In [21]:
```
from collections import defaultdict
```

Dictionaries

In [3]:
```
animals = {
    'a': 'aardvark',
    'b': 'bear',
    'c': 'cat',
}
animals
```

Out[3]:
```
{'a': 'aardvark', 'b': 'bear', 'c': 'cat'}
```

In [4]:
```
animals['a']
```

Out[4]:
```
'aardvark'
```

In [5]:
```
animals['d'] = 'dog'
```

In [6]:
```
animals
```

Out[6]:
```
{'a': 'aardvark', 'b': 'bear', 'c': 'cat', 'd': 'dog'}
```

In [7]:
```
animals['a'] = 'antelope'
animals
```

Out[7]:
```
{'a': 'antelope', 'b': 'bear', 'c': 'cat', 'd': 'dog'}
```

In [8]:
```
animals.keys()
```

Out[8]:
```
dict_keys(['a', 'b', 'c', 'd'])
```

In [9]:
```
animals.values()
```

Out[9]:
```
dict_values(['antelope', 'bear', 'cat', 'dog'])
```

In [10]:
```
list(animals.keys())
```

Out[10]:
```
['a', 'b', 'c', 'd']
```

In [11]:
```
animals['e']
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
Input In [11], in <module>
----> 1 animals['e']

KeyError: 'e'
```

In [15]:
```
animals.get('a')
```

Out[15]:
```
'antelope'
```

In [16]:
```
len(animals)
```

Out[16]:
```
4
```

In [17]:
```
animals = {
    'a': ['aardvark', 'antelope'],
    'b': ['bear'],
}
```

In [18]:
```
animals['b'].append('bison')
```

In [19]:
```
animals['c'] = ['cat']
```

In [20]:
```
if 'c' not in animals:
    animals['c'] = []

animals['c'].append('cat')
```

The Default Dict

In [22]:
```
animals = defaultdict(list)
```

In [23]:
```
animals
```

Out[23]:
```
defaultdict(list, {})
```

In [24]:
```
animals['e'].append('elephant')
animals
```

Out[24]:
```
defaultdict(list, {'e': ['elephant']})
```

In [25]:
```
animals['e'].append('emu')
animals
```

Out[25]:
```
defaultdict(list, {'e': ['elephant', 'emu']})
```

In [26]:
```
animals['f']
```

Out[26]:
```
[]
```

In [ ]:
```

```