

```
spam = {'name': 'Polka', 'color': 'red', 'age': 42}
```

```
for v in spam.values():  
    print(v)
```

```
Polka  
red  
42
```

```
for k in spam.keys():  
    print(k)
```

```
name  
color  
age
```

```
for i in spam.items():  
    print(i)
```

```
('name', 'Polka')  
('color', 'red')  
('age', 42)
```

```
spam = {'name': 'Polka', 'color': 'red', 'age': 42}
```

```
for i in spam.items():  
    print(i)
```

```
('name', 'Polka')  
( 'color', 'red')  
( 'age', 42)
```

```
for k, v in spam.items():  
    print(k + ' = ' + str(v))
```

```
name = Polka  
color = red  
age = 42
```

Set (remove repetition)

- `set_variable = {item1, item2, ..., itemN}`

```
programming_languages = {'python', 'ruby', 'python', 'c'}  
print(programming_languages)
```

```
{'ruby', 'python', 'c'}
```

Summary

- `list_variable = [item1, item2, ..., itemN]`
- `tuple_variable = (item1, item2, ..., itemN)` **fixed**
- `dictionary_variable = {pair_item1, pair_item2, ..., pair_itemN}`
- `set_variable = {item1, item2, ..., itemN}` **remove repetition**

Nesting

- List of dictionaries
- Store list in dictionary
- Store dictionary in dictionary

List of dictionaries

```
pet_0 = {'name': 'Polka', 'species': 'dog', 'age': 5}
pet_1 = {'name': 'Sophie', 'species': 'cat', 'age': 8}
pet_2 = {'name': 'Jerry', 'species': 'rabbit', 'age': 3}
pets = [pet_0, pet_1, pet_2]
print(f'Total number of pets: {len(pets)}')
for pet in pets:
    print(pet)
```

```
Total number of pets: 3
{'name': 'Polka', 'species': 'dog', 'age': 5}
{'name': 'Sophie', 'species': 'cat', 'age': 8}
{'name': 'Jerry', 'species': 'rabbit', 'age': 3}
```

Store list in dictionary

```
pet = {'name': 'Sophie', 'species': 'cat', 'age': 8, 'favorite_foods': ['fish', 'chicken', 'mouse']}  
print(f"{pet['name']} is a {pet['species']}. Her/His favorite_foods are: ")  
for food in pet['favorite_foods']:  
    print(food)
```

```
Sophie is a cat. Her/His favorite_foods are:  
fish  
chicken  
mouse
```

Store dictionary in dictionary

```
users = {  
    'aeinstein': {  
        'first': 'albert',  
        'last': 'einstein',  
        'location': 'princeton',  
    },  
    'mcurie': {  
        'first': 'marie',  
        'last': 'curie',  
        'location': 'paris',  
    },  
}
```

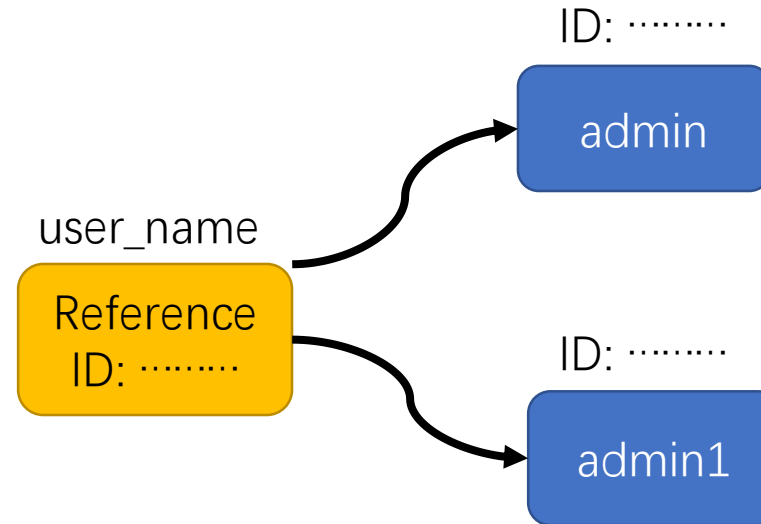


```
for username, user_info in users.items():  
    print(f"Username: {username}")  
    full_name = f"{user_info['first']} {user_info['last']}"  
    location = user_info['location']  
    print(f"\tFull name: {full_name.title()}")  
    print(f"\tLocation: {location.title()}")
```

```
Username: aeinstein  
    Full name: Albert Einstein  
    Location: Princeton  
Username: mcurie  
    Full name: Marie Curie  
    Location: Paris
```

In Python, each value possess only one identifier.

```
user_name = 'admin'  
print(id(user_name))  
user_name = 'admin1'  
print(id(user_name))
```



```
2609570977080  
2609570977136
```

Variable stores the reference of memory block in Python (For C\ C++, it is different)

An example for List

```
spam = [0, 1, 2, 3, 4, 5]
cheese = spam
cheese[1] = 'Hello!'
print(spam)
print(cheese)
```

```
[0, 'Hello!', 2, 3, 4, 5]
[0, 'Hello!', 2, 3, 4, 5]
```

