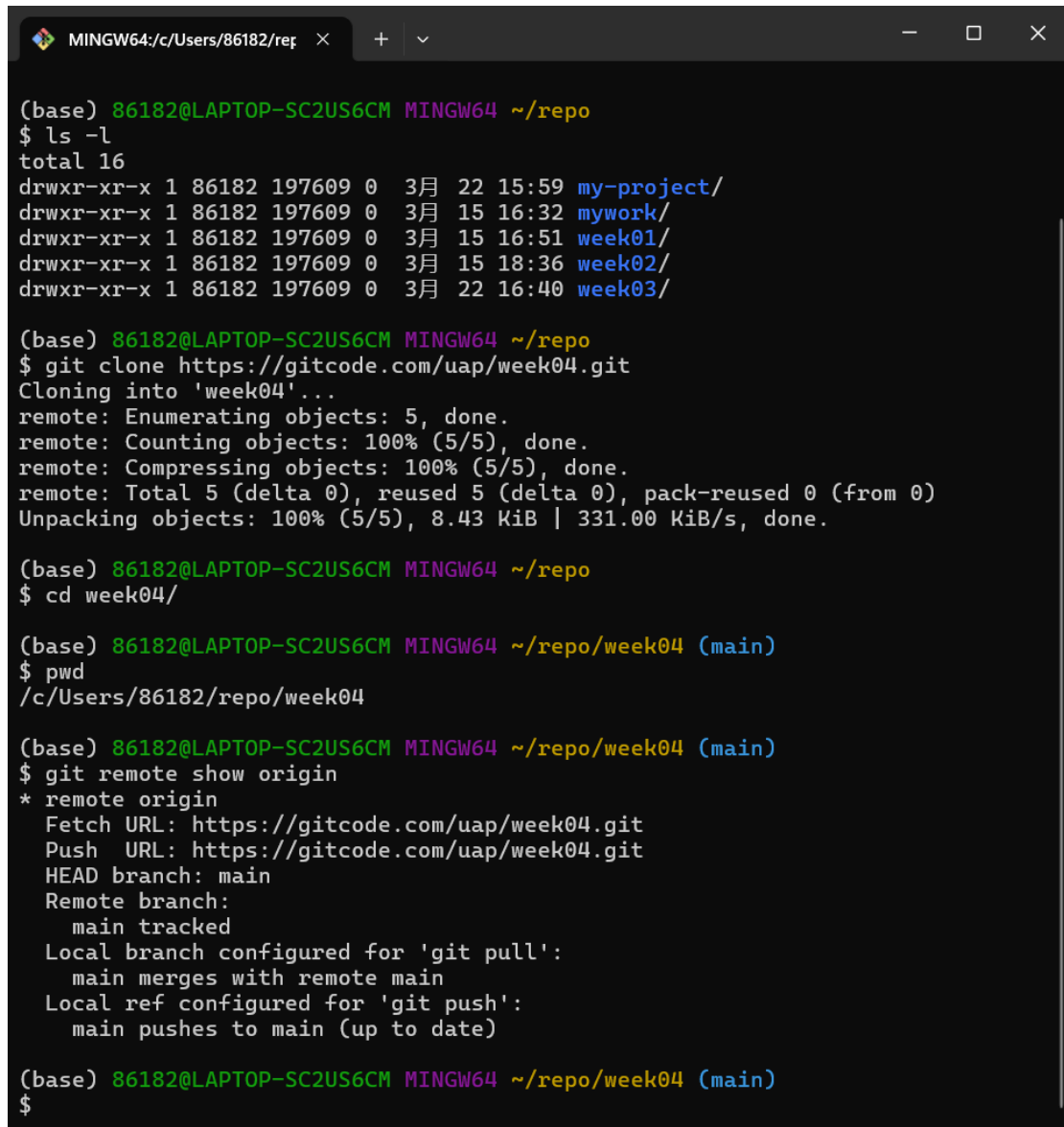


1. Fork [第 04 周打卡](#) 仓库至你的名下，然后将你名下的这个仓库 Clone 到你的本地计算机

A terminal window with a dark background and light-colored text. The window title bar shows 'MINGW64:/c/Users/86182/rep' and standard window controls. The terminal output shows a user at a prompt cloning a repository from GitCode. After cloning, the user navigates into the 'week04' directory and checks the remote origin configuration. The output of 'git remote show origin' shows the fetch and push URLs as 'https://gitcode.com/uap/week04.git' and the local branch 'main' configured to track the remote 'main' branch.

```
(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo
$ ls -l
total 16
drwxr-xr-x 1 86182 197609 0  3月 22 15:59 my-project/
drwxr-xr-x 1 86182 197609 0  3月 15 16:32 mywork/
drwxr-xr-x 1 86182 197609 0  3月 15 16:51 week01/
drwxr-xr-x 1 86182 197609 0  3月 15 18:36 week02/
drwxr-xr-x 1 86182 197609 0  3月 22 16:40 week03/

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo
$ git clone https://gitcode.com/uap/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 | 331.00 KiB/s, done.

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo
$ cd week04/

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ pwd
/c/Users/86182/repo/week04

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ git remote show origin
* remote origin
  Fetch URL: https://gitcode.com/uap/week04.git
  Push URL: https://gitcode.com/uap/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) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$
```

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

```
MINGW64:/c/Users/86182/reg x + v
}
Node.js v20.18.2
(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ ls -l ../my project
ls: cannot access '../my': No such file or directory
ls: cannot access 'project': No such file or directory

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ ls -l ../my-project
total 196846
-rw-r--r-- 1 86182 197609      88  3月 22 15:50 environment.yml
-rw-r--r-- 1 86182 197609 201568176  3月 22 16:07 EPA_SmartLocationDatabase_
V3_Jan_2021_Final.csv
-rw-r--r-- 1 86182 197609      696  3月 22 16:12 main.py

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ cat ../my
my-project/ mywork/

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ cat ../my-project/environment.yml
name: my-project
channels:
  - conda-forge
dependencies:
  - python=3.12
  - pandas

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ cp ../my-project/environment.yml ./

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ ls -l
total 25
-rw-r--r-- 1 86182 197609      88  3月 29 20:33 environment.yml
-rw-r--r-- 1 86182 197609 18805  3月 29 20:28 LICENSE
-rw-r--r-- 1 86182 197609  2239  3月 29 20:28 README.md

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$
```

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，例如

```
MINGW64:/c/Users/86182/reg × + v
done
#
# To activate this environment, use
#
#   $ conda activate week04
#
# To deactivate an active environment, use
#
#   $ conda deactivate

Retrieving notices: ...working... done

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ ls -l
total 25
-rw-r--r-- 1 86182 197609 0 3月 29 20:44 contacts.txt
-rw-r--r-- 1 86182 197609 74 3月 29 20:37 environment.yml
-rw-r--r-- 1 86182 197609 18805 3月 29 20:28 LICENSE
-rw-r--r-- 1 86182 197609 0 3月 29 20:42 main.py
-rw-r--r-- 1 86182 197609 2239 3月 29 20:28 README.md

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ cat contacts.txt

(base) 86182@LAPTOP-SC2US6CM 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) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ █
```

```
MINGW64:/c/Users/86182/reg x + v
# To deactivate an active environment, use
#
# $ conda deactivate

Retrieving notices: ...working... done

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ ls -l
total 25
-rw-r--r-- 1 86182 197609 0 3月 29 20:44 contacts.txt
-rw-r--r-- 1 86182 197609 74 3月 29 20:37 environment.yml
-rw-r--r-- 1 86182 197609 18805 3月 29 20:28 LICENSE
-rw-r--r-- 1 86182 197609 0 3月 29 20:42 main.py
-rw-r--r-- 1 86182 197609 2239 3月 29 20:28 README.md

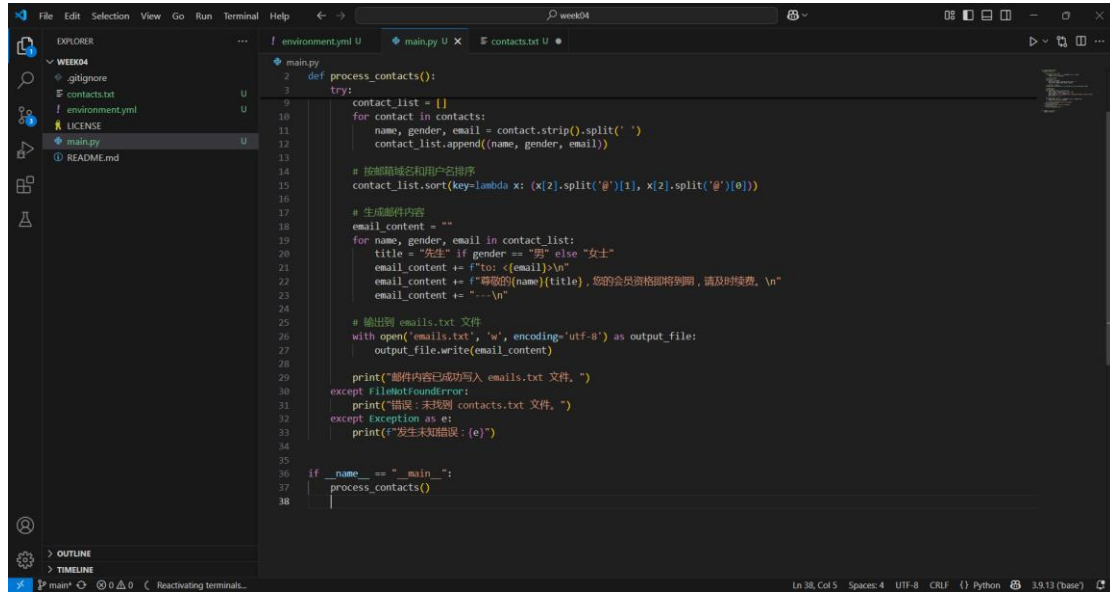
(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ cat contacts.txt

(base) 86182@LAPTOP-SC2US6CM 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) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ cat contacts.txt environment.yml
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.comname: week04
channels:
- conda-forge
dependencies:
- python=3.12

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$
```

拼接

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，例如
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



```
1 def process_contacts():
2     try:
3         contact_list = []
4         for contact in contacts:
5             name, gender, email = contact.strip().split(' ')
6             contact_list.append((name, gender, email))
7
8         # 按照邮箱域名和用户名排序
9         contact_list.sort(key=lambda x: (x[2].split('@')[1], x[2].split('@')[0]))
10
11         # 生成邮件内容
12         email_content = ""
13         for name, gender, email in contact_list:
14             title = "先生" if gender == "男" else "女士"
15             email_content += f"to: <{email}>\n"
16             email_content += f"尊敬的{name}{title}, 您的会员资格即将到期, 请及时续费. \n"
17             email_content += "---\n"
18
19         # 输出到 emails.txt 文件
20         with open('emails.txt', 'w', encoding='utf-8') as output_file:
21             output_file.write(email_content)
22
23         print("邮件内容已成功写入 emails.txt 文件.")
24     except FileNotFoundError:
25         print("错误: 未找到 contacts.txt 文件.")
26     except Exception as e:
27         print(f"发生未知错误: {e}")
28
29 if __name__ == "__main__":
30     process_contacts()
```

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)

将大模型提供的代码复制粘贴进 main.py 文件，记得保存

在 VS Code 扩展商店里安装 Python 扩展，使得在编写 .py 文件时能够显示和选择 Python 解释器 (需要绕过防火墙)

在 VS Code 扩展商店里安装 Ruff 扩展，按照文档配置 Ruff，实现在保存 .py 文件时能够自动规范化 Python 代码

运行 python main.py 命令 (作用是启动 Python 解释器，执行 main.py 里的代码直至结束 (EOF) 或报错 (Exception))，检查运行结果是否符合预期

```
MINGW64:/c/Users/86182/reg x + v
$ conda env list
# conda environments:
#
base * D:\anana\damangshe
my-project D:\anana\damangshe\envs\my-project
prj1 D:\anana\damangshe\envs\prj1
prj2 D:\anana\damangshe\envs\prj2
week04 D:\anana\damangshe\envs\week04

(base) 86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ conda activate week04
(week04)
86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ ls -l
total 30
-rw-r--r-- 1 86182 197609 204 3月 29 20:53 contacts.txt
-rw-r--r-- 1 86182 197609 74 3月 29 20:37 environment.yml
-rw-r--r-- 1 86182 197609 18805 3月 29 20:28 LICENSE
-rw-r--r-- 1 86182 197609 1391 3月 29 20:51 main.py
-rw-r--r-- 1 86182 197609 2239 3月 29 20:28 README.md
(week04)
86182@LAPTOP-SC2US6CM 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
(week04)
86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ cat main.py
# 定义函数来处理联系人信息
def process_contacts():
    try:
        # 读取 contacts.txt 文件
        with open('contacts.txt', 'r', encoding='utf-8') as file:
            contacts = file.readlines()

        # 初始化联系人列表
```

```
MINGW64/c/Users/86182/reg x + v
[0]])

# 生成邮件内容
email_content = ""
for name, gender, email in contact_list:
    title = "先生" if gender == "男" else "女士"
    email_content += f"to: <{email}>\n"
    email_content += f"尊敬的{name}{title}, 您的会员资格即将到期, 请
及时续费.\n"
    email_content += "---\n"

# 输出到 emails.txt 文件
with open('emails.txt', 'w', encoding='utf-8') as output_file:
    output_file.write(email_content)

print("邮件内容已成功写入 emails.txt 文件。")
except FileNotFoundError:
    print("错误: 未找到 contacts.txt 文件。")
except Exception as e:
    print(f"发生未知错误: {e}")

if __name__ == "__main__":
    process_contacts()
    (week04)
86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ python main.py
邮件内容已成功写入 emails.txt 文件。
(week04)
86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ ls -l
total 31
-rw-r--r-- 1 86182 197609 204 3月 29 20:53 contacts.txt
-rw-r--r-- 1 86182 197609 666 3月 29 21:21 emails.txt
-rw-r--r-- 1 86182 197609 74 3月 29 20:37 environment.yml
-rw-r--r-- 1 86182 197609 18805 3月 29 20:28 LICENSE
-rw-r--r-- 1 86182 197609 1391 3月 29 20:51 main.py
-rw-r--r-- 1 86182 197609 2239 3月 29 20:28 README.md
(week04)
86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$
```

运行 `python -m pdb main.py` 命令 (作用是以调试模式 (debug mode) 启动 Python 解释器, 准备执行 main.py 里的代码)

```
MINGW64/c/Users/86182/reg x + v
$ 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: <lixiluan@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。
---
(week04)
86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ rm emails.txt
rm: cannot remove 'emails.txt': No such file or directory
(week04)
86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ rm emails.txt
(week04)
86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ ls -l
total 30
-rw-r--r-- 1 86182 197609 204 3月 29 20:53 contacts.txt
-rw-r--r-- 1 86182 197609 74 3月 29 20:37 environment.yml
-rw-r--r-- 1 86182 197609 18805 3月 29 20:28 LICENSE
-rw-r--r-- 1 86182 197609 1391 3月 29 20:51 main.py
-rw-r--r-- 1 86182 197609 2239 3月 29 20:28 README.md
(week04)
86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ python -m pdb main.py
> c:\users\86182\repo\week04\main.py(2)<module>()
-> def process_contacts():
(Pdb)
```

在 (pdb) 提示符下练习使用 l (显示代码)、n (执行当前行)、p (打印表达式)、s (步入调用)、pp (美观打印)、c (继续执行) 等命令 (参考文档)


```
MINGW64:/c/Users/86182/reg × + v
23         email_content += "---\n"
24
25         # 输出到 emails.txt 文件
26         with open('emails.txt', 'w', encoding='utf-8') as output_file:
27             output_file.write(email_content)
28
29             print("邮件内容已成功写入 emails.txt 文件。")
30         except FileNotFoundError:
31             print("错误: 未找到 contacts.txt 文件。")
32         except Exception as e:
33             print(f"发生未知错误: {e}")
34
35
36     -> if __name__ == "__main__":
37         process_contacts()
38
(Pdb) s
> c:\users\86182\repo\week04\main.py(37)<module>()
-> process_contacts()
(Pdb) l .
32         except Exception as e:
33             print(f"发生未知错误: {e}")
34
35
36     if __name__ == "__main__":
37     -> process_contacts()
38
[EOF]
(Pdb) l 30.39
*** Error in argument: '30.39'
(Pdb) l .
32         except Exception as e:
33             print(f"发生未知错误: {e}")
34
35
36     if __name__ == "__main__":
37     -> process_contacts()
38
[EOF]
(Pdb) 
```

```
MINGW64/c/Users/86182/reg x + v
35
36     if __name__ == "__main__":
37 ->     process_contacts()
38
[EOF]
(Pdb) pp
*** SyntaxError: invalid syntax
(Pdb) q
(week04)
86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$ python -m pdb main.py
> c:\users\86182\repo\week04\main.py(2)<module>()
-> def process_contacts():
(Pdb) n
> c:\users\86182\repo\week04\main.py(36)<module>()
-> if __name__ == "__main__":
(Pdb) s
> c:\users\86182\repo\week04\main.py(37)<module>()
-> process_contacts()
(Pdb) l.
32         except Exception as e:
33             print(f"发生未知错误: {e}")
34
35
36     if __name__ == "__main__":
37 ->     process_contacts()
38
[EOF]
(Pdb) pp contacts
*** NameError: name 'contacts' is not defined
(Pdb) l
[EOF]
(Pdb) c
邮件内容已成功写入 emails.txt 文件。
The program finished and will be restarted
> c:\users\86182\repo\week04\main.py(2)<module>()
-> def process_contacts():
(Pdb) q
(week04)
86182@LAPTOP-SC2US6CM MINGW64 ~/repo/week04 (main)
$
```

在调试过程中，利用 wat-inspector (第三方软件包，需要安装) 检查 (inspect) 各种对象 (参考文档)

在调试过程中，观察代码逐步运行的效果，学习理解以下 Python 基本概念 (建议观看下面的录播讲解)

Python 语法保留字 (reserved key words)

语句 (statement) 和表达式 (expression)

缩进 (indent)

局部变量 (local variable)、全局变量 (global variable)、LEGB 规则

函数 (function) 的定义 (define) 和调用 (call)

字面值 (literal) (字符串 (str)、整数 (int)、列表 (list)、字典 (dict)、元组 (tuple))

运算符 (operator)

形参 (parameter)、实参 (argument)、返回值 (return value)

对象 (object)、类型 (type)、属性 (attribute)、方法 (method)