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Python

Slicing

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

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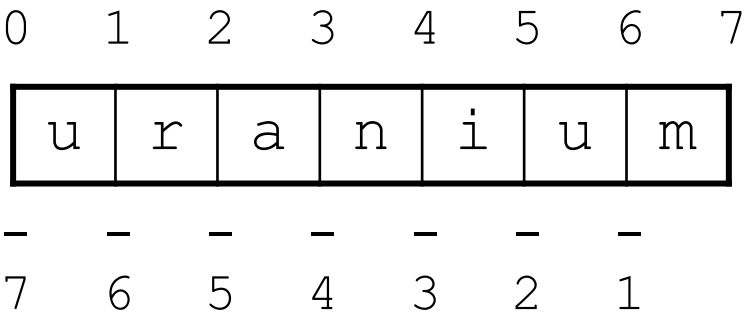
```
>>> element = 'uranium'
>>>
```



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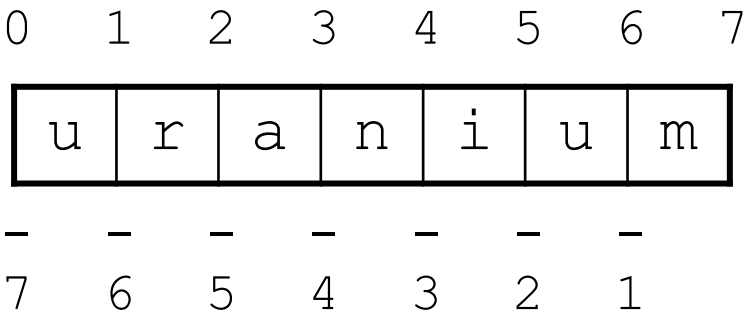
Can also be *sliced* using a range of indices

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



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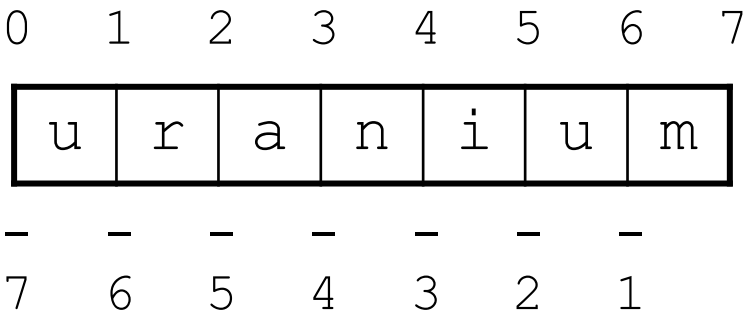
```
>>> element = 'uranium'
>>> print(element[1:4])
ran
>>> print(element[:4])
uran
>>>
```



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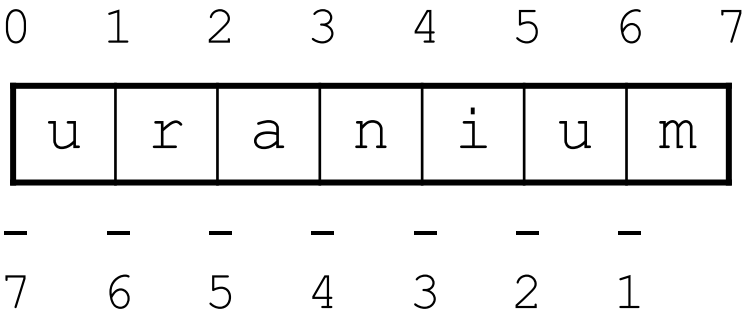
>>> element = 'uranium'
>>> print(element[1:4])
ran
>>> print(element[:4])
uran
>>> print(element[4:])
ium
>>>
```



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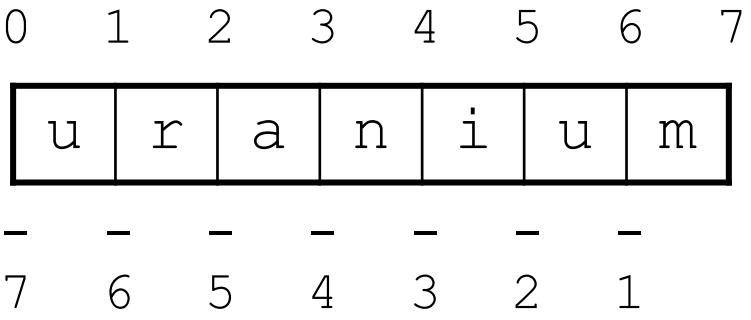
Can also be *sliced* using a range of indices

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



Python checks bounds when indexing

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But truncates when slicing

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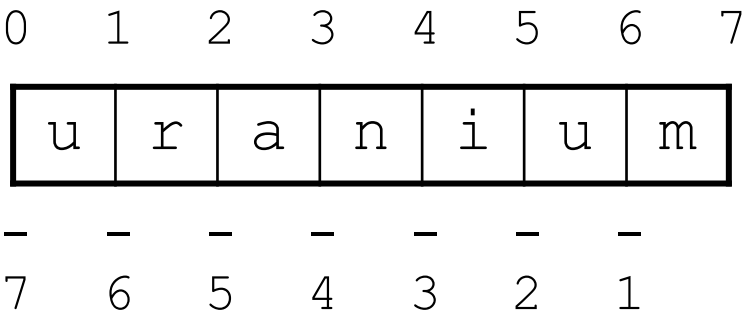
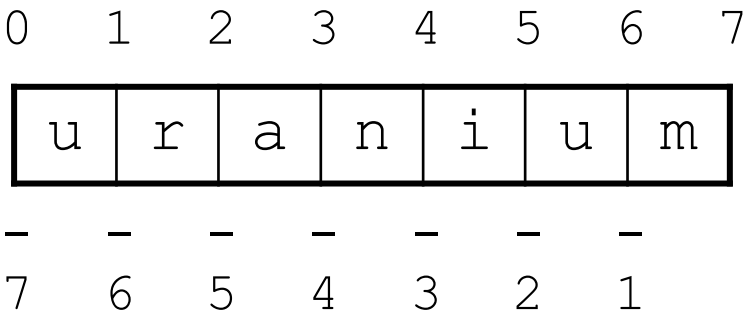
```
>>> element = 'uranium'
>>>
```



Python checks bounds when indexing

But truncates when slicing

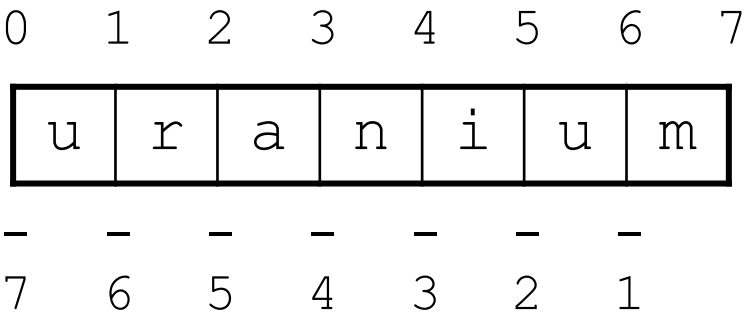
```
>>> element = 'uranium'
>>> print(element[400])
IndexError: string index out of range
>>>
```



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]]
>>>
```

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```
>>> 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]]
>>>
```

STOP HERE


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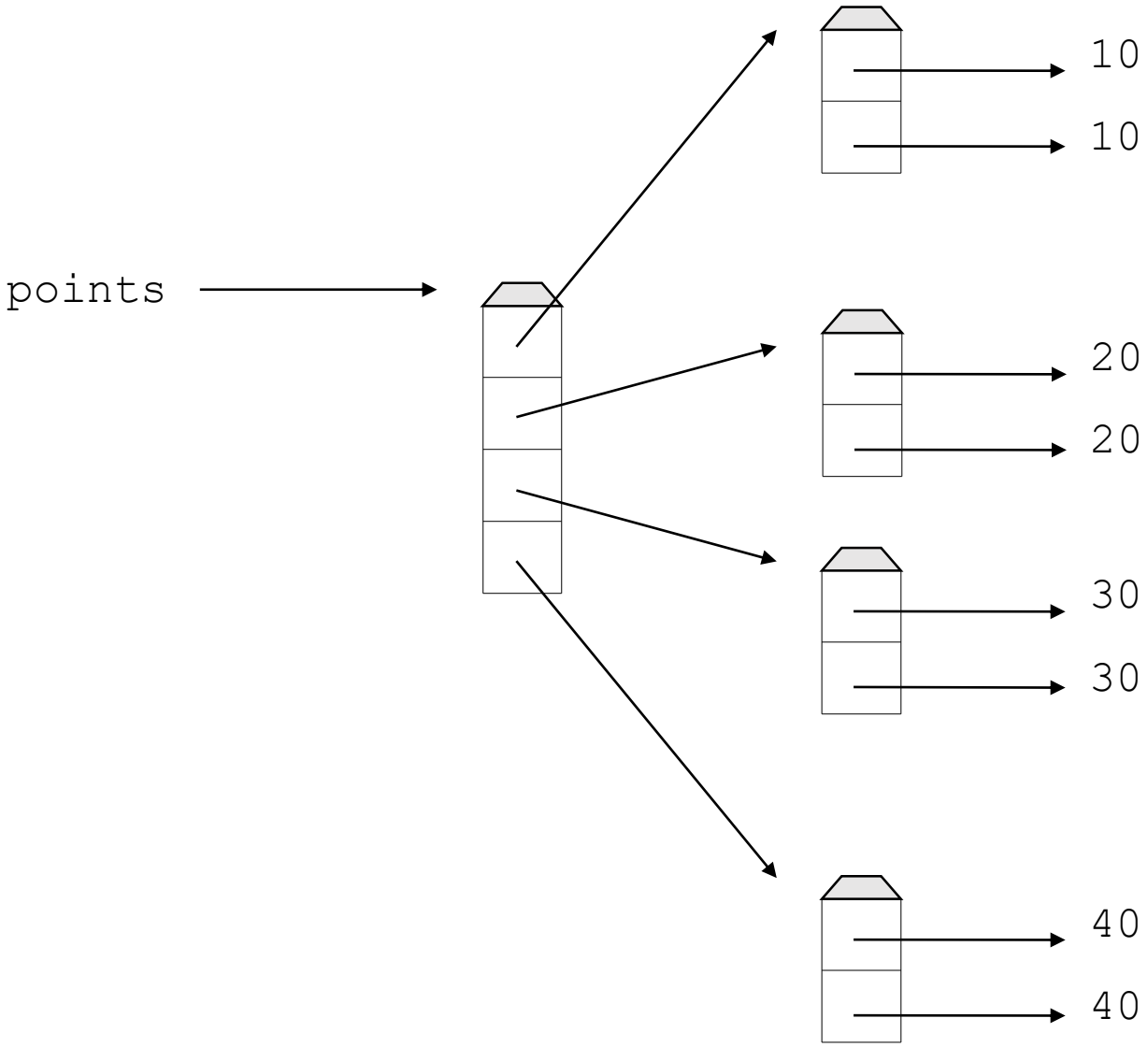
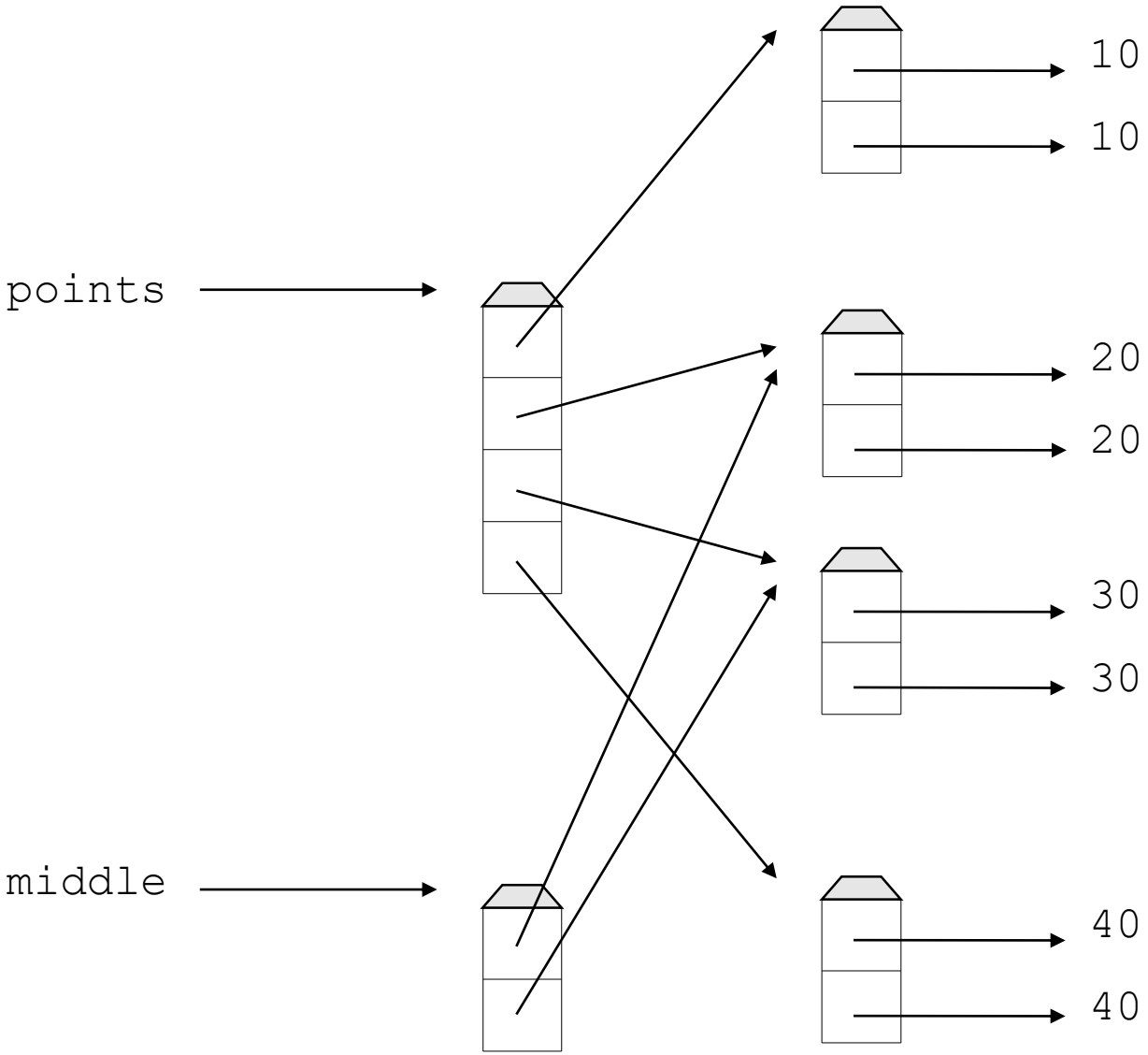
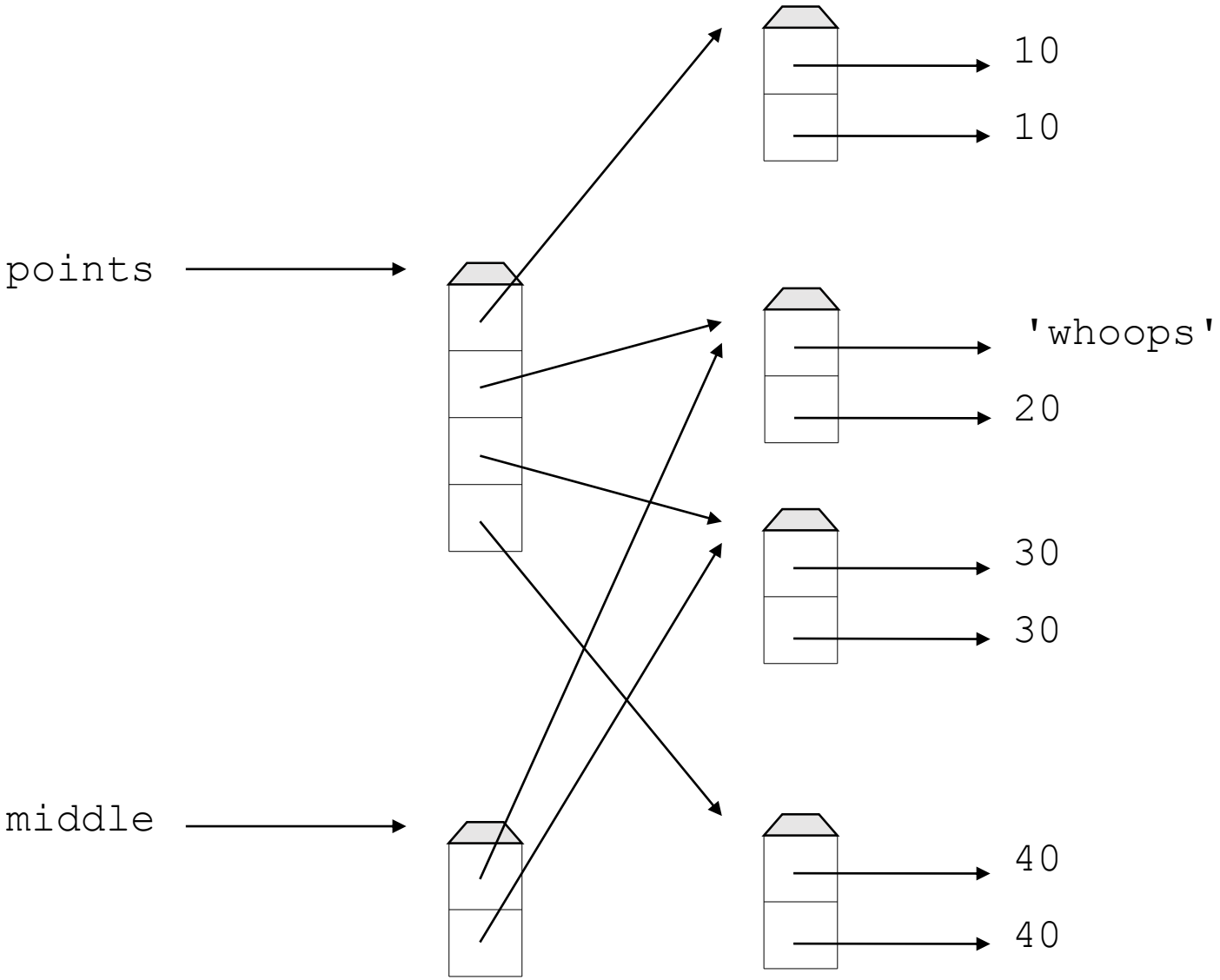
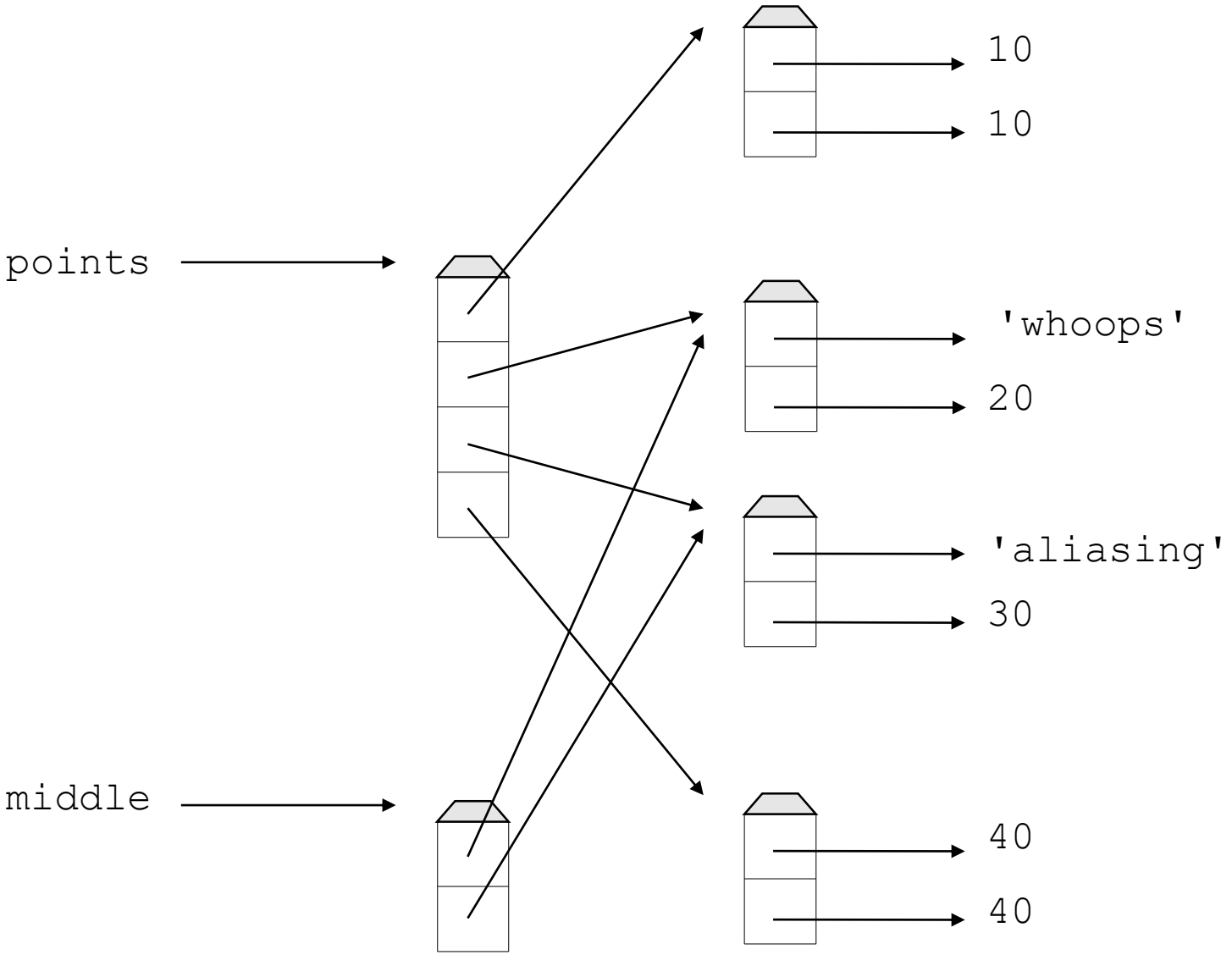

points
10
10
20
20
30
30
40
40


points
middle
10
10
20
20
30
30
40
40


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


points
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10
10
'whoops'
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30
40
40

created by

Greg Wilson

October 2010