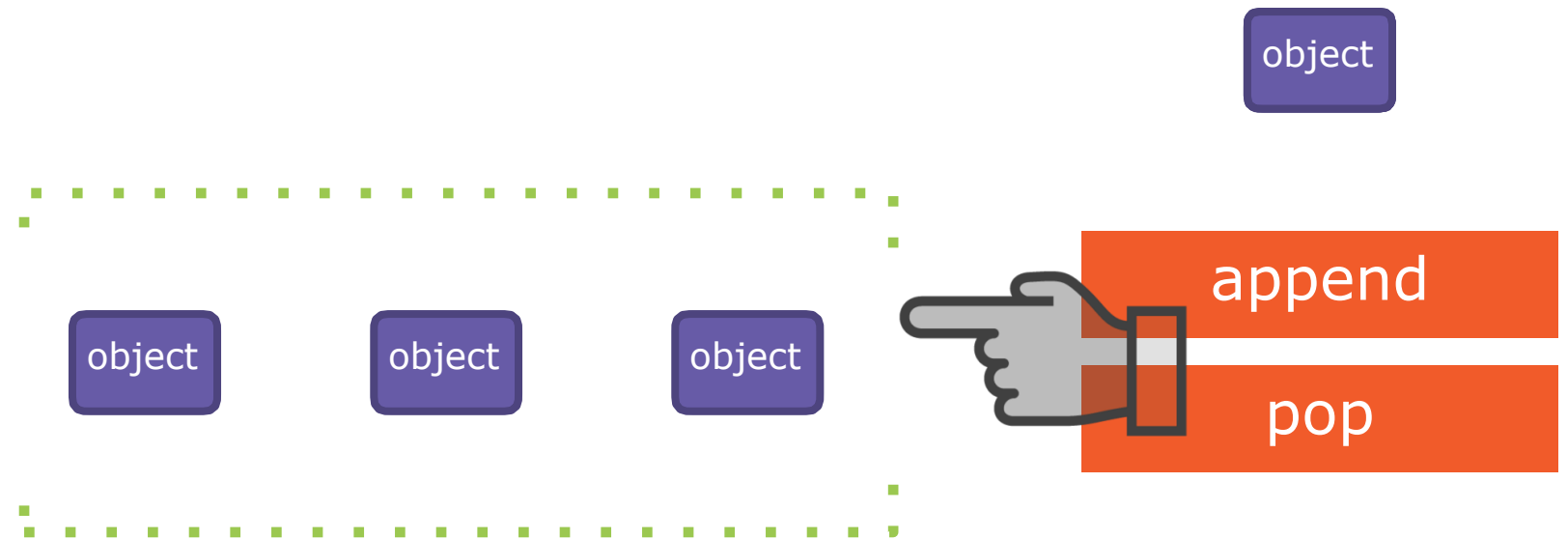
object

object

dequeue

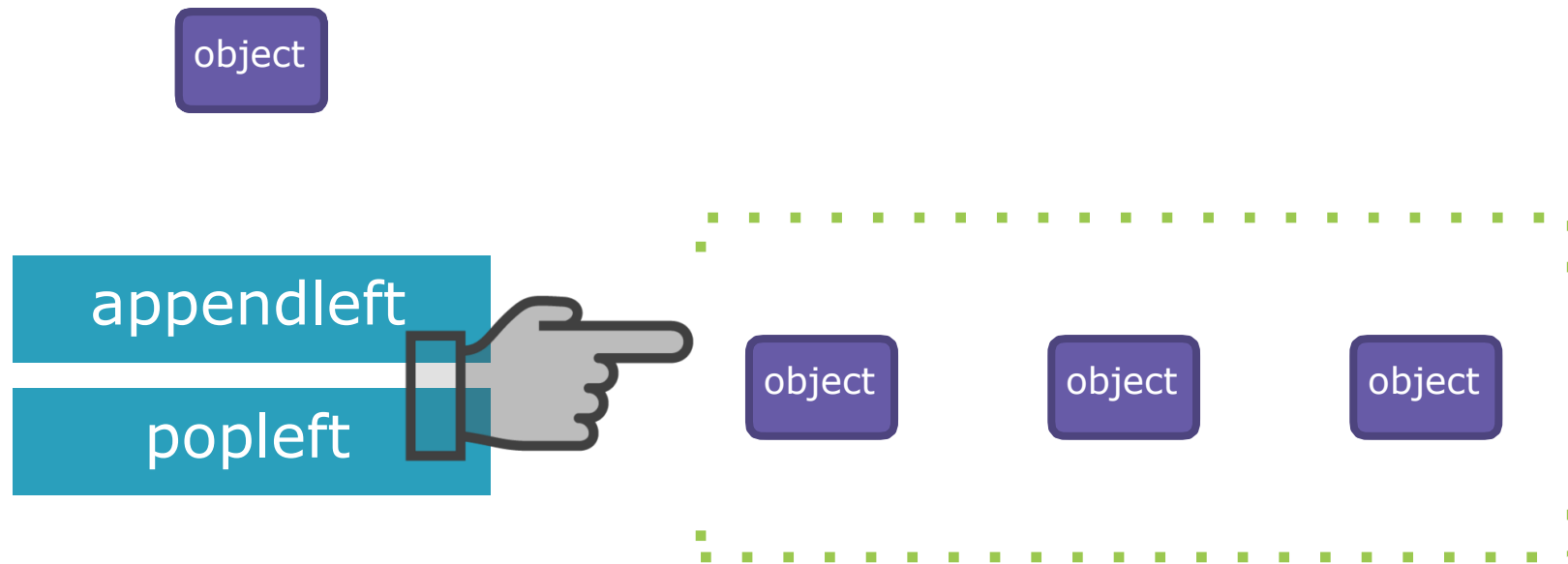
deque

Last In First Out
LIFO



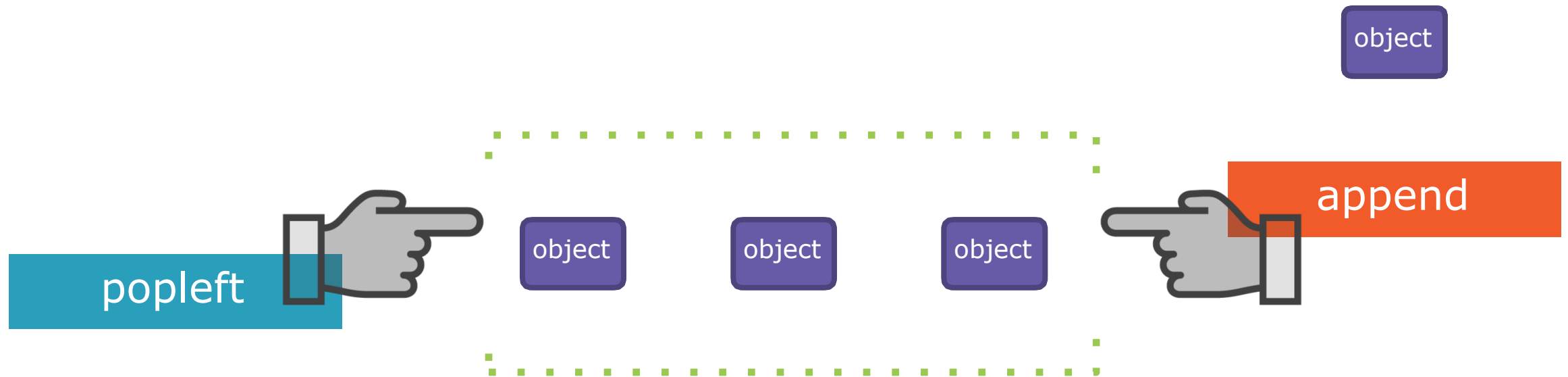
deque

Last In First Out
LIFO



First In First Out
FIFO

deque



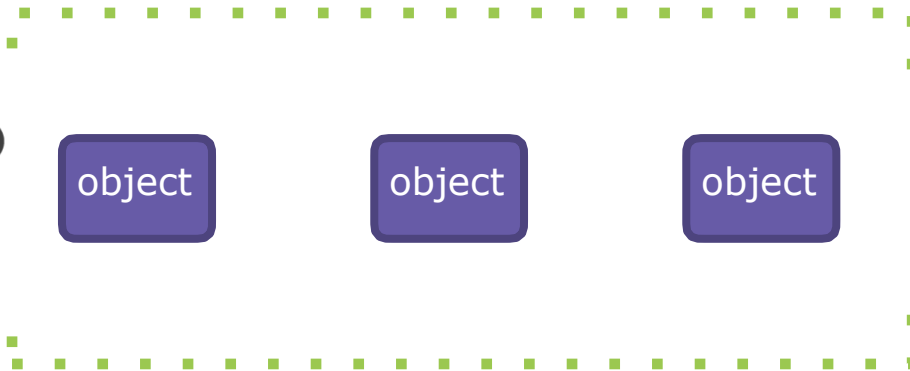
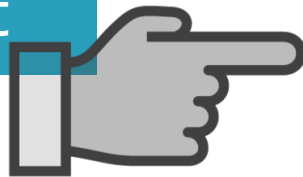
First In First Out
FIFO

deque



object

appendleft



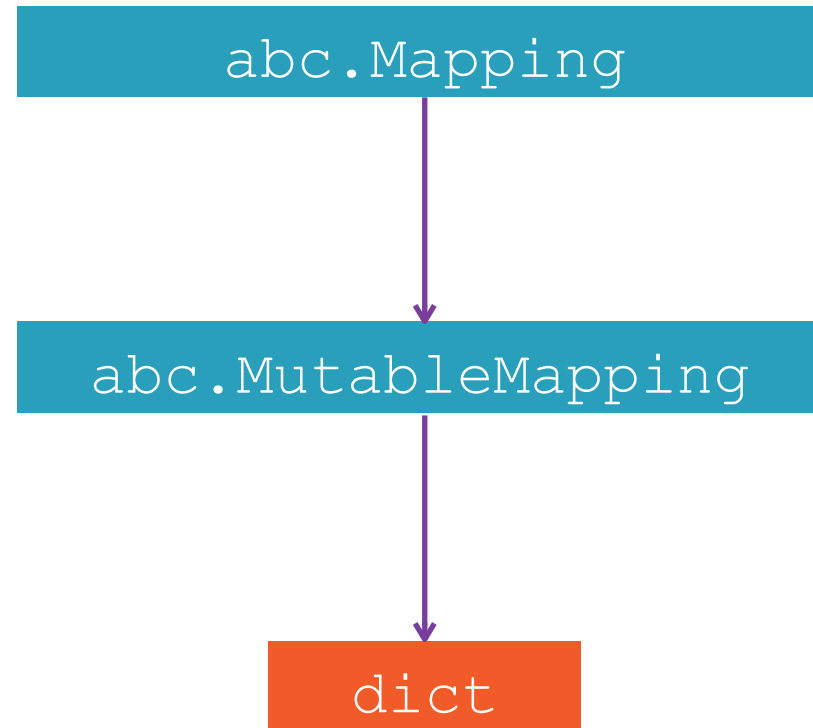
pop



Mapping Type

A collection where contained objects are stored with and retrieved via a key.

Base Classes: collections.abc



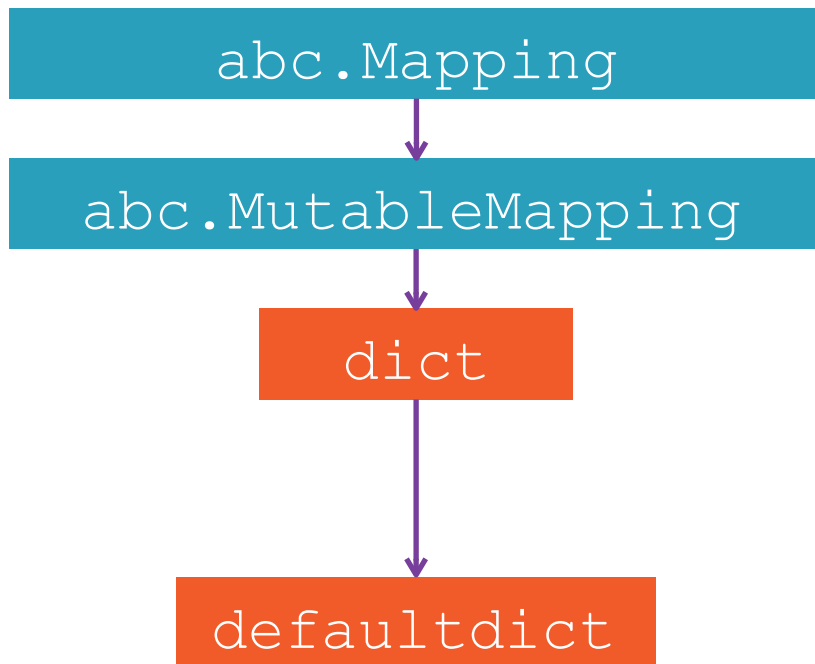
Additional Mapping Types

defaultdict

Counter

~~OrderedDict~~

defaultdict



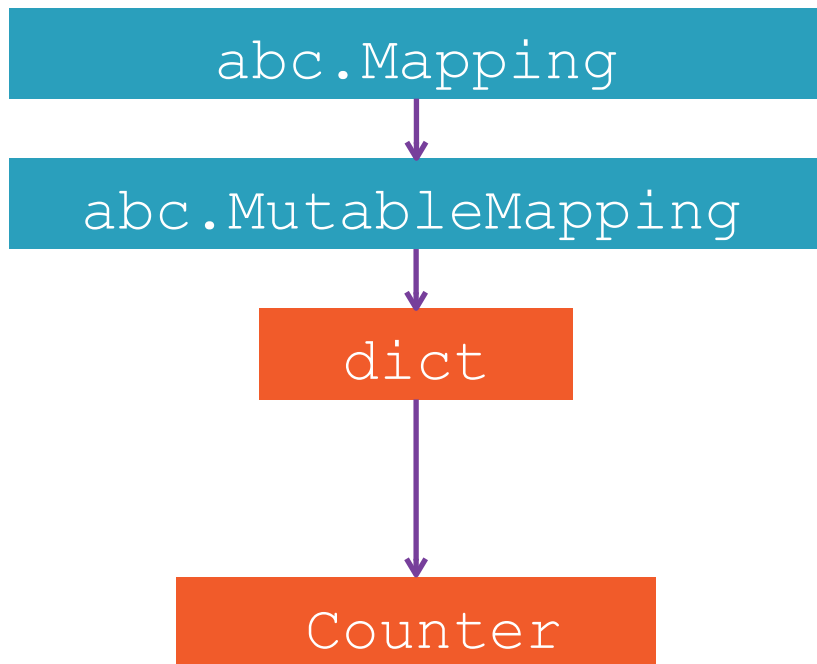
Single default value type

You provide type/function

If key doesn't exist, function is called No KeyError

Useful when aggregating data

Counter



Not a general use Mapping type

Value for each key is always an int

Automatically creates count from sequence

most_common is significant

Known as bag or Multiset in other languages