

Python 数据类型

1. Fork 第 04 周打卡 仓库至你的名下，然后将你名下的这个仓库 Clone 到你的本地计算机

名称	修改日期
myproject	2025/3/19 16:58
mywork	2025/3/13 16:45
prj1	2025/3/19 15:52
week02	2025/3/13 17:18
week03	2025/3/19 19:03
week04	2025/3/28 19:57

```
Administrator@DESKTOP-75CI4VE MINGW64 ~
$ cd repo
(base)
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo
$ ls -l
total 12
drwxr-xr-x 1 Administrator 197121 0 Mar 19 16:58 myproject/
drwxr-xr-x 1 Administrator 197121 0 Mar 13 16:45 mywork/
drwxr-xr-x 1 Administrator 197121 0 Mar 19 15:52 prj1/
drwxr-xr-x 1 Administrator 197121 0 Mar 13 17:18 week02/
drwxr-xr-x 1 Administrator 197121 0 Mar 19 19:03 week03/
(base)
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo
$ git clone https://gitcode.com/yyyyo/week04.git
Cloning into 'week04'...
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (5/5), done.
remote: Total 5 (delta 0), reused 5 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (5/5), 8.43 KiB | 392.00 KiB/s, done.
(base)
```

```
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ git remote show origin
* remote origin
Fetch URL: https://gitcode.com/yyyyo/week04.git
Push URL: https://gitcode.com/yyyyo/week04.git
HEAD branch: main
Remote branch:
  main tracked
Local branch configured for 'git pull':
  main merges with remote main
Local ref configured for 'git push':
  main pushes to main (up to date)
(base)
```

2. 用 VS Code 打开项目目录，新建一个 environment.yml 文件，指定安装 Python 3.12，然后运行 conda env create 命令创建 Conda 环境

```
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ ls -l ../myproject/
total 2
-rw-r--r-- 1 Administrator 197121 87 Mar 19 16:46 environment.yml
-rw-r--r-- 1 Administrator 197121 159 Mar 19 16:50 main.py
(base)
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ cat ../myproject/environment.yml
name: myproject
channels:
  - conda-forge
dependencies:
  - python=3.12
  - pandas(base)
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ cp ../myproject/environment.yml
```

```
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ ls -l
total 25
-rw-r--r-- 1 Administrator 197121 18805 Mar 28 19:57 LICENSE
-rw-r--r-- 1 Administrator 197121 2239 Mar 28 19:57 README.md
-rw-r--r-- 1 Administrator 197121 74 Mar 28 20:05 environment.yml
(base)
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ cat environment.yml
name: week04
channels:
  - conda-forge
dependencies:
  - python=3.12
```

```

Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ ls -l
total 25
-rw-r--r-- 1 Administrator 197121 18805 Mar 28 19:57 LICENSE
-rw-r--r-- 1 Administrator 197121 2239 Mar 28 19:57 README.md
-rw-r--r-- 1 Administrator 197121 74 Mar 28 20:05 environment.yml
(base)
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ cat environment.yml
name: week04
channels:
  - conda-forge
dependencies:
  - python=3.12
(base)
done
#
# To activate this environment, use
#
#     $ conda activate week04
#
# To deactivate an active environment, use
#
#     $ conda deactivate
(base)

```

3.新建一个 contacts.txt 文件，每行写一个联系人，每个联系人都包含姓名、性别、邮箱三个字段，用空格分隔

```

Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ cat contacts.txt
白展堂 男 baizhantang@163.com
佟湘玉 女 tongxiangyu@163.com
吕轻侯 男 lvqinghou@126.com
郭芙蓉 女 guofurong@126.com
李秀莲 男 lixiulian@163.com
祝无双 女 zhuwushuang@163.com
(base)

```

4. 新建一个 main.py 文件，里面写 Python 代码，要求读取 contacts.txt 文件的内容，进行数据处理后，输出一个 emails.txt 文件
5. 可以将以上“任务要求”的文本，复制粘贴到大模型（比如豆包、DeepSeek）里，请 AI 来帮助编写程序初稿
6. AI 回复的只是静态代码，而且可能含有错误，所以我们必须在 Conda 环境里运行代码，逐行调试，检查每一行代码的运行都符合我们的期望（越是初学者越应该慢慢调试、检查、试验，借此学习）

```

main.py > ...
1  def read_contacts(file_path):
2      contacts = []
3      try:
4          with open(file_path, 'r', encoding='utf-8') as file:
5              for line in file:
6                  name, gender, email = line.strip().split()
7                  contacts.append((name, gender, email))
8      except FileNotFoundError:
9          print(f"错误: 文件 {file_path} 未找到。")
10     except Exception as e:
11         print(f"错误: 读取文件时发生未知错误: {e}")
12     return contacts
13
14
15     def sort_contacts(contacts):
16         def custom_sort_key(contact):
17             email = contact[2]
18             username, domain = email.split('@')
19             return (domain, username)
20         return sorted(contacts, key=custom_sort_key)
21
22
23     def generate_emails(contacts, output_file):
24         try:
25             with open(output_file, 'w', encoding='utf-8') as file:
26                 for name, gender, email in contacts:
27                     title = '先生' if gender == '男' else '女士'
28                     email_content = f"to: <{email}>\n" \
29                                     f"尊敬的{name}{title}, 您的会员资格即将到期, 请及时续费.\n" \
30                                     " "

```

```

WEEK04
├── .gitignore
├── contacts.txt
├── emails.txt
├── environment.yml
├── LICENSE
├── main.py
└── README.md

$ cat main.py
def read_contacts(file_path):
    contacts = []
    try:
        with open(file_path, 'r', encoding='utf-8') as file:
            for line in file:
                name, gender, email = line.strip().split()
                contacts.append((name, gender, email))
    except FileNotFoundError:
        print(f"错误: 文件 {file_path} 未找到。")
    except Exception as e:
        print(f"错误: 读取文件时发生未知错误: {e}")
    return contacts

def sort_contacts(contacts):
    def custom_sort_key(contact):
        email = contact[2]
        username, domain = email.split('@')
        return (domain, username)
    return sorted(contacts, key=custom_sort_key)

```

```

$ python main.py
邮件已成功生成到 emails.txt。

```



```
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ cat emails.txt
to: <guofurong@126.com>
尊敬的郭芙蓉女士，您的会员资格即将到期，请及时续费。
---
to: <lvqinghou@126.com>
尊敬的吕轻侯先生，您的会员资格即将到期，请及时续费。
---
to: <baizhantang@163.com>
尊敬的白展堂先生，您的会员资格即将到期，请及时续费。
---
to: <lixilulian@163.com>
尊敬的李秀莲先生，您的会员资格即将到期，请及时续费。
---
to: <tongxiangyu@163.com>
尊敬的佟湘玉女士，您的会员资格即将到期，请及时续费。
---
to: <zhuwushuang@163.com>
尊敬的祝无双女士，您的会员资格即将到期，请及时续费。
---
```

调试

```
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ rm emails.txt
(base)
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ ls -l
total 30
-rw-r--r-- 1 Administrator 197121 18805 Mar 28 19:57 LICENSE
-rw-r--r-- 1 Administrator 197121 2239 Mar 28 19:57 README.md
-rw-r--r-- 1 Administrator 197121 202 Mar 28 20:09 contacts.txt
-rw-r--r-- 1 Administrator 197121 74 Mar 28 20:05 environment.yml
-rw-r--r-- 1 Administrator 197121 1532 Mar 28 20:23 main.py
(base)
```

```
Administrator@DESKTOP-75CI4VE MINGW64 ~/repo/week04 (main)
$ python -m pdb main.py
> c:\users\administrator\repo\week04\main.py(1)<module>()
-> def read_contacts(file_path):
(Pdb) 1
1 -> def read_contacts(file_path):
2     contacts = []
3     try:
4         with open(file_path, 'r', encoding='utf-8') as file:
5             for line in file:
6                 name, gender, email = line.strip().split()
7                 contacts.append((name, gender, email))
8     except FileNotFoundError:
9         print(f"错误：文件 {file_path} 未找到。")
10    except Exception as e:
11        print(f"错误：读取文件时发生未知错误：{e}")
(Pdb) n
> c:\users\administrator\repo\week04\main.py(15)<module>()
-> def sort_contacts(contacts):
(Pdb) 1
10    except Exception as e:
11        print(f"错误：读取文件时发生未知错误：{e}")
12    return contacts
13
14
15 -> def sort_contacts(contacts):
16     def custom_sort_key(contact):
17         email = contact[2]
18         username, domain = email.split('@')
19         return (domain, username)
20     return sorted(contacts, key=custom_sort_key)
```

```

(Pdb) 11
1   def read_contacts(file_path):
2       contacts = []
3       try:
4           with open(file_path, 'r', encoding='utf-8') as file:
5               for line in file:
6                   name, gender, email = line.strip().split()
7                   contacts.append((name, gender, email))
8       except FileNotFoundError:
9           print(f"错误: 文件 {file_path} 未找到。")
10      except Exception as e:
11          print(f"错误: 读取文件时发生未知错误: {e}")
12      return contacts
13
14
15  -> def sort_contacts(contacts):
16      def custom_sort_key(contact):
17          email = contact[2]
18          username, domain = email.split('@')
19          return (domain, username)
20      return sorted(contacts, key=custom_sort_key)
21
22
23      def generate_emails(contacts, output_file):
24          try:
25              with open(output_file, 'w', encoding='utf-8') as file:
26                  for name, gender, email in contacts:
27                      title = '先生' if gender == '男' else '女士'
28                      email_content = f"to: <{email}>\n" \
29                                     f"尊敬的{name}{title}, 您的会员资格即将
到期, 请及时续费。"
30                      file.write(email_content)
31                      print(f"邮件已成功生成到 {output_file}。")
32          except Exception as e:
33              print(f"错误: 写入文件时发生未知错误: {e}")
34
35
36
37      if __name__ == "__main__":
38          contacts = read_contacts('contacts.txt')
39          sorted_contacts = sort_contacts(contacts)
22
23      def generate_emails(contacts, output_file):
24          try:
25              with open(output_file, 'w', encoding='utf-8') as file:
26                  for name, gender, email in contacts:
27                      title = '先生' if gender == '男' else '女士'

```

```

41
(Pdb) p read_contacts
<function read_contacts at 0x000002341E55FA60>
(Pdb) s
> c:\users\administrator\repo\week04\main.py(23)<module>()
-> def generate_emails(contacts, output_file):
(Pdb) n
> c:\users\administrator\repo\week04\main.py(37)<module>()
-> if __name__ == "__main__":
(Pdb) p sort_contacts
<function sort_contacts at 0x000002341E55F920>
(Pdb) p contacts
*** NameError: name 'contacts' is not defined
(Pdb) s
> c:\users\administrator\repo\week04\main.py(38)<module>()
-> contacts = read_contacts('contacts.txt')
(Pdb) |

```

```
(Pdb) h 1
Usage: l(ist) [first[, last] | .]

List source code for the current file. Without arguments,
list 11 lines around the current line or continue the previous
listing. With . as argument, list 11 lines around the current
line. With one argument, list 11 lines starting at that line.
With two arguments, list the given range; if the second
argument is less than the first, it is a count.

The current line in the current frame is indicated by "->".
If an exception is being debugged, the line where the
exception was originally raised or propagated is indicated by
">>", if it differs from the current line.
```

```
(Pdb) l .
33         except Exception as e:
34             print(f"错误: 写入文件时发生未知错误: {e}")
35
36
37     if __name__ == "__main__":
38 ->         contacts = read_contacts('contacts.txt')
39             sorted_contacts = sort_contacts(contacts)
40             generate_emails(sorted_contacts, 'emails.txt')
41
```

[EOF]

```
(Pdb) l 1,5
1     def read_contacts(file_path):
2         contacts = []
3         try:
4             with open(file_path, 'r', encoding='utf-8') as file:
5                 for line in file:
```

```
(Pdb) p __name__
'__main__'
```

```
(Pdb)
generate_emails(sorted_contacts, 'emails.txt')
(Pdb) p contacts
[('白展堂', '男', 'baizhantang@163.com'), ('佟湘玉', '女', 'tongxiangyu@163.com'), ('吕轻侯', '男', 'lvqinghou@126.com'), ('郭芙蓉', '女', 'guofurong@126.com'), ('李秀莲', '女', 'lixuliian@163.com'), ('祝无双', '女', 'zhuwushuang@163.com')]
(Pdb) pp contacts
[('白展堂', '男', 'baizhantang@163.com'),
 ('佟湘玉', '女', 'tongxiangyu@163.com'),
 ('吕轻侯', '男', 'lvqinghou@126.com'),
 ('郭芙蓉', '女', 'guofurong@126.com'),
 ('李秀莲', '女', 'lixuliian@163.com'),
 ('祝无双', '女', 'zhuwushuang@163.com')]
(Pdb)
```