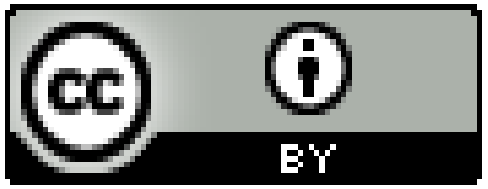
Python

Slicing



Lists, strings, and tuples are all *sequences*

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Can be indexed by integers in the range 0…len(X)-1

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Can also be *sliced* using a range of indices

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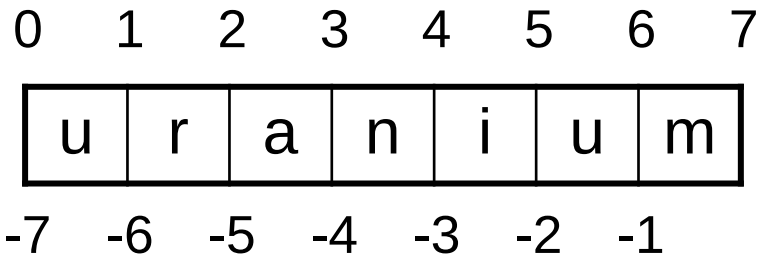
```
>>> element = 'uranium'
>>>
```



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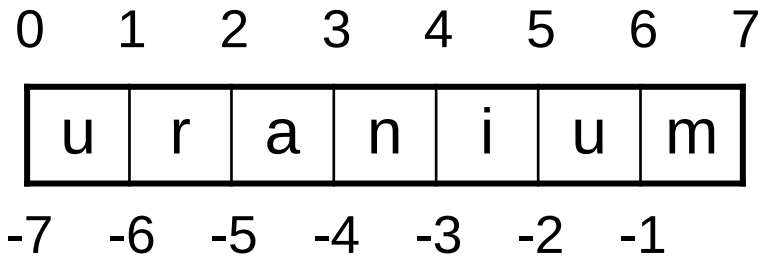
Can be indexed by integers in the range 0…len(X)-1

Can also be *sliced* using a range of indices

```
>>> element = 'uranium'
>>> print element[1:4]
ran
>>>
```



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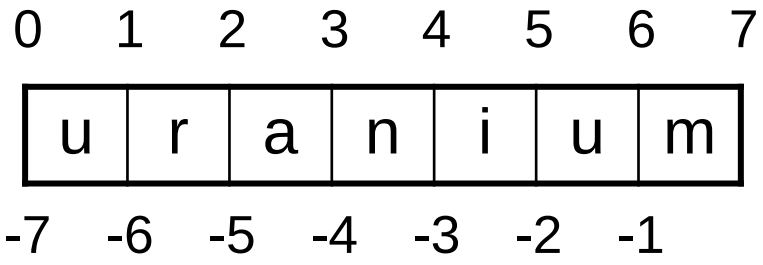
Can be indexed by integers in the range 0…len(X)-1

Can also be *sliced* using a range of indices

```
>>> element = 'uranium'
>>> print element[1:4]
ran
>>> print element[:4]
uran
>>>
```



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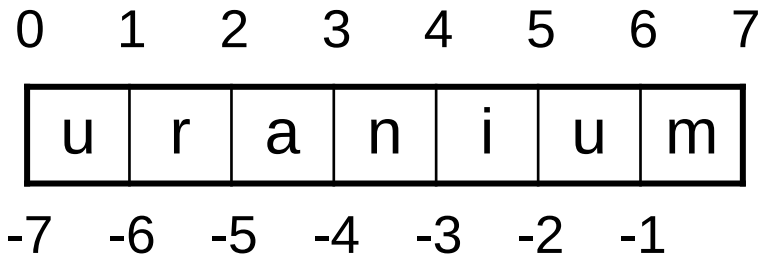
Can also be *sliced* using a range of indices

```
>>> element = 'uranium'
>>> print element[1:4]
ran
>>> print element[:4]
uran
>>> print element[4:]
ium
>>>
```

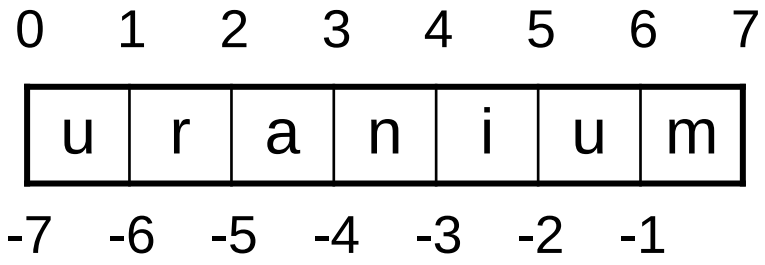


Lists, strings, and tuples are all *sequences*

Can be indexed by integers in the range 0…len(X)-1

Can also be *sliced* using a range of indices

```
>>> element = 'uranium'
>>> print element[1:4]
ran
>>> print element[:4]
uran
>>> print element[4:]
ium
>>> print element[-4:]
nium
>>>
```



Python checks bounds when indexing

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But truncates when slicing

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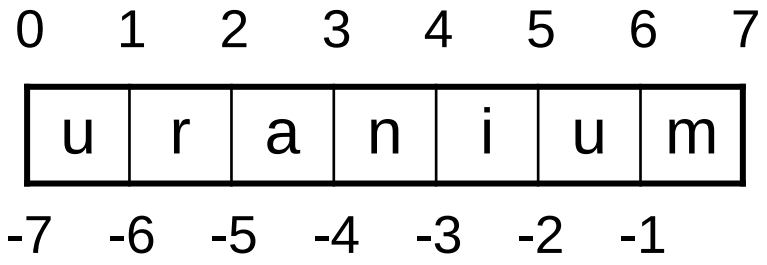
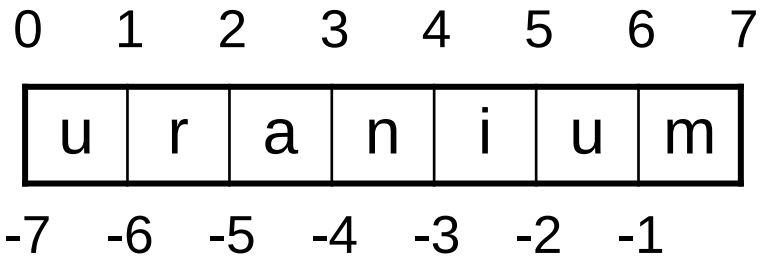
```
>>> element = 'uranium'
>>>
```



Python checks bounds when indexing

But truncates when slicing

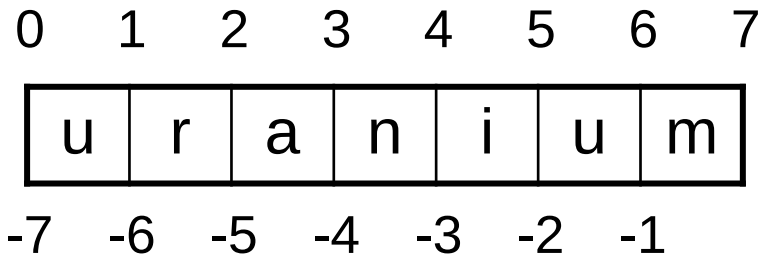
```
>>> element = 'uranium'
>>> print element[400]
IndexError: string index out of range
>>>
```



Python checks bounds when indexing

But truncates when slicing

```
>>> element = 'uranium'
>>> print element[400]
IndexError: string index out of range
>>> print element[1:400]
ranium
>>>
```



So text[1:3] is 0, 1, or 2 characters long

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''	''
'a'	''
'ab'	'b'
'abc'	'bc'
'abcdef'	'bc'

Slicing always creates a new collection

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Beware of aliasing

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```
>>> points = [[10, 10], [20, 20], [30, 30], [40, 40]]
>>>
```

Slicing always creates a new collection

Beware of aliasing

```
>>> points = [[10, 10], [20, 20], [30, 30], [40, 40]]
>>> middle = points[1:-1]
>>>
```

Slicing always creates a new collection

Beware of aliasing

```
>>> points = [[10, 10], [20, 20], [30, 30], [40, 40]]
>>> middle = points[1:-1]
>>> middle[0][0] = 'whoops'
>>>
```

Slicing always creates a new collection

Beware of aliasing

```
>>> points = [[10, 10], [20, 20], [30, 30], [40, 40]]
>>> middle = points[1:-1]
>>> middle[0][0] = 'whoops'
>>> middle[1][0] = 'aliasing'
>>>
```

Slicing always creates a new collection

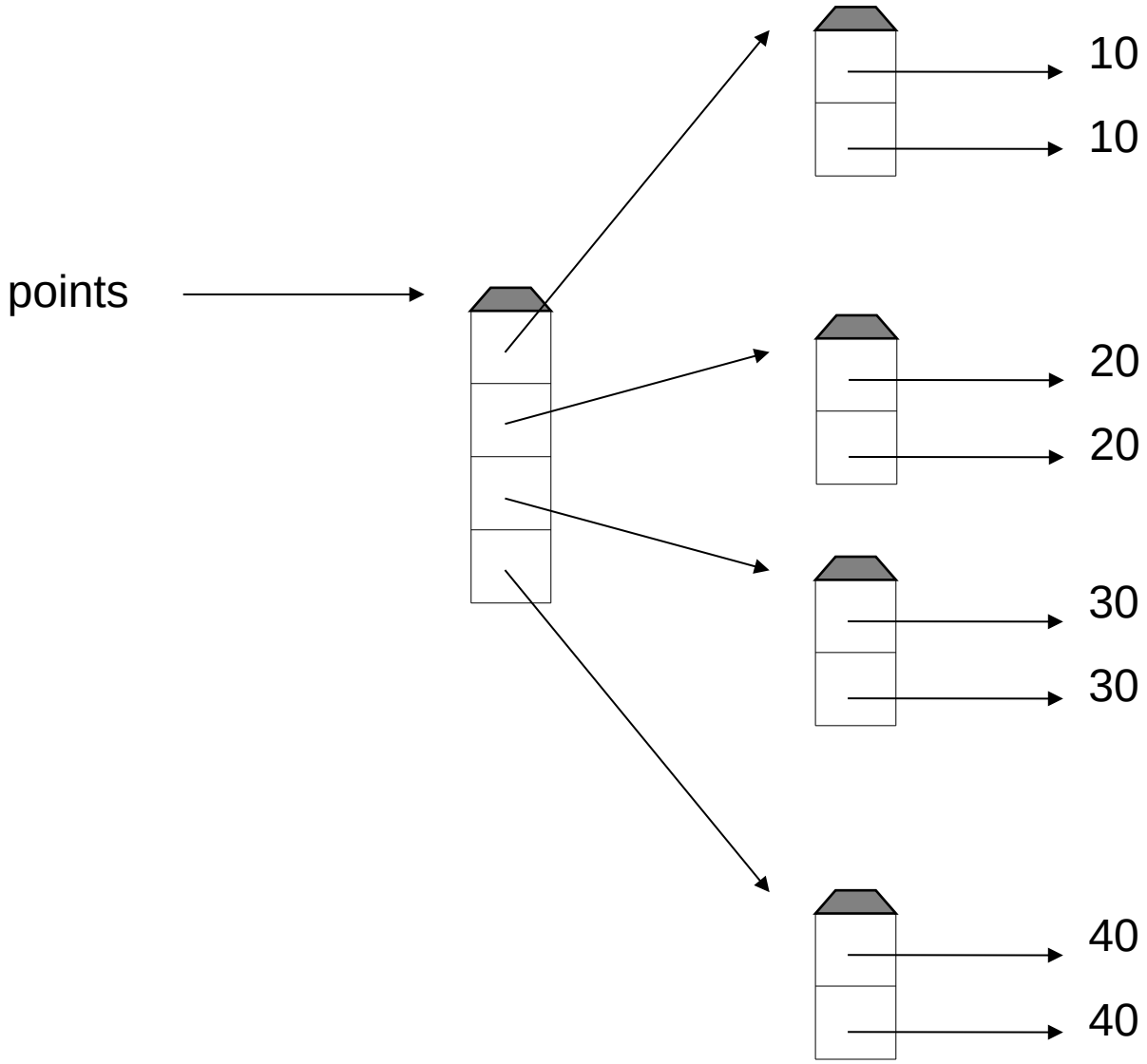
Beware of aliasing

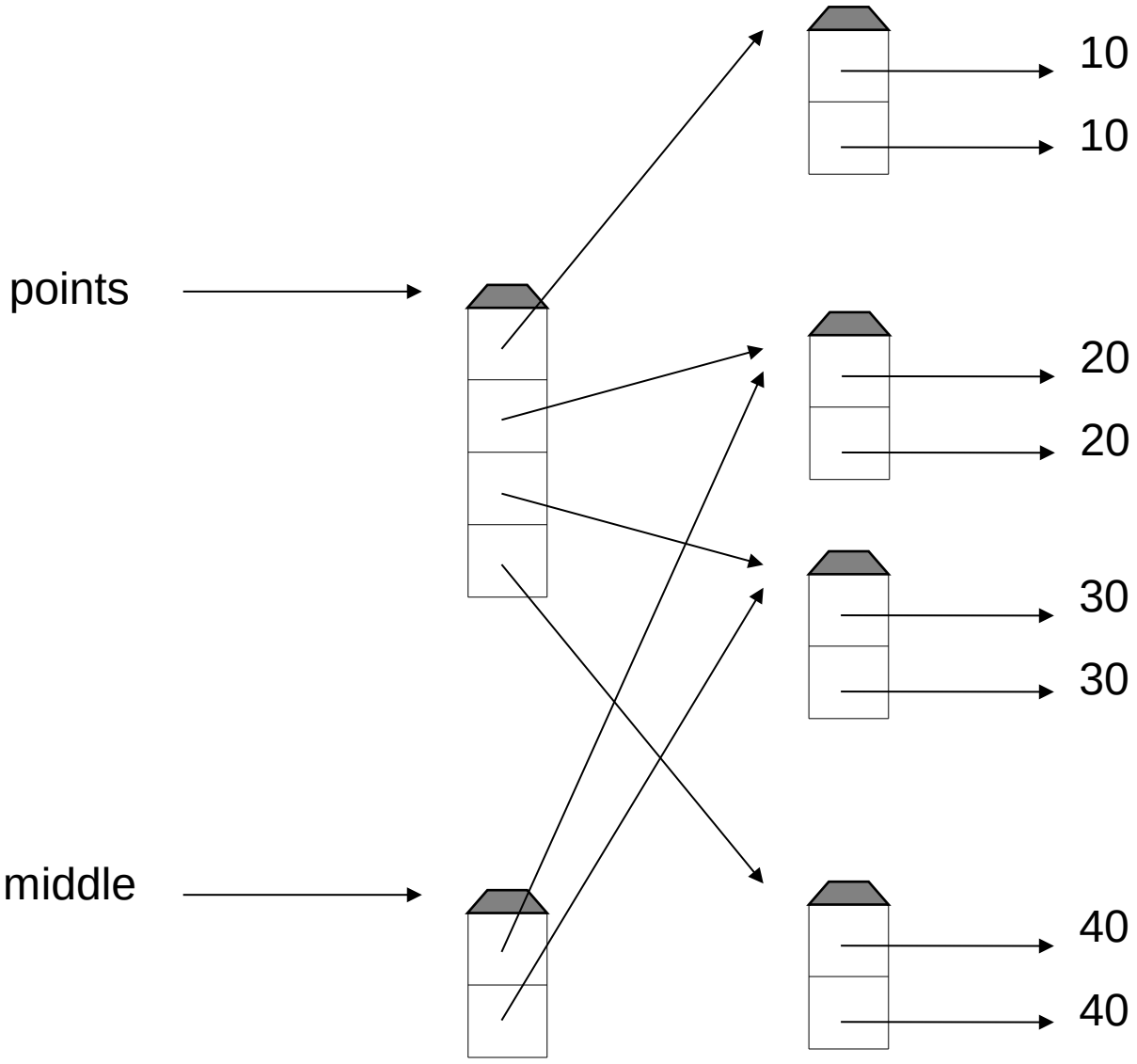
```
>>> points = [[10, 10], [20, 20], [30, 30], [40, 40]]
>>> middle = points[1:-1]
>>> middle[0][0] = 'whoops'
>>> middle[1][0] = 'aliasing'
>>> print middle
[['whoops', 20], ['aliasing', 30]]
>>>
```

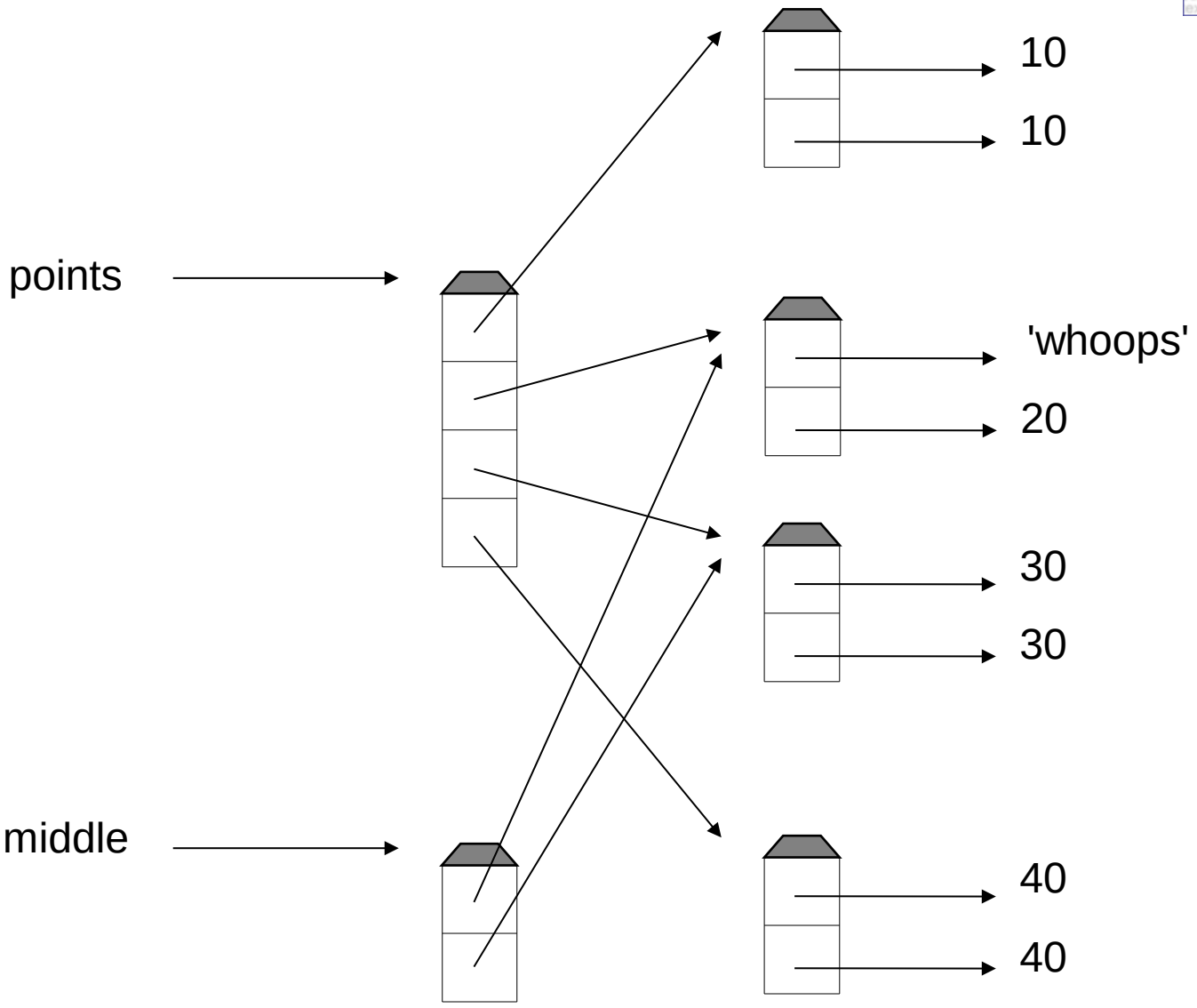
Slicing always creates a new collection

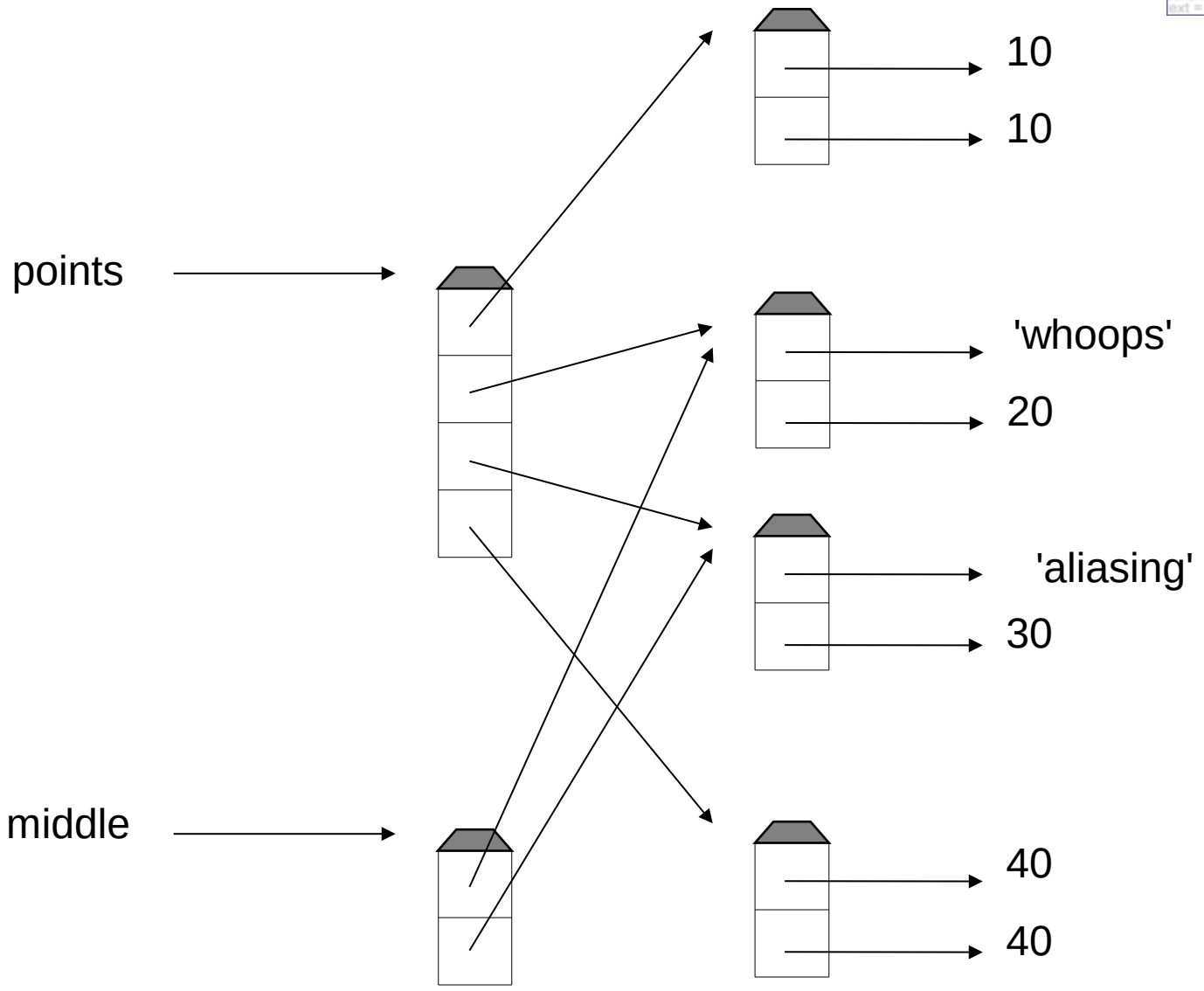
Beware of aliasing

```
>>> points = [[10, 10], [20, 20], [30, 30], [40, 40]]
>>> middle = points[1:-1]
>>> middle[0][0] = 'whoops'
>>> middle[1][0] = 'aliasing'
>>> print middle
[['whoops', 20], ['aliasing', 30]]
>>> print points
[[10, 10], ['whoops', 20], ['aliasing', 30], [40, 40]]
>>>
```


points
10
10
20
20
30
30
40
40


points
middle
10
10
20
20
30
30
40
40


points
middle
10
10
'whoops'
20
30
30
40
40


points
middle
10
10
'whoops'
20
'aliasing'
30
40
40

created by

Greg Wilson

October 2010