第五周

1. id() -- 返回对象在虚拟内存中的地址 (正整数)，如果 id(a) == id(b)，那么 a is b (is 是个运算符)

```
(base) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ conda activate weeko5
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python
Python 3.12.9 | packaged by conda-forge | (main, Mar  4 2025, 22:48:41) [GCC 13.3.0] o
n linux
Type "help", "copyright", "credits" or "license" for more information.
>>> a = "hello"
"hello"
x = id(a>>> b = "hello"
>>> x = id(a)
>>> print(x)
140719431287360
>>> y = id(b)
>>> print(y)
140719431287360
>>>
```

2. type() -- 返回对象的类型

```
>>> a = [2, 5]
2, 5]
x = id(a)
>>> b = [2, 5]
>>> x = id(a)
b)
print(y)
a[0]>>> print(x)
140719433222592
>>> y = id(b)
>>> print(y)
140719433224384
>>> a[0] = 9
>>> print(a)
int(b)
print(id([9, 5]
>>> print(b)
[2, 5]
a))
print(id(b))>>> print(id(a))
140719433222592
>>> print(id(b))
140719433224384
>>>
```

3. isinstance() -- 判断对象是否属于某个 (或某些) 类型

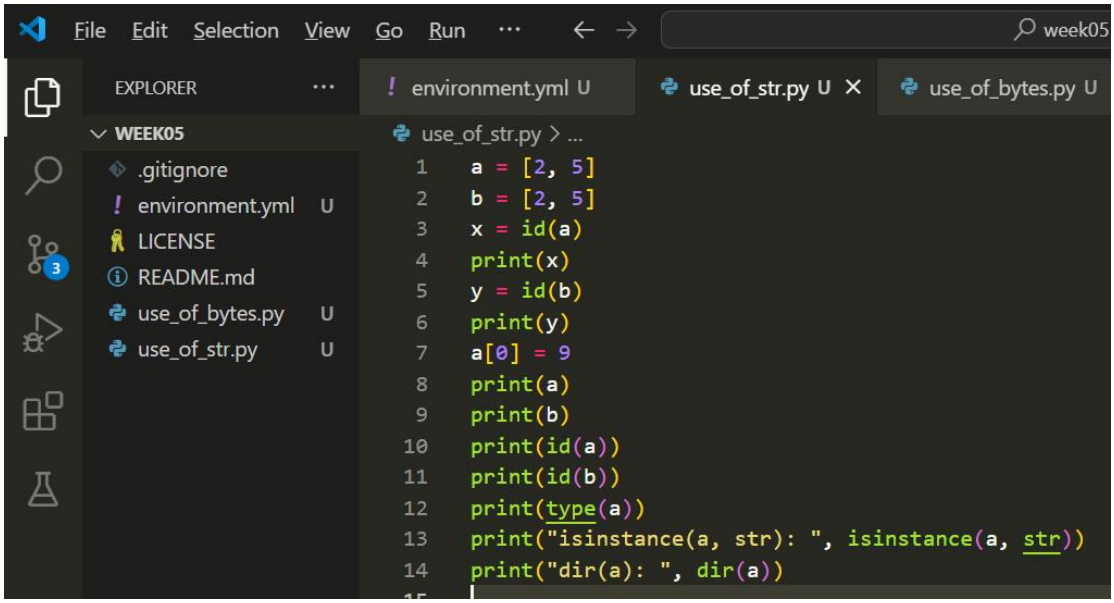
use_of_str.py > ...

```python
a = [2, 5]
b = [2, 5]
x = id(a)
print(x)
y = id(b)
print(y)
a[0] = 9
print(a)
print(b)
print(id(a))
print(id(b))

print(type(a))
print("isinstance(a, str): ", isins
print("isinstance(a, list): ", isin
print(isinstance(a, (str, float)))
```

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
140336249555392
140336249557248
[9, 5]
[2, 5]
140336249555392
140336249557248
<class 'list'>
isinstance(a, str):  False
isinstance(a, list):  True
False
```

4. dir() -- 返回对象所支持的属性 (attributes) 的名称列表




```
$ python use_of_str.py
1378651609344
1378651607360
[9, 5]
[2, 5]
1378651609344
1378651607360
<class 'list'>
isinstance(a, str):  False
dir(a):  ['__add__', '__class__', '__class_getitem__', '__contai
ns__', '__delattr__', '__delitem__', '__dir__', '__doc__', '__eq
__', '__format__', '__ge__', '__getattribute__', '__getitem__',
'__getstate__', '__gt__', '__hash__', '__iadd__', '__imul__', '_
_init__', '__init_subclass__', '__iter__', '__le__', '__len__',
'__lt__', '__mul__', '__ne__', '__new__', '__reduce__', '__reduc
e_ex__', '__repr__', '__reversed__', '__rmul__', '__setattr__',
'__setitem__', '__sizeof__', '__str__', '__subclasshook__', 'app
end', 'clear', 'copy', 'count', 'extend', 'index', 'insert', 'po
p', 'remove', 'reverse', 'sort']
```

5. str() -- 返回对象 print 时要显示在终端的字符串
6. 可以利用 assert 语句查验某个表达式 (expression) 为真，否则报错 (AssertionError) 退出

use_of_str.py > ...

```
4    print(x)
5    y = id(b)
6    print(y)
7    a[0] = 9
8    print(a)
9    print(b)
10   print(id(a))
11   print(id(b))
12
13   print(type(a))
14   print("isinstance(a, str): ", isins
15   print("isinstance(a, list): ", isin
16   print(isinstance(a, (str, float)))
17   assert isinstance(a, list)
18   print("goodbye")
```

```
    assert isinstance(a, str)
           ^^^^^^^^^^^^^^^^^^
AssertionError
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
139751660227008
139751660228864
[9, 5]
[2, 5]
139751660227008
139751660228864
<class 'list'>
isinstance(a, str):  False
isinstance(a, list):  True
False
goodbye
```

7. 可以利用 try 语句拦截报错，避免退出，将流程 (flow) 转入 except 语句

```
print(type(a))
print("isinstance(a, str): ", isins
print("isinstance(a, list): ", isin
print(isinstance(a, (str, float)))
try:
    assert isinstance(a, str)
except AssertionError:
    print("type error")
print("goodbye")
```

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$  python use_of_str.py
139770610010560
139770610012416
[9, 5]
[2, 5]
139770610010560
139770610012416
<class 'list'>
isinstance(a, str):  False
isinstance(a, list):  True
False
type error
goodbye
```

8. 可以调用 breakpoint() 函数暂停程序运行，进入 pdb 调试 (debug) 模式

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
139844895099328
139844895101184
[9, 5]
[2, 5]
139844895099328
139844895101184
<class 'list'>
isinstance(a, str):  False
isinstance(a, list):  True
False
> /mnt/d/aaa/A/week05/use_of_str.py(21)<module>()
-> print("type error")
(Pdb) l
 16     print(isinstance(a, (str, float)))
 17     try:
 18         assert isinstance(a, str)
 19     except AssertionError:
 20         breakpoint()
 21  ->     print("type error")
 22     print("goodbye")
[EOF]
(Pdb) p a
[9, 5]
(Pdb) p isinstance(a,str)
False
(Pdb) import wat
(Pdb) wat / a
```

```
(Pdb) import wat
(Pdb) wat / a
value: [
    9,
    5,
]
type: list
len: 2

Public attributes:
  def append(object, /) # Append object to the end of the list.
  def clear() # Remove all items from list.
  def copy() # Return a shallow copy of the list.
  def count(value, /) # Return number of occurrences of value.
  def extend(iterable, /) # Extend list by appending elements from the iterable.
  def index(value, start=0, stop=9223372036854775807, /) # Return first index of value
.…
  def insert(index, object, /) # Insert object before index.
  def pop(index=-1, /) # Remove and return item at index (default last).…
  def remove(value, /) # Remove first occurrence of value.…
  def reverse() # Reverse *IN PLACE*.
  def sort(*, key=None, reverse=False) # Sort the list in ascending order and return N
one.…
```

9. 字面值 (literal) (包括 f-string 语法)

use_of_str.py > ...

```python
print("字面值")
s = "university"
print(s)
print(isinstance(s, str))
assert type(s) is str
```

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
字面值
university
True
```

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
字面值
university
True
f-string
name: Tom
```

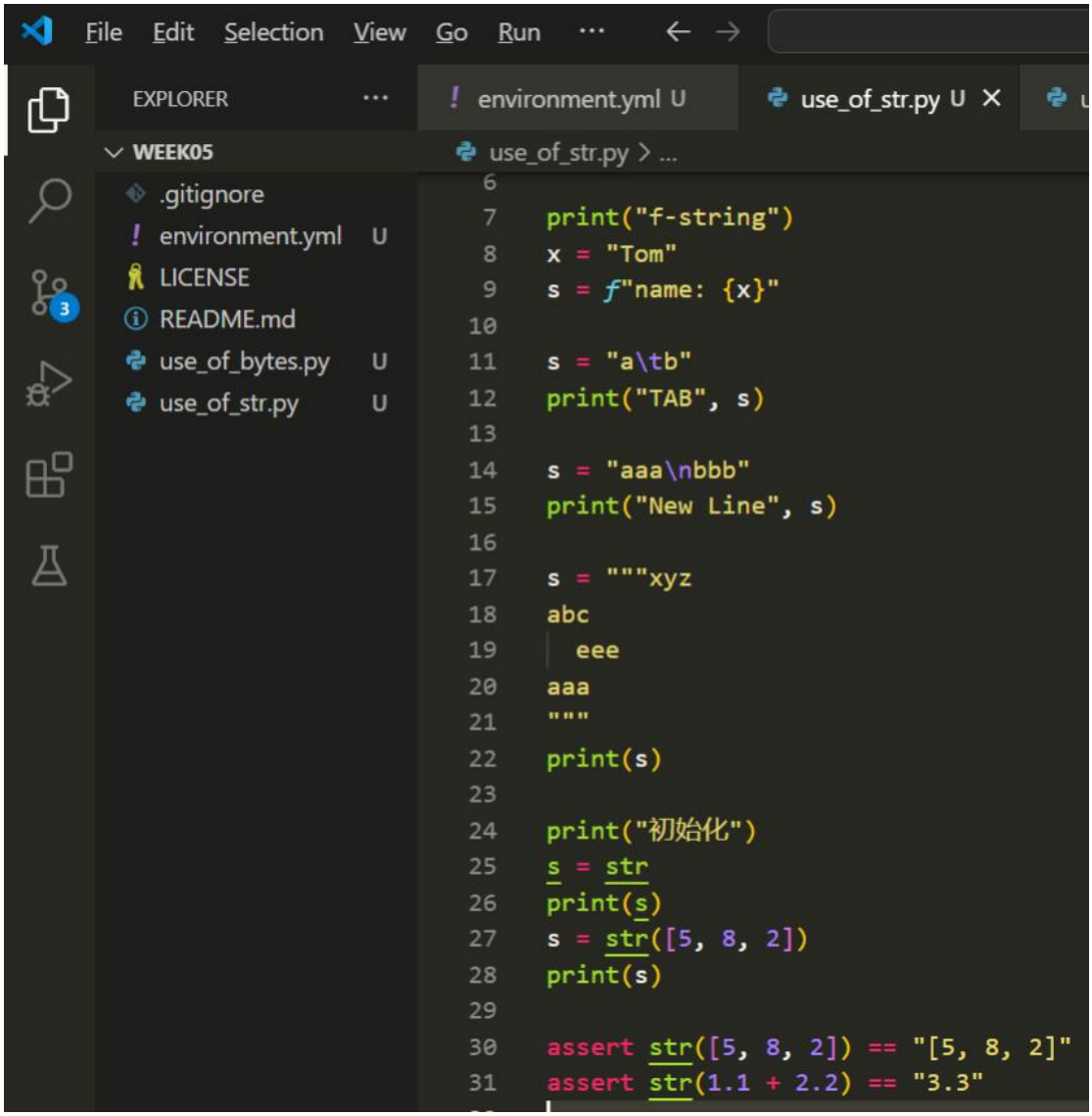
```python
print("字面值")
s = "university"
print(s)
print(isinstance(s, str))
assert type(s) is str

print("f-string")
x = "Tom"
s = f"name: {x}"
print(s)
```

10. 推导式 (comprehension) (仅限 list、dict、set)

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
字面值
university
True
f-string
name: Tom
TAB a	b
New Line aaa
bbb
xyz
abc
  eee
aaa
```

11. 初始化 (init)



12. 运算值 (operator)

```
> /mnt/d/aaa/A/week05/use_of_str.py(33)<module>()
-> assert str(1.1 + 2.2) == "3.3"
(Pdb) p id(s)
139680593919216
(Pdb)
139680593919216
(Pdb) l
 28     s = str([5, 8, 2])
 29     print(s)
 30
 31     assert str([5, 8, 2]) == "[5, 8, 2]"
 32     breakpoint()
 33  -> assert str(1.1 + 2.2) == "3.3"
 34
 35     s = "="
 36     x = id(s)
 37     s = s * 20
 38     y = id(s)
(Pdb) l
 39     print(s)
 40     assert x != y
[EOF]
(Pdb)
```

13. 索引值 (subscription)

```python
s = "hello"
assert s[3] == "1"
assert s[-1] == "o"
assert s[:3] == "hel"
assert s[4] == s[-1]
try:
    s[5]
except IndexError as e:
    print(e)
```

```
> /mnt/d/aaa/A/week05/use_of_str.py(33)<module>()
-> assert str(1.1 + 2.2) == "3.3"
(Pdb) l
 28     s = str([5, 8, 2])
 29     print(s)
 30
 31     assert str([5, 8, 2]) == "[5, 8, 2]"
 32     breakpoint()
 33  -> assert str(1.1 + 2.2) == "3.3"
 34
 35     s = "="
 36     x = id(s)
 37     s = s * 20
 38     y = id(s)
(Pdb) l
 39     print(s)
 40     assert x != y
 41
 42     s = "hello"
 43     assert s[3] == "1"
 44     assert s[-1] == "o"
 45     assert s[:3] == "hel"
 46     assert s[4] == s[-1]
 47     try:
 48         s[5]
 49     except IndexError as e:
(Pdb) l
 50         print(e)
[EOF]
```

14. 返回值 (return value of function/method call)

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
name: {}, age {}
name: Jack, age 21
```

15. 对数学运算符 (+、-、*、**、/、//、%、@) 有没有支持

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
  File "/mnt/d/aaa/A/week05/use_of_str.py", line 19
    s = s / 2
SyntaxError: expected 'except' or 'finally' block
```

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
  File "/mnt/d/aaa/A/week05/use_of_str.py", line 19
    s = s * 2
SyntaxError: expected 'except' or 'finally' block
```

16. 如何判断相等 (==)

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
name: {}, age {}
name: Jack, age 21
ghiabc
ghiabc
Traceback (most recent call last):
  File "/mnt/d/aaa/A/week05/use_of_str.py", line 23, in <module>
    assert s == "aaaa"
           ^^^^^^^^^^^
```

17. 什么值被当作 True，什么值被当作 False

```python
s = "book"
print(iter(s))


for c in s:
    print(c)

print("abc" > "ABC")
print("123" > "abc")
print("9" > ".")
print("9" > ":")
print("book" > "box")
print("book" > "{")
```

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
<str_ascii_iterator object at 0x7fc386cda9e0>
b
o
o
k
True
False
True
False
False
False
```

18. 是否可迭代 (iterable)，如何做迭代 (for 循环)

```python
s = "book"
print(iter(s))


for c in s:
    print(c)
```

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
<str_ascii_iterator object at 0x7f7ff8515780>
b
o
o
k
```

19. 是否支持返回长度 (len)

```
print("abc" > "ABC")
print("123" > "abc")
print("9" > ".")
print("9" > ":")
print("book" > "box")
print("book" > "{")

s = "book"
print(iter(s))


for c in s:
    print(c)

print(len(s))
```

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
True
False
True
False
False
False
<str_ascii_iterator object at 0x7f1eab75a980>
b
o
o
k
4
```

20. 是否 (如何) 支持索引操作 (subscription) ([] 运算符)

use_of_str.py > ...

```python
s = "book"
assert s[1:3] == "oo"
```

21. 拥有哪些常用方法 (method) 可供调用 (() 运算符)

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
--Return--
> /mnt/d/aaa/A/week05/use_of_str.py(3)<module>()->None
-> breakpoint()
(Pdb)
(Pdb)
(Pdb) p s
'book'
(Pdb) import wat
(Pdb) wat / s
```

```
value: 'book'
type: str
len: 4

Public attributes:
  def capitalize() # Return a capitalized version of the string.…
  def casefold() # Return a version of the string suitable for caseless comparisons.
  def center(width, fillchar=' ', /) # Return a centered string of length width.…
  def count(…) # S.count(sub[, start[, end]]) -> int…
  def encode(encoding='utf-8', errors='strict') # Encode the string using the codec re
gistered for encoding.…
  def endswith(…) # S.endswith(suffix[, start[, end]]) -> bool…
  def expandtabs(tabsize=8) # Return a copy where all tab characters are expanded usin
g spaces.…
  def find(…) # S.find(sub[, start[, end]]) -> int…
  def format(…) # S.format(*args, **kwargs) -> str…
  def format_map(…) # S.format_map(mapping) -> str…
  def index(…) # S.index(sub[, start[, end]]) -> int…
```

```
(Pdb) p s
'book'
(Pdb) p s.translate({'o': 'x' })
'book'
(Pdb) p ord('x')
120
(Pdb) p s.translate({ord('o'): ord('x') })
'bxxk'
(Pdb) wat / s.translate
```

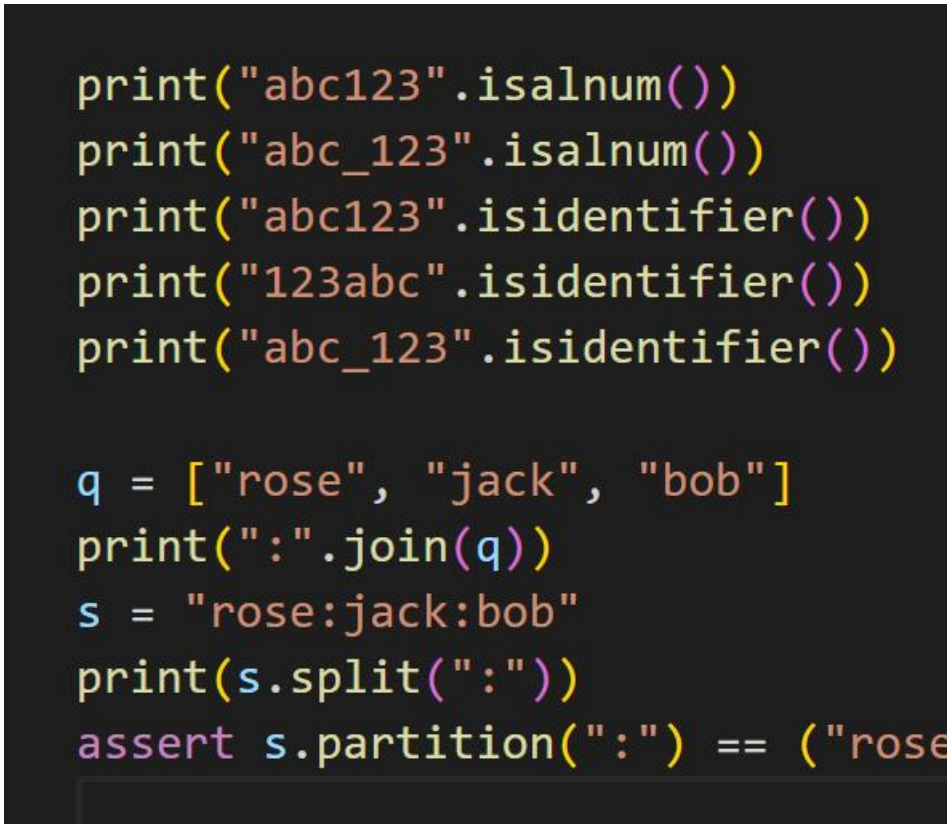
```python
s = "book"
assert s[1:3] == "oo"
s = "the book of why"
print(s.capitalize())
print(s)
print(s.count("oo") == 3)

print("abc123".isalnum())
print("abc_123".isalnum())
print("abc123".isidentifier())
print("123abc".isidentifier())
print("abc_123".isidentifier())
```

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
The book of why
the book of why
False
True
False
True
False
True
```

```python
s = "book"
assert s[1:3] == "oo"
s = "the book of why"
print(s.capitalize())
print(s)
breakpoint()
```

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
The book of why
the book of why
False
True
False
True
False
True
rose:jack:bob
['rose', 'jack', 'bob']
```



```
print("abc123".isalnum())
print("abc_123".isalnum())
print("abc123".isidentifier())
print("123abc".isidentifier())
print("abc_123".isidentifier())

q = ["rose", "jack", "bob"]
print(":".join(q))
s = "rose:jack:bob"
print(s.split(":"))
assert s.partition(":") == ("rose
```

```
(weeko5) sherry@LAPTOP-05T5IN81:/mnt/d/aaa/A/week05$ python use_of_str.py
The book of why
the book of why
--Return--
> /mnt/d/aaa/A/week05/use_of_str.py(6)<module>()->None
-> breakpoint()
(Pdb) import wat
(Pdb) wat / s
value: 'the book of why'
type: str
len: 15

Public attributes:
  def capitalize() # Return a capitalized version of the string.…
  def casefold() # Return a version of the string suitable for caseless comparis
```