Python
MeetUp
Ekb

apiqa.io

Мутабельные и иммутабельные типы данных

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```python
a = 5
def change(a: int):
    a = 42

change(a)
print(a)
```

5

```
a = [5]
def change(a: list):
    a += [42]

change(a)
print(len(a))
```

2

```python
a = [5]
def change(a: list):
    a = a + [42]

change(a)
print(len(a))
```

1

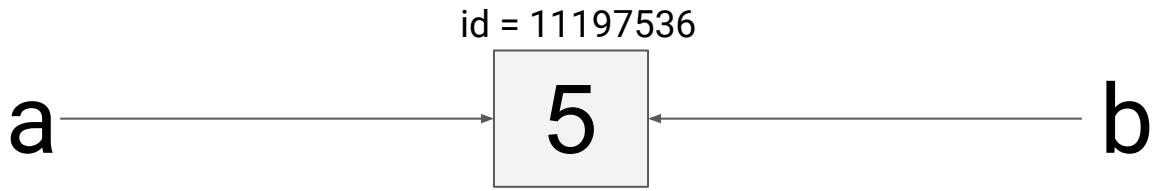
Python data types

Immutable	Mutable
int, float, complex	list, set
tuple, frozenset	dict
bytes	bytearray
str	
bool	

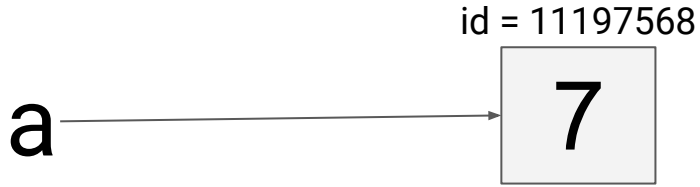
Immutable

a = 5

b = a



a += 2



WAT?

```
a = 100
b = 100
a is b // True
```

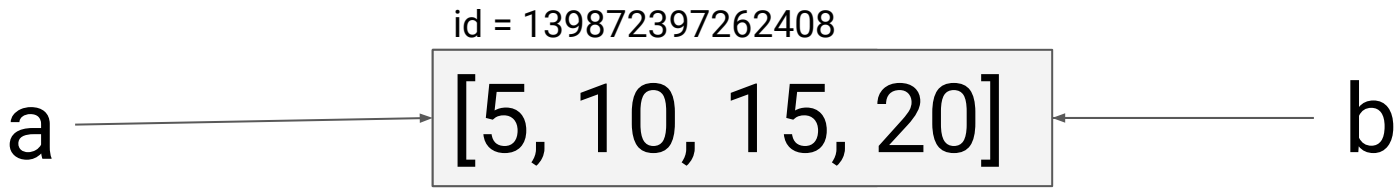
```
a = 500
b = 500
a is b // False
```

```
a = 'mystring'
b = 'mystring'
a is b // True
```

```
a = 'what?'
b = 'what?'
a is b // False
```

Mutable

```
a = [5, 10, 15]
b = a
```




```
a += [20]
```

Pitfalls

- default mutable arguments
- side-effects

Default mutable argument

```
def change(a: list = []):
    a += [10]
    print(a)

change() // [10]
change() // [10, 10]
change() // [10, 10, 10]
```

Default mutable argument: solution

```
def change(a: Optional[List] = None):
    if a is None:
        a = []
    a += [10]
    print(a)

change() // [10]
change() // [10]
change() // [10]
```

PEP 505 -- None-aware operators (??=)

```
a = None
b = ''
c = 0

a ??= 'value'
b ??= undefined_name
c ??= shutil.rmtree('/') # don't try this at home, kids

assert a == 'value'
assert b == ''
assert c == 0 and any(os.scandir('/'))
```

Side-effect

```
a = [{
    'year': 2019,
    'month': 12,
    'day': 6,
    'value': 1000
    },{
    'year': 1970,
    'month': 1,
    'day': 1,
    'value': 5
}]
```

```
def change(my_list: list):
    my_list = deepcopy(my_list)
    new_list = list(sorted(filter(
        lambda x: x['year'] == 2019, my_list)))
    for _, group in groupby(
            new_list, lambda x: x['month']):
        for record in group:
            record['value'] += record['value'] * 0.2

change(a)
print(a[0]['value']) // 1000.00
```

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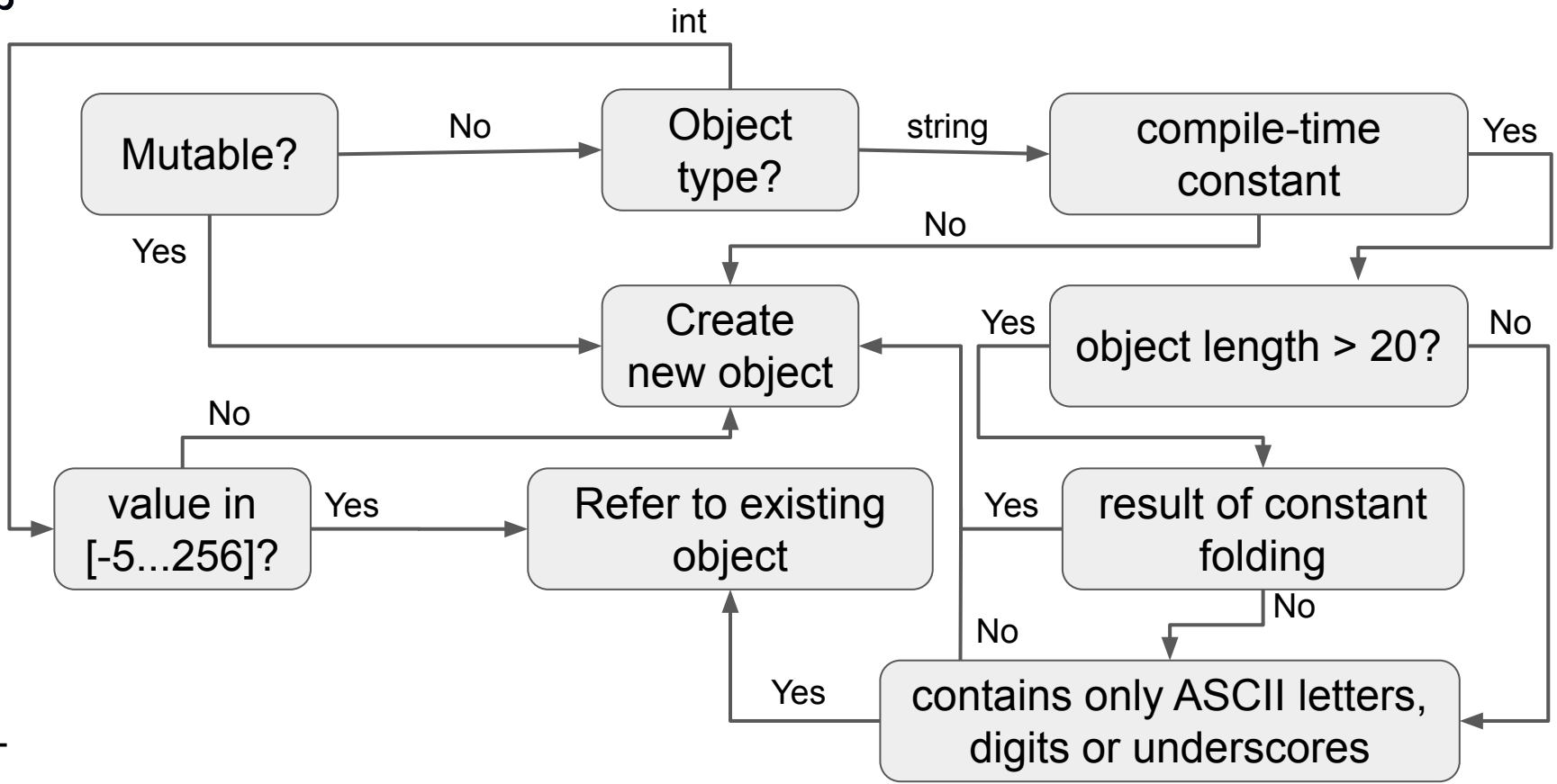
Objects optimization



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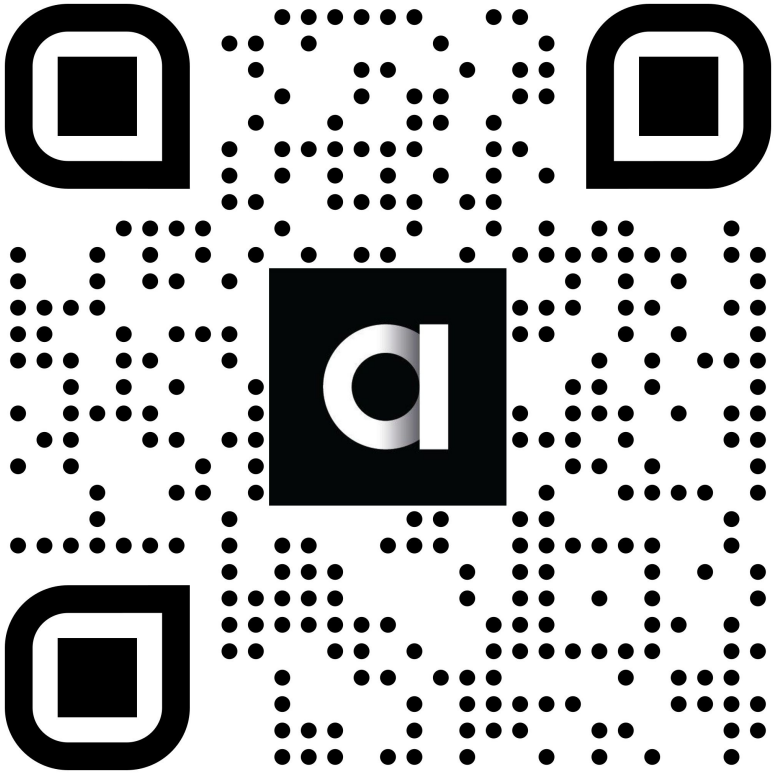
Contacts and links



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+=

```
a = [5]
a += [42]
```

```
a.__iadd__([42])
```

```
a = 5
a += 42
```

```
a.__add__(42)
```

```
a.__radd__(42)
```

bonus