

Anaconda 虚拟环境配置

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教程说明：在已经安装 Python 解释器的情况下，使用 Package 科学管理工具 Anaconda 配置虚拟环境，并在虚拟环境中完成 Python 需要的 Package 安装。

March 19, 2024

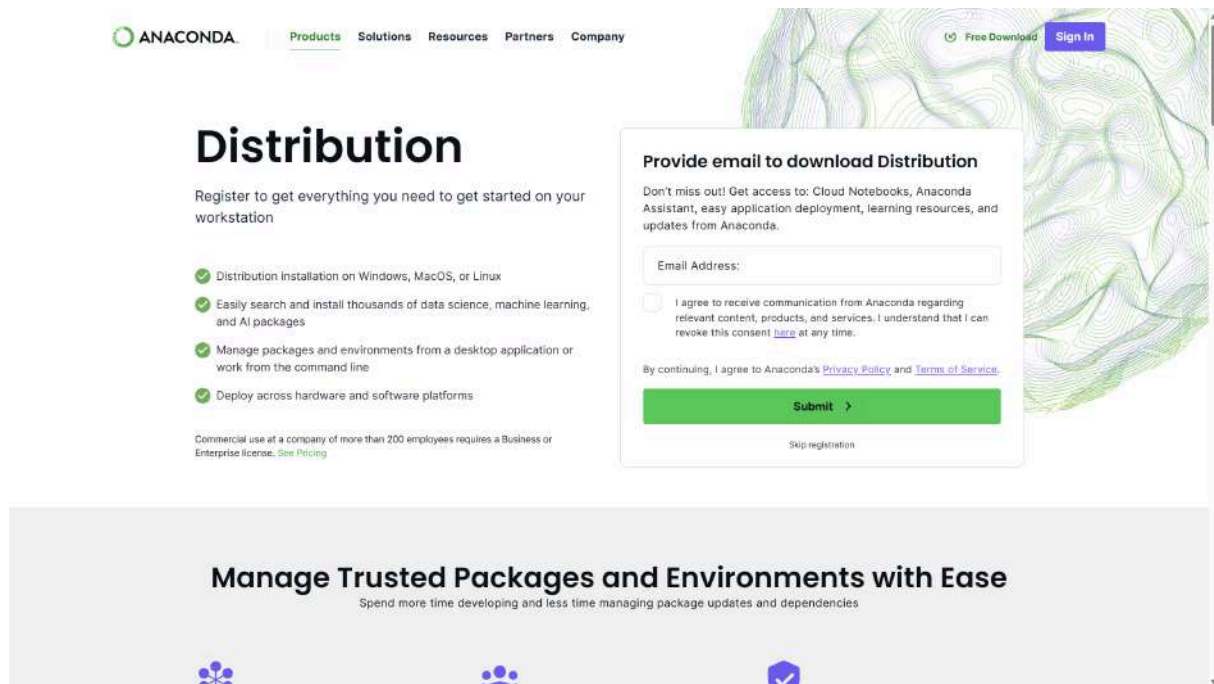
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1. 安装 Anaconda

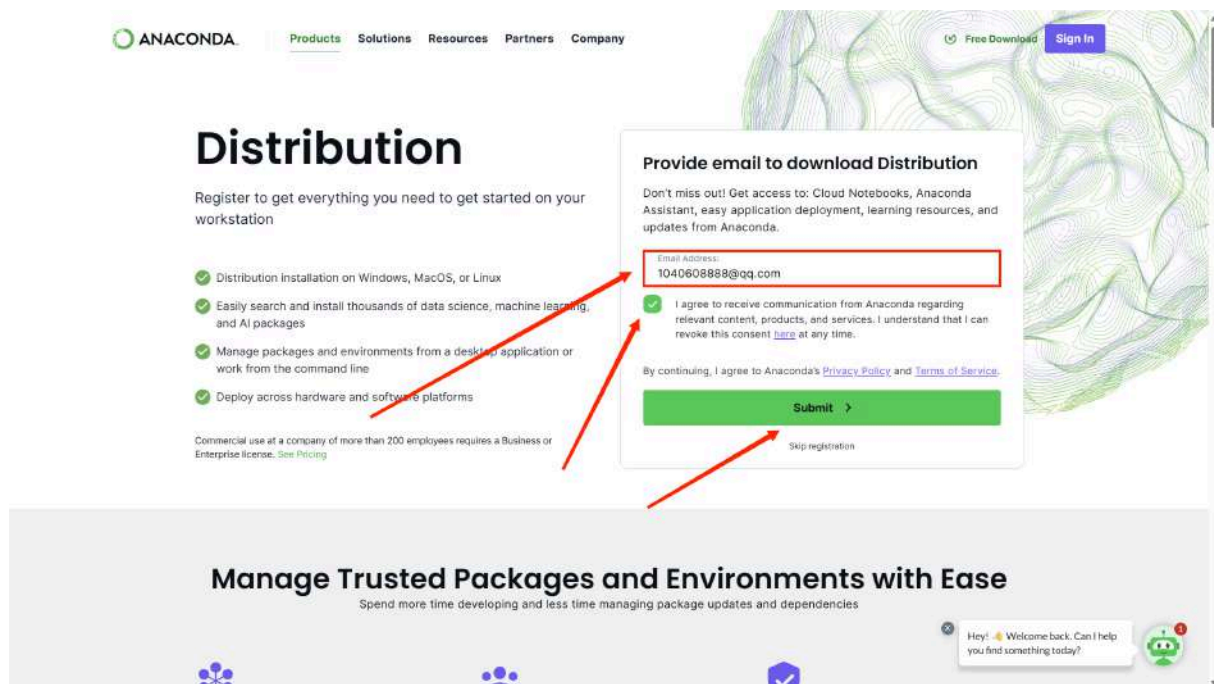
1.1. 打开 Anaconda 官网

在浏览器中打开网址 <https://www.anaconda.com/download/>。



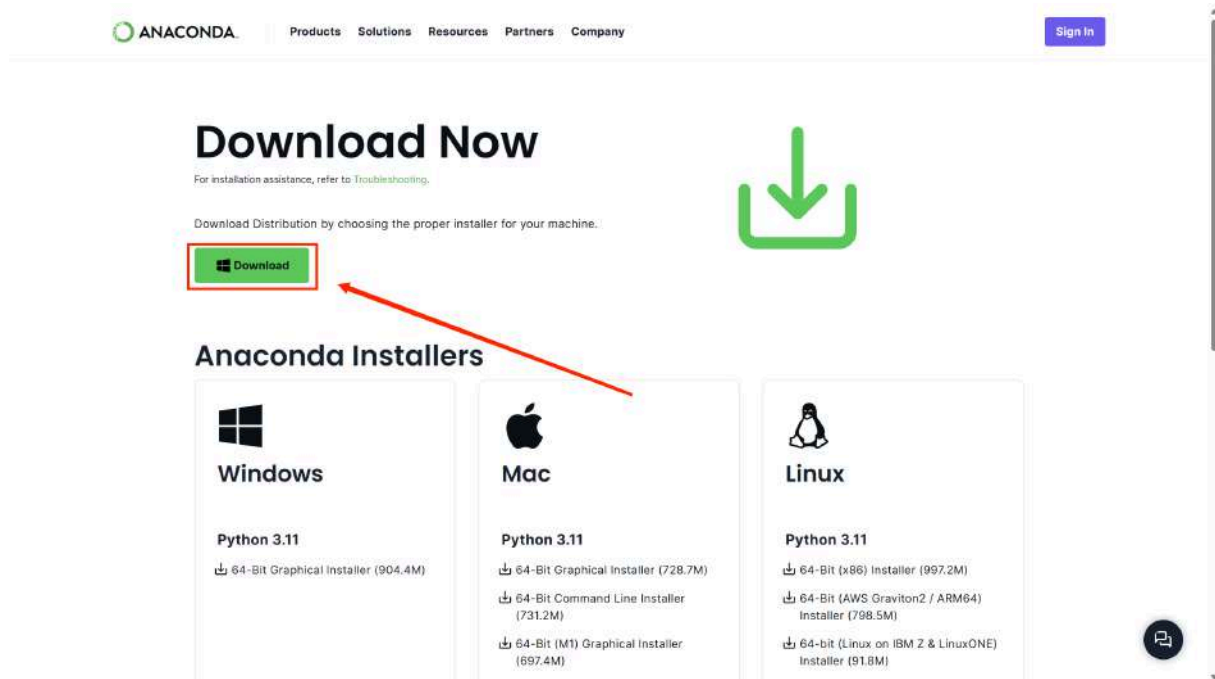
1.2. 完成邮箱注册

在输入框中输入邮箱地址，勾选下方协议，点击 Submit 按钮。

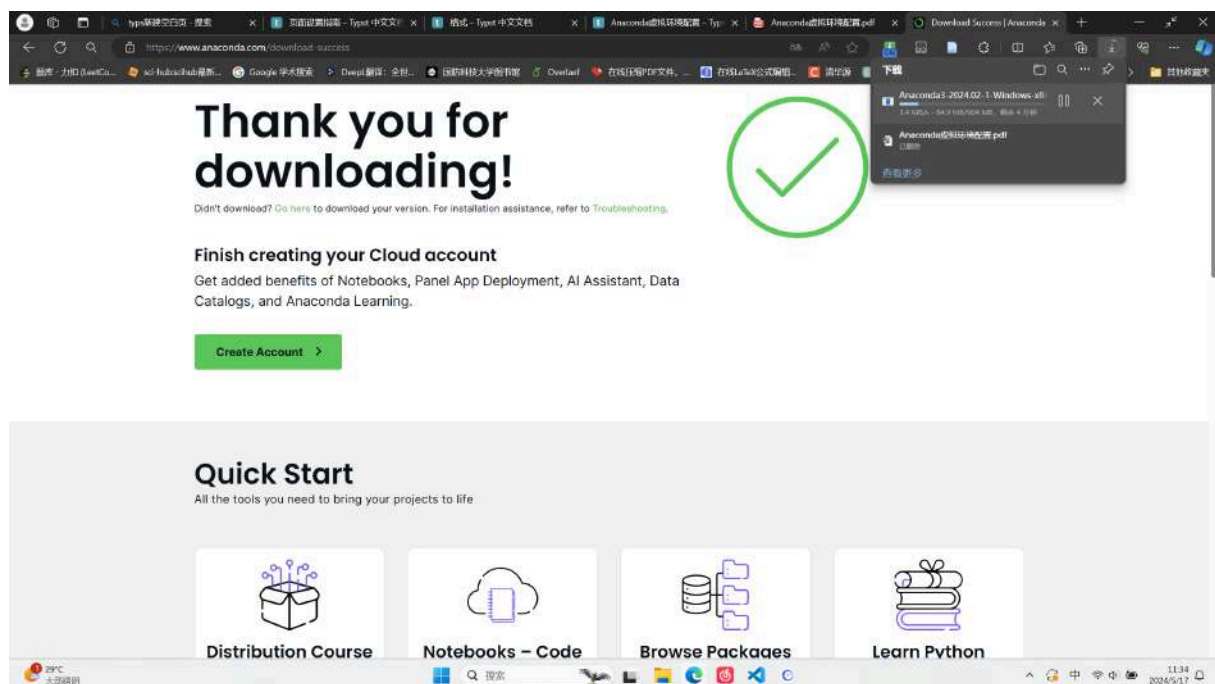


1.3. 下载 Anaconda 安装程序

点击 Download 按钮，自动适应 PC 端操作系统版本下载

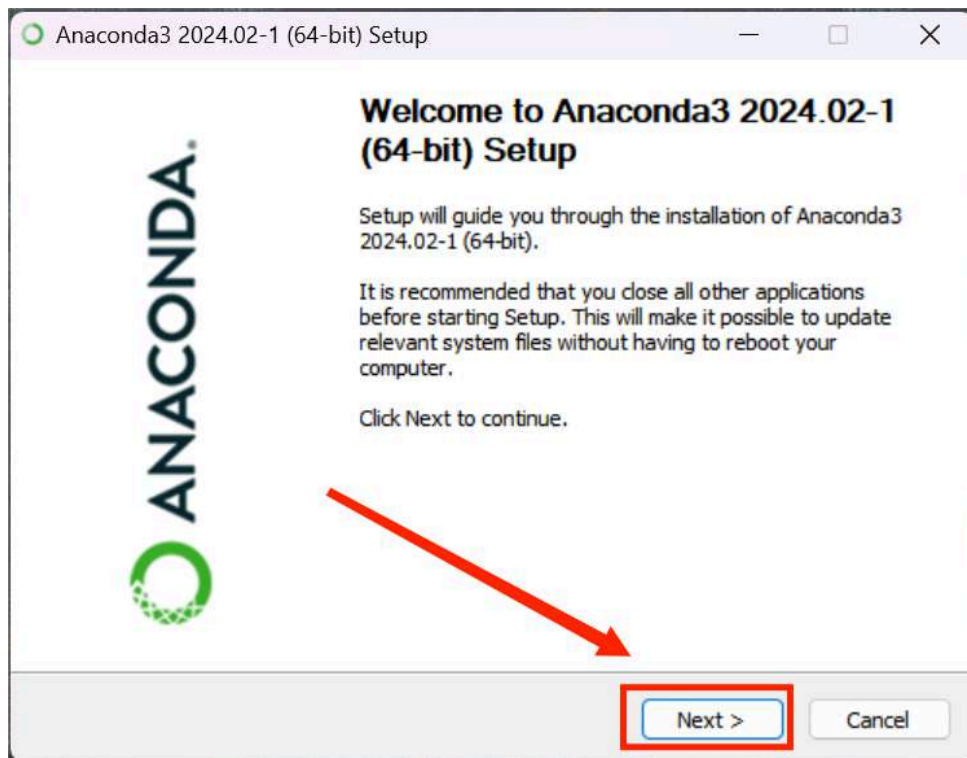


Anaconda 已在浏览器端自动开始下载，软件体积较大，耐心等待下载完成。

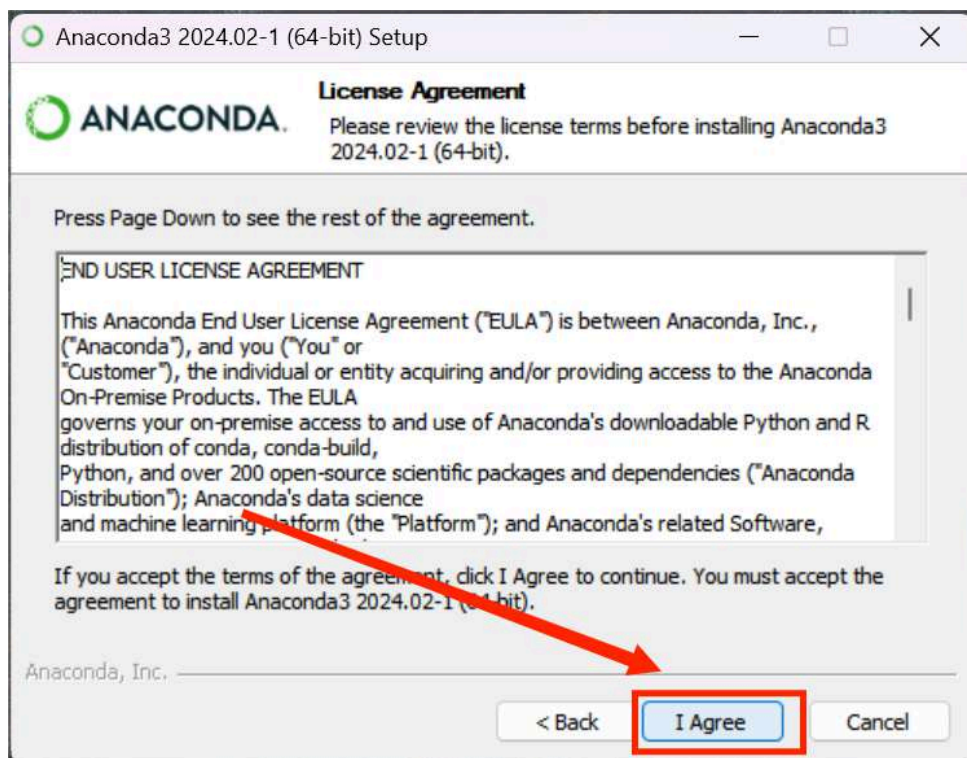


1.4. 配置 Anaconda 安装设置

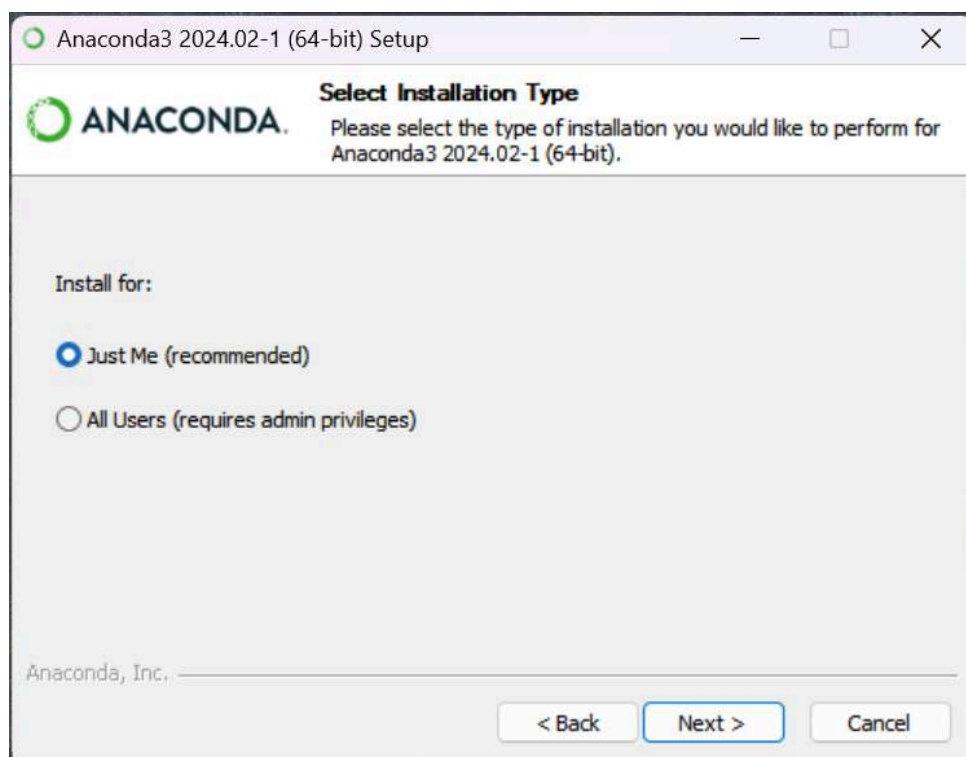
打开下载好的 Anaconda 安装程序，点击“Next”。



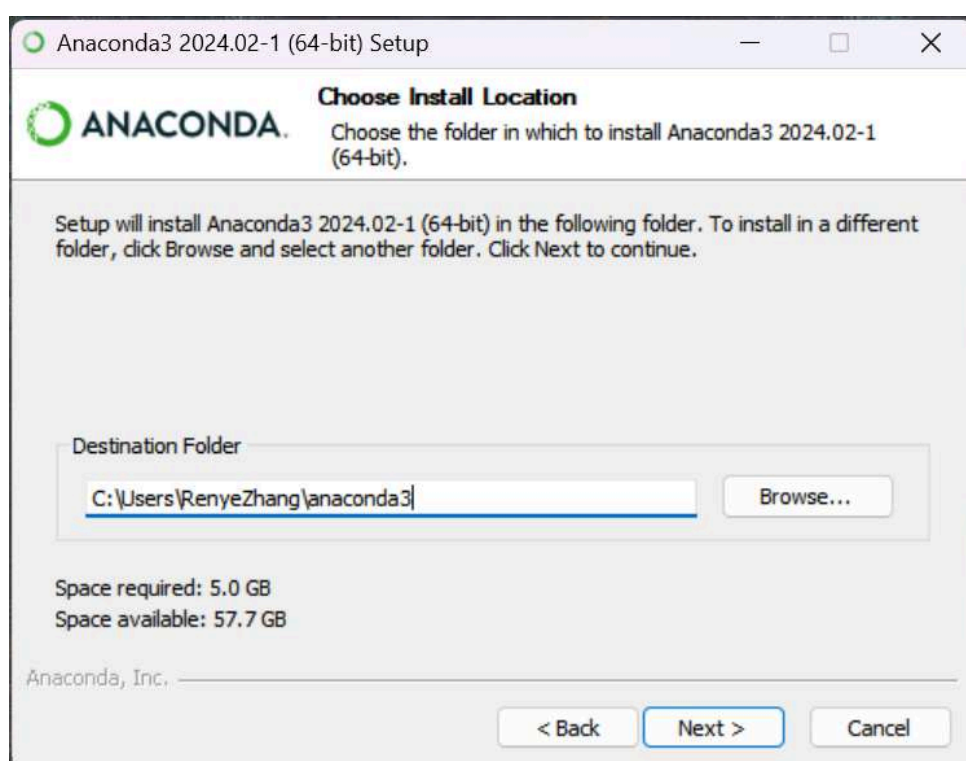
点击“I Agree”。



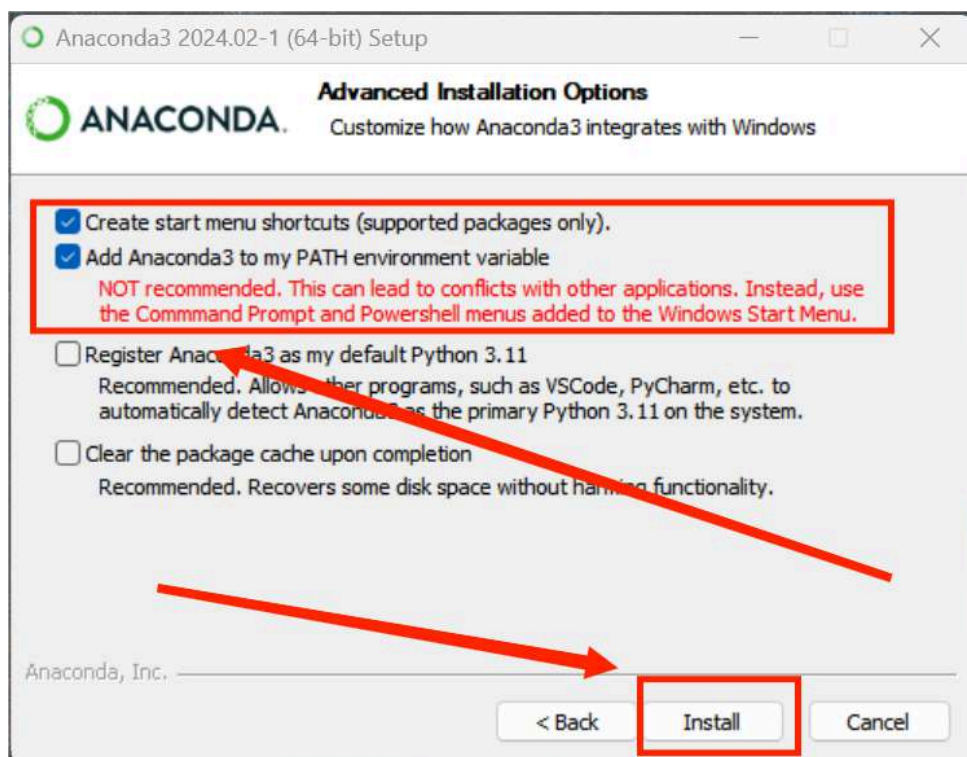
选择“Just Me”，然后点击“Next”。



自行选择安装路径，然后点击“Next”。



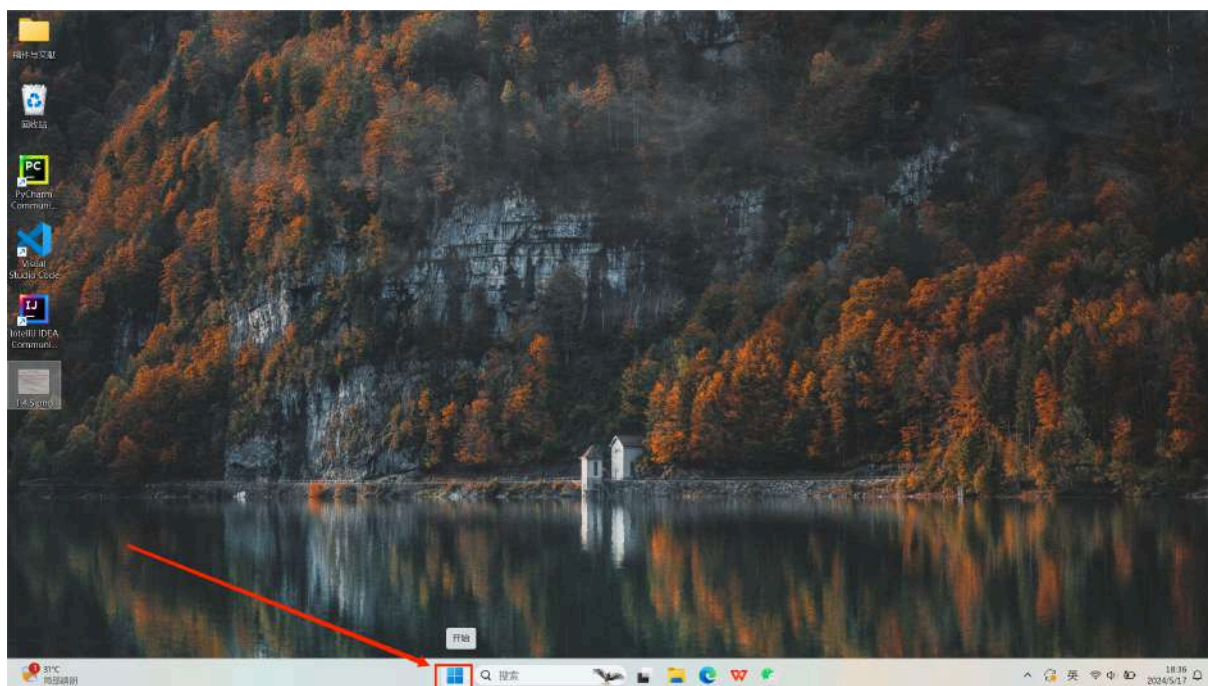
勾选第一项与第二项（勾选第二项确保将 Anaconda 自动添加到环境变量中，方便 IDE 自动识别虚拟环境的文件位置）。然后再点击 Install，即开始安装。



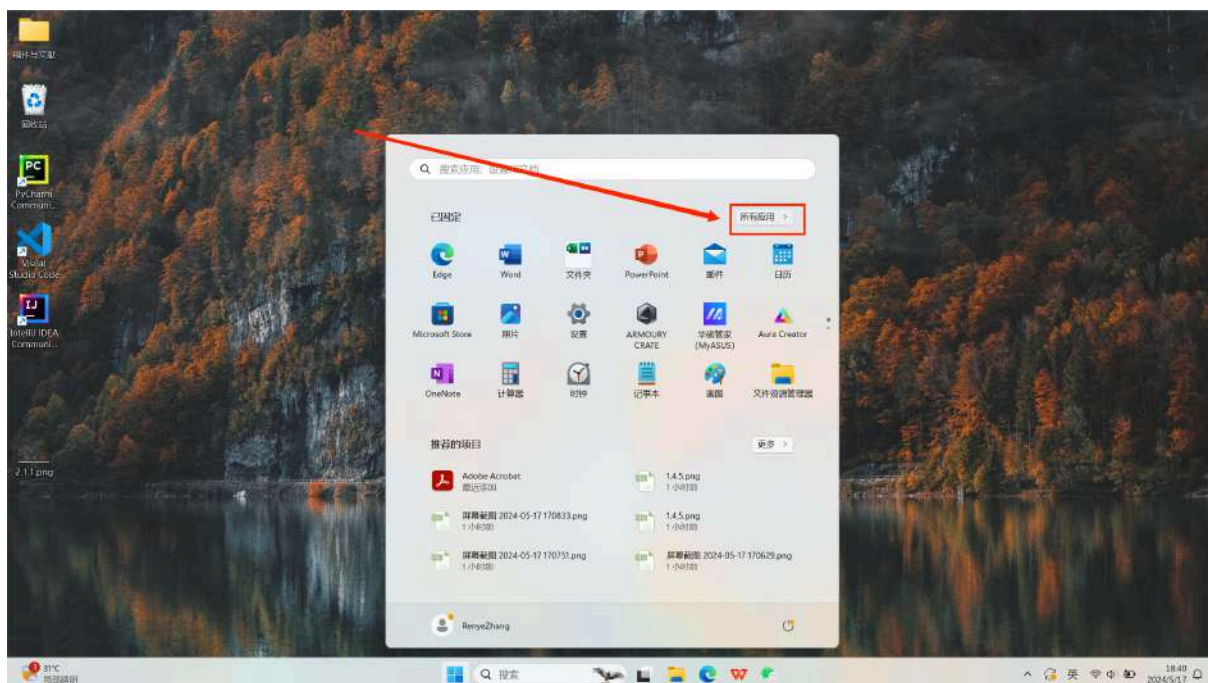
2. 使用 Anaconda 配置虚拟环境

2.1. 打开 Anaconda Prompt

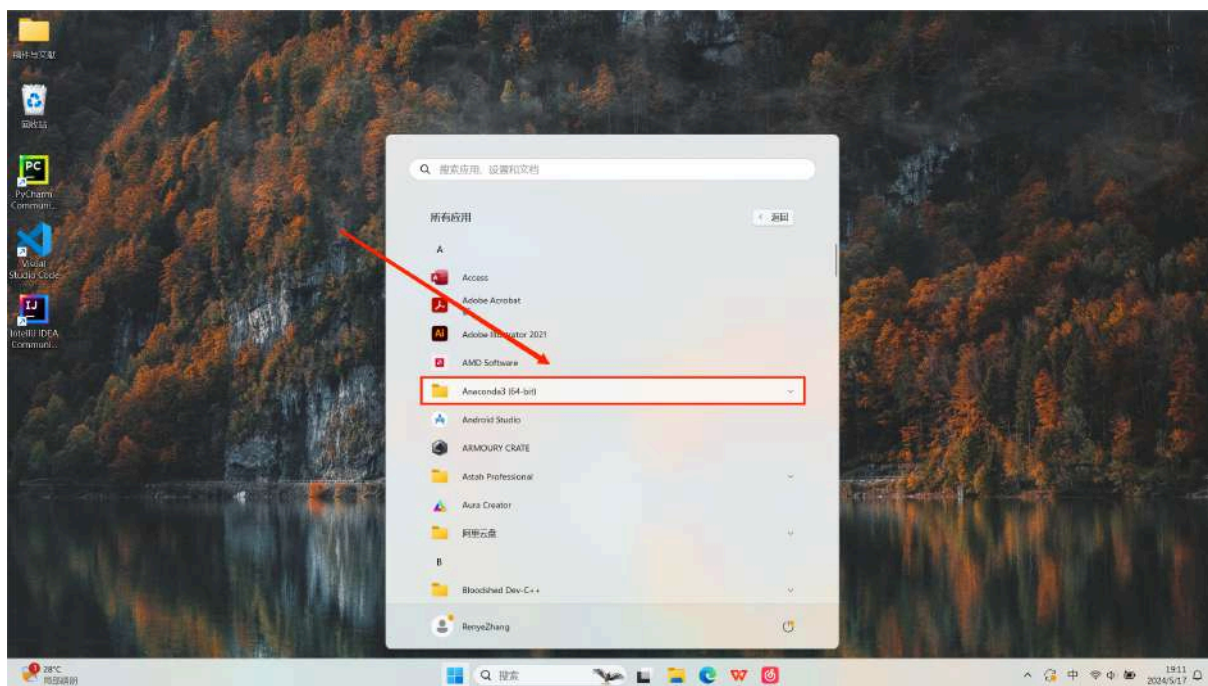
本教程以 Windows 11 操作系统为例。打开桌面的“开始”菜单。



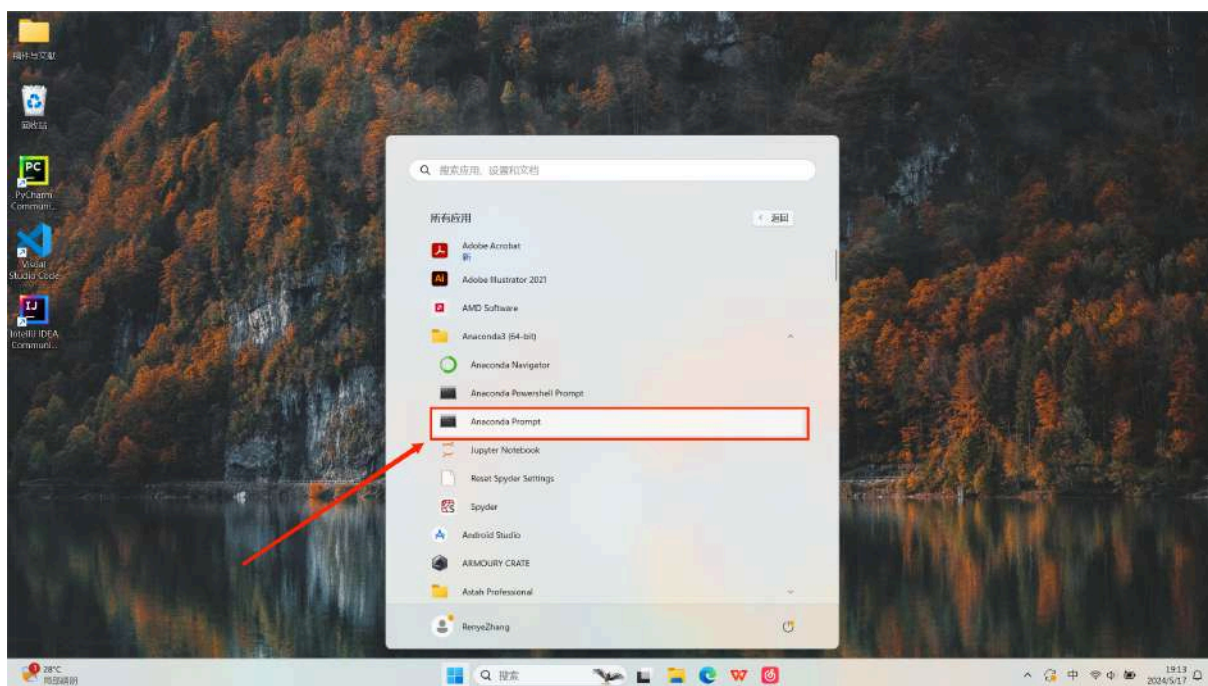
点击“所有应用”。



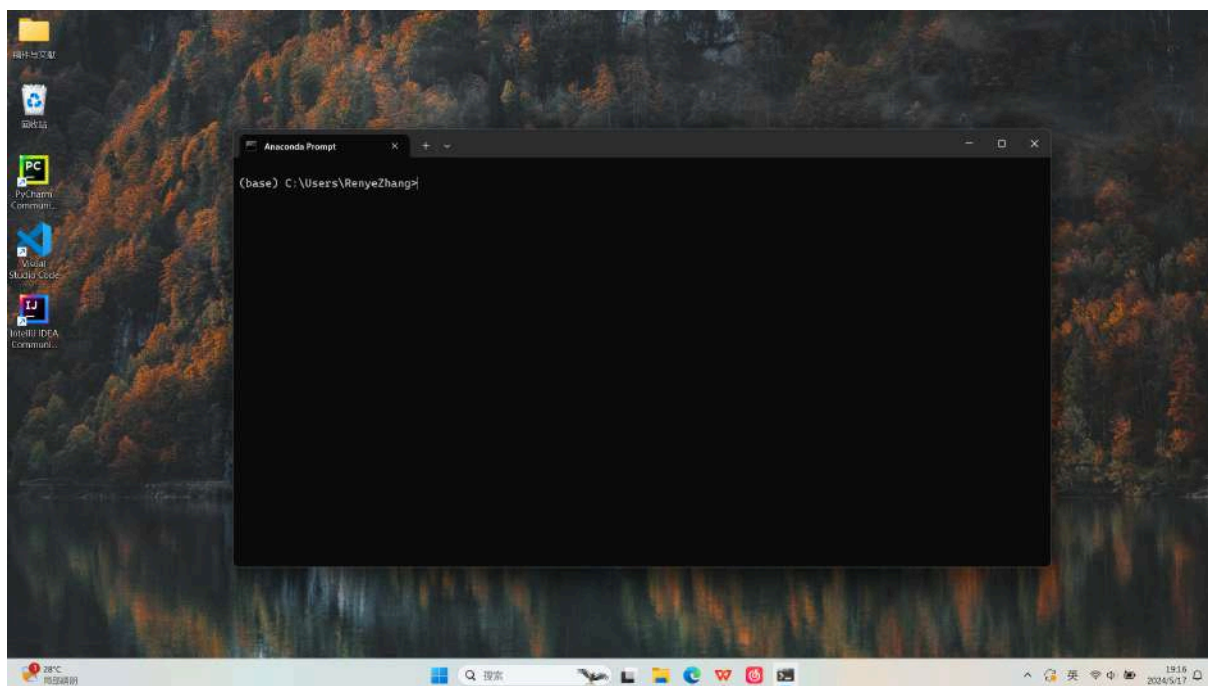
在菜单中找到 Anaconda 相关文件夹并点击。



点击“Anaconda Prompt”。

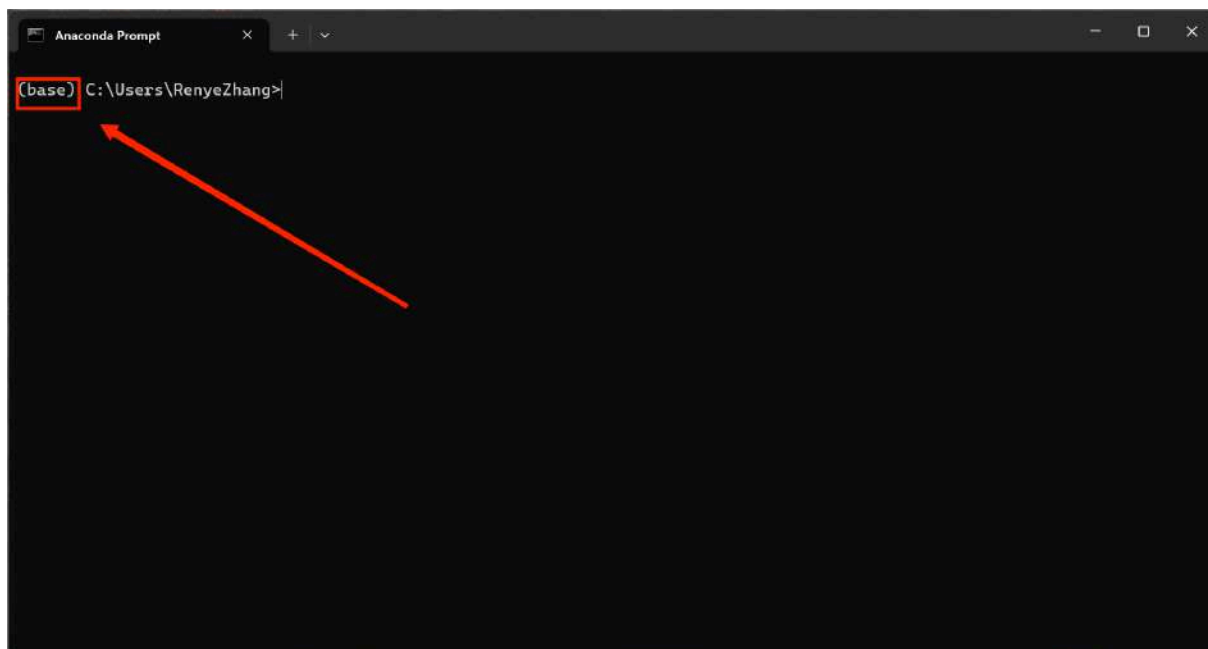


弹出此命令行窗口时，代表成功打开 Anaconda Prompt。



2.2. 创建虚拟环境

Anaconda Prompt 中的第一行内容最左侧括号中标识符表明当前所处环境名称，现在为 Anaconda 自带的名为“base”的基础环境。

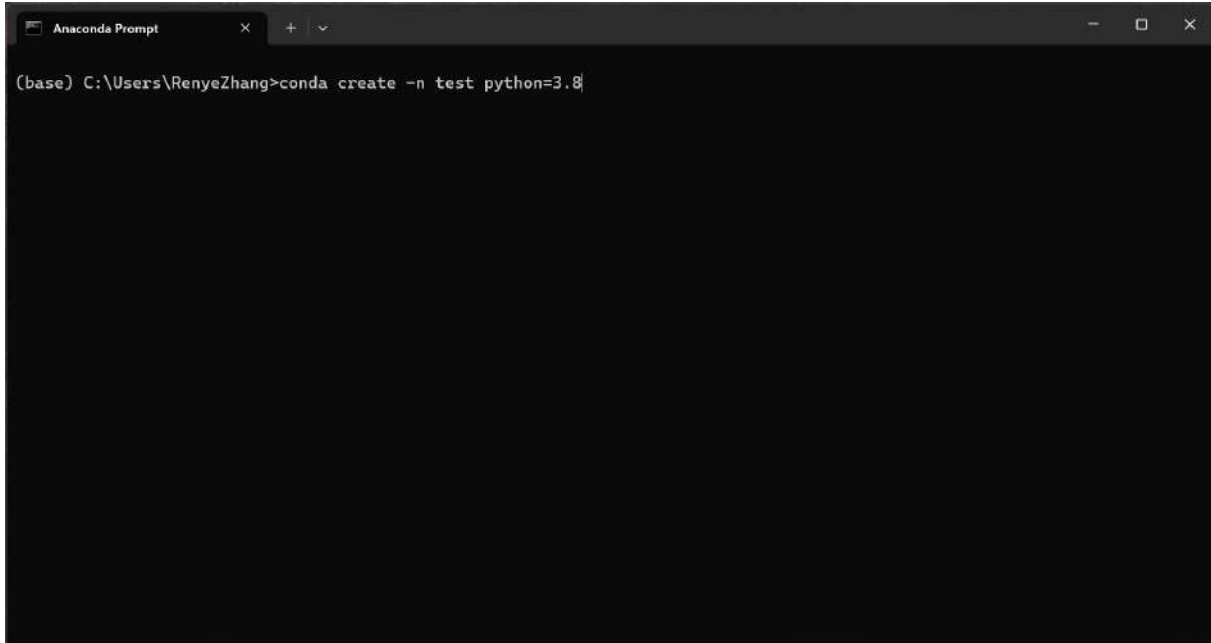


下面使用命令语句进行虚拟环境创建，语句格式如下所示。

```
conda create -n [enviroment_name] python=[x.x]
```

其中[enviroment_name]为虚拟环境的名字，[x.x]为虚拟环境中指定的 Python 版本（该 Python 解释器只在当前安装的虚拟环境下有效）。

输入完命令后，按回车键即可启动命令。

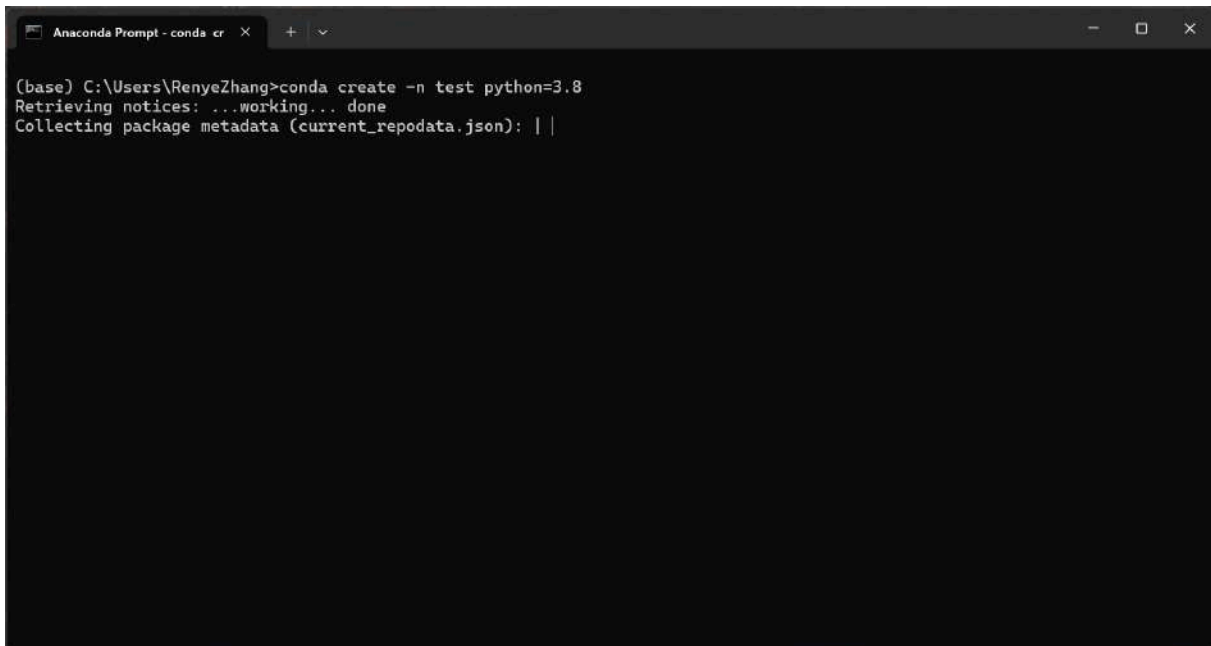
A screenshot of the Anaconda Prompt window. The title bar shows 'Anaconda Prompt' with standard window controls. The command prompt shows the user is in the base environment at C:\Users\RenyeZhang. The command 'conda create -n test python=3.8' has been entered and is ready to be executed.

```

Anaconda Prompt
(base) C:\Users\RenyeZhang>conda create -n test python=3.8

```

出现如下语句，表明 Anaconda 已经开始配置环境。

A screenshot of the Anaconda Prompt window showing the output of the 'conda create' command. The title bar now includes '- conda cr'. The output shows the command being executed, followed by progress messages: 'Retrieving notices: ...working... done' and 'Collecting package metadata (current_repodata.json): | |'.

```

Anaconda Prompt - conda cr
(base) C:\Users\RenyeZhang>conda create -n test python=3.8
Retrieving notices: ...working... done
Collecting package metadata (current_repodata.json): | |

```

此界面展示的是创建此虚拟环境所需的软件包，直接输入 y 然后回车即可。

```
Anaconda Prompt - conda cr X + v
environment location: D:\APP\Anaconda\envs\test

added / updated specs:
- python=3.8

The following packages will be downloaded:

package | build | size | channel
-----|-----|-----|-----
vc-14.2 | h2eaa2aa_1 | 10 KB | defaults
vs2015_runtime-14.29.30133 | h43f2093_3 | 1.1 MB | defaults
-----|-----|-----|-----
Total: | 1.1 MB |

The following NEW packages will be INSTALLED:

ca-certificates | anaconda/pkgs/main/win-64::ca-certificates-2024.3.11-haa95532_0
libffi | anaconda/pkgs/main/win-64::libffi-3.4.4-hd77b12b_1
openssl | anaconda/pkgs/main/win-64::openssl-3.0.13-h2bbff1b_1
pip | anaconda/pkgs/main/win-64::pip-24.0-py38haa95532_0
python | anaconda/pkgs/main/win-64::python-3.8.19-h1aa4202_0
setuptools | anaconda/pkgs/main/win-64::setuptools-69.5.1-py38haa95532_0
sqlite | anaconda/pkgs/main/win-64::sqlite-3.45.3-h2bbff1b_0
vc | anaconda/pkgs/main/win-64::vc-14.2-h2eaa2aa_1
vs2015_runtime | anaconda/pkgs/main/win-64::vs2015_runtime-14.29.30133-h43f2093_3
wheel | anaconda/pkgs/main/win-64::wheel-0.43.0-py38haa95532_0

Proceed ([y]/n)?
```

出现如下进度条时，表示正在自动下载当前虚拟环境所需的软件包。

```
Anaconda Prompt - conda cr X + v

The following packages will be downloaded:

package | build | size | channel
-----|-----|-----|-----
vc-14.2 | h2eaa2aa_1 | 10 KB | defaults
vs2015_runtime-14.29.30133 | h43f2093_3 | 1.1 MB | defaults
-----|-----|-----|-----
Total: | 1.1 MB |

The following NEW packages will be INSTALLED:

ca-certificates | anaconda/pkgs/main/win-64::ca-certificates-2024.3.11-haa95532_0
libffi | anaconda/pkgs/main/win-64::libffi-3.4.4-hd77b12b_1
openssl | anaconda/pkgs/main/win-64::openssl-3.0.13-h2bbff1b_1
pip | anaconda/pkgs/main/win-64::pip-24.0-py38haa95532_0
python | anaconda/pkgs/main/win-64::python-3.8.19-h1aa4202_0
setuptools | anaconda/pkgs/main/win-64::setuptools-69.5.1-py38haa95532_0
sqlite | anaconda/pkgs/main/win-64::sqlite-3.45.3-h2bbff1b_0
vc | anaconda/pkgs/main/win-64::vc-14.2-h2eaa2aa_1
vs2015_runtime | anaconda/pkgs/main/win-64::vs2015_runtime-14.29.30133-h43f2093_3
wheel | anaconda/pkgs/main/win-64::wheel-0.43.0-py38haa95532_0

Proceed ([y]/n)? y

Downloading and Extracting Packages
vc-14.2 | 10 KB | ##### | 100% |
vs2015_runtime-14.29 | 1.1 MB | #####4 | 23% |
```

出现如下语句时，表示虚拟环境安装完成。

```
Anaconda Prompt
libffi      anaconda/pkgs/main/win-64::libffi-3.4.4-hd77b12b_1
openssl     anaconda/pkgs/main/win-64::openssl-3.0.13-h2bbff1b_1
pip         anaconda/pkgs/main/win-64::pip-24.0-py38haa95532_0
python      anaconda/pkgs/main/win-64::python-3.8.19-h1aa4202_0
setuptools  anaconda/pkgs/main/win-64::setuptools-69.5.1-py38haa95532_0
sqlite      anaconda/pkgs/main/win-64::sqlite-3.45.3-h2bbff1b_0
vc          anaconda/pkgs/main/win-64::vc-14.2-h2eaa2aa_1
vs2015_runtime anaconda/pkgs/main/win-64::vs2015_runtime-14.29.30133-h43f2093_3
wheel       anaconda/pkgs/main/win-64::wheel-0.43.0-py38haa95532_0

Proceed ([y]/n)? y

Downloading and Extracting Packages

Preparing transaction: done
Verifying transaction: done
Executing transaction: done
#
# To activate this environment, use
#
#   $ conda activate test
#
# To deactivate an active environment, use
#
#   $ conda deactivate

(base) C:\Users\RenyeZhang>
```

2.3. 启动虚拟环境

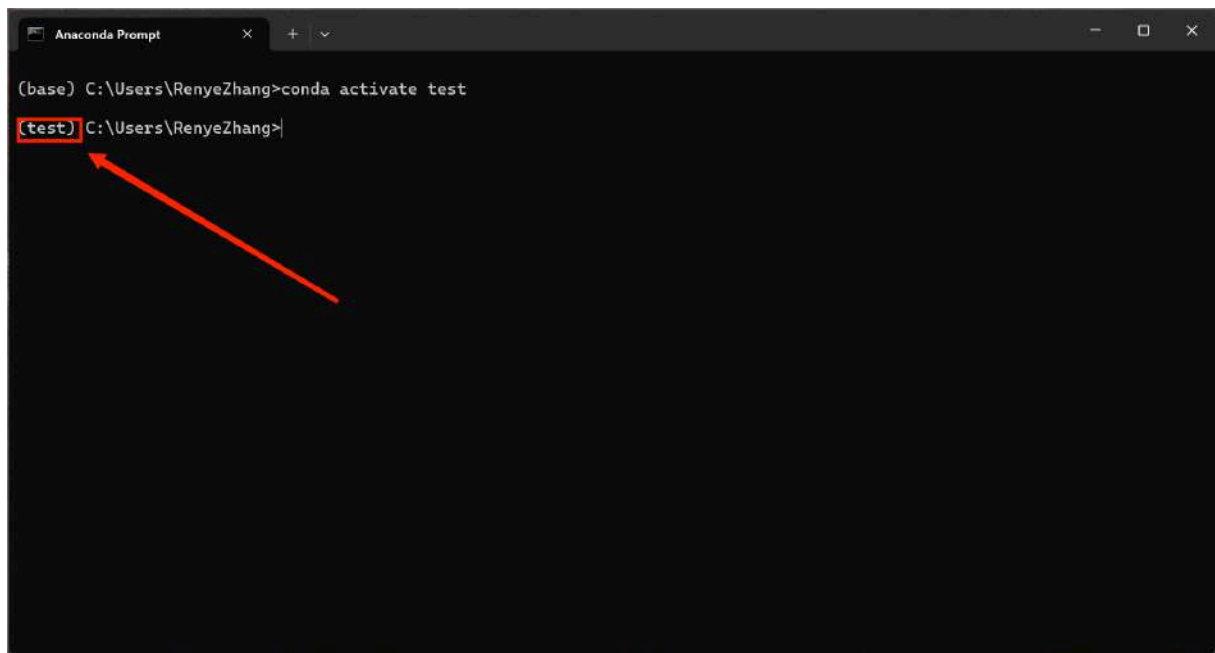
输入格式如下所示的命令，启动名为[enviroment_name]的虚拟环境。

```
conda activate [enviroment_name]
```

```
Anaconda Prompt

(base) C:\Users\RenyeZhang>conda activate test
```


当左侧括号内的环境名称发生改变时，则表示进入到了相应的虚拟环境中。



The screenshot shows the Anaconda Prompt window. The title bar reads 'Anaconda Prompt'. The command prompt shows the command `conda activate test` being executed. The prompt changes from `(base)` to `(test)`, which is highlighted with a red box. A red arrow points from the bottom left towards the `(test)` prompt, indicating the transition to the new environment. The path `C:\Users\RenyeZhang>` is visible on the line following the prompt.

```
Anaconda Prompt
(base) C:\Users\RenyeZhang>conda activate test
(test) C:\Users\RenyeZhang>
```

3. 在虚拟环境中安装软件包

当 Anaconda Prompt 界面已经进入到虚拟环境后，通常使用两种方式在虚拟环境内进行安装包的安装，pip 与 conda，下面分别介绍这两种方式。

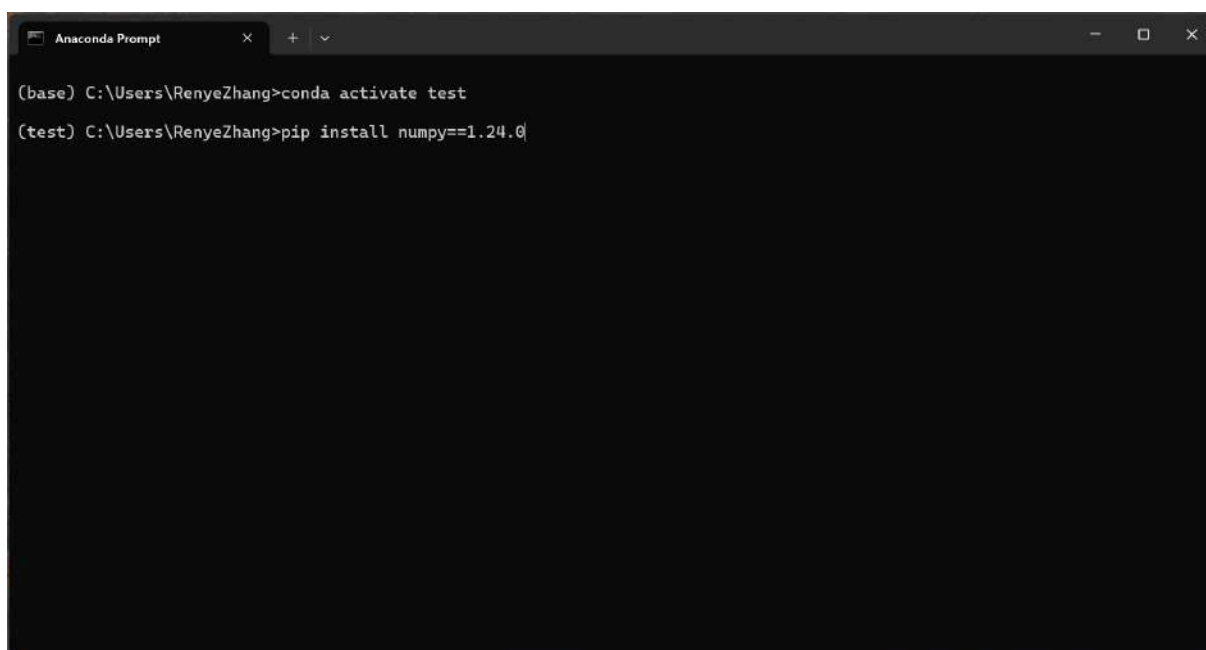
3.1. pip 命令安装

以软件包 numpy 为例，输入以下命令即可安装。

```
pip install numpy
```

如果要指定软件包的版本，输入以下命令。其中[x.x.x]为软件包的具体命令。

```
pip install numpy==[x.x.x]
```



```
Anaconda Prompt
(base) C:\Users\RenyeZhang>conda activate test
(test) C:\Users\RenyeZhang>pip install numpy==1.24.0
```

出现如下语句时，表示软件包正在安装。

```
Anaconda Prompt - pip insta X + | v
(base) C:\Users\RenyeZhang>conda activate test
(test) C:\Users\RenyeZhang>pip install numpy==1.24.0
Looking in indexes: https://pypi.tuna.tsinghua.edu.cn/simple
Collecting numpy==1.24.0
  Downloading https://pypi.tuna.tsinghua.edu.cn/packages/6c/19/7166677b4372c04f107d73333cf7e40abff36d16dc4e58c417e87e47d276/numpy-1.24.0-cp38-cp38-win_amd64.whl (14.9 MB)
    11.6/14.9 MB 11.7 MB/s eta 0:00:01
```

出现如下语句时，表示软件包安装完成。

```
Anaconda Prompt X + | v
(base) C:\Users\RenyeZhang>conda activate test
(test) C:\Users\RenyeZhang>pip install numpy==1.24.0
Looking in indexes: https://pypi.tuna.tsinghua.edu.cn/simple
Collecting numpy==1.24.0
  Downloading https://pypi.tuna.tsinghua.edu.cn/packages/6c/19/7166677b4372c04f107d73333cf7e40abff36d16dc4e58c417e87e47d276/numpy-1.24.0-cp38-cp38-win_amd64.whl (14.9 MB)
    14.9/14.9 MB 11.1 MB/s eta 0:00:00
Installing collected packages: numpy
Successfully installed numpy-1.24.0
(test) C:\Users\RenyeZhang>
```

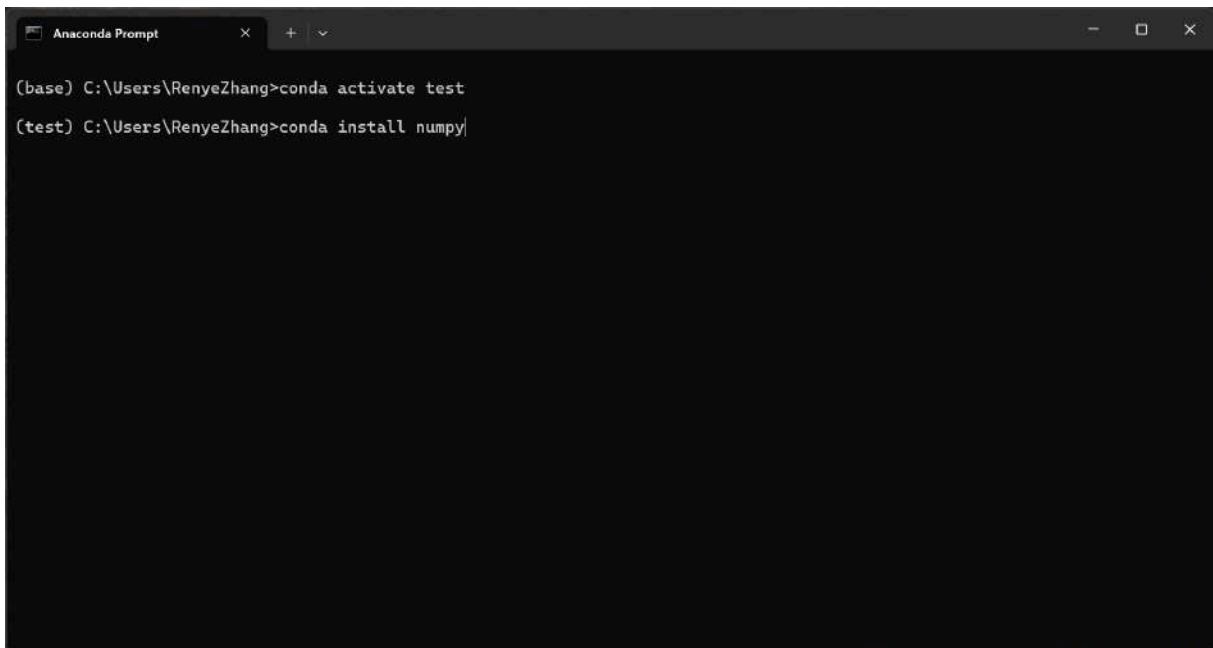
3.2. conda 命令安装

以软件包 `numpy` 为例，输入以下命令即可安装。

```
conda install numpy
```

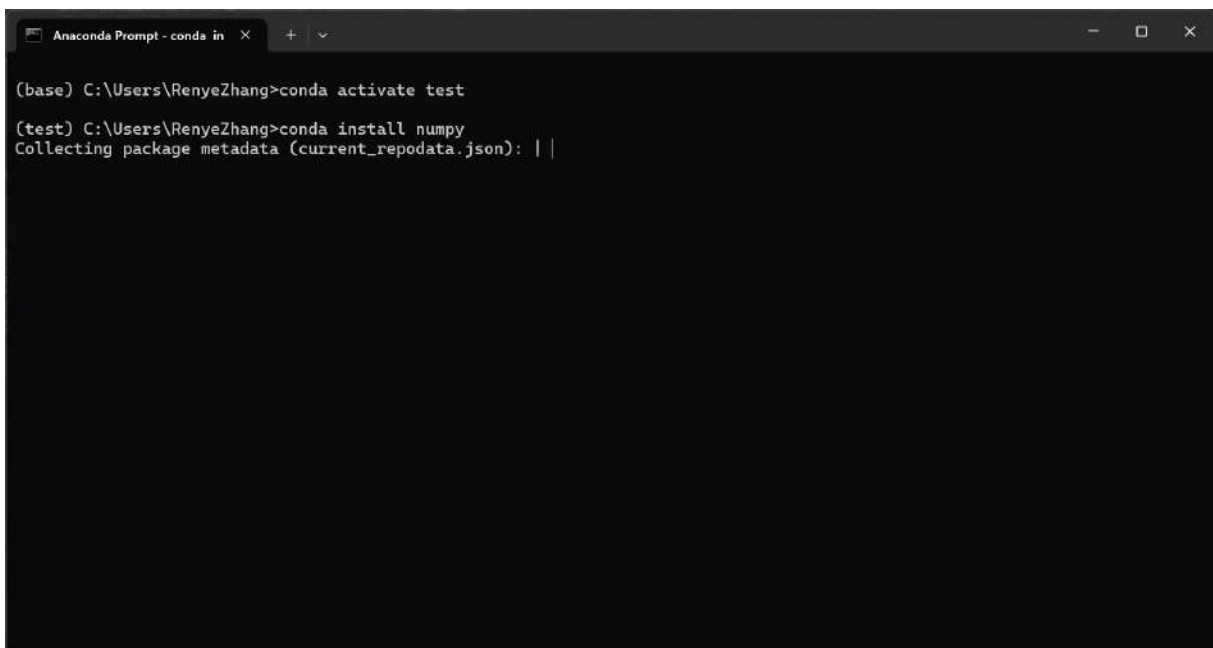
如果要指定软件包的版本，输入以下命令。其中 `[x.x.x]` 为软件包的具体命令。

```
conda install numpy==[x.x.x]
```



```
Anaconda Prompt
(base) C:\Users\RenyeZhang>conda activate test
(test) C:\Users\RenyeZhang>conda install numpy|
```

出现如下语句时，表示正在自动从相关联网资源中搜寻该软件包。



```
Anaconda Prompt - conda in
(base) C:\Users\RenyeZhang>conda activate test
(test) C:\Users\RenyeZhang>conda install numpy
Collecting package metadata (current_repodata.json): | |
```

出现如下界面时，输入 y 再回车即可。

```
Anaconda Prompt - conda in X + | v
(base) C:\Users\RenyeZhang>conda activate test
(test) C:\Users\RenyeZhang>conda install numpy
Collecting package metadata (current_repodata.json): done
Solving environment: done

## Package Plan ##

  environment location: D:\APP\Anaconda\envs\test

  added / updated specs:
    - numpy

The following NEW packages will be INSTALLED:

blas                anaconda/pkgs/main/win-64::blas-1.0-mkl
intel-openmp        anaconda/pkgs/main/win-64::intel-openmp-2023.1.0-h59b6b97_46320
mkl                 anaconda/pkgs/main/win-64::mkl-2023.1.0-h6b88ed4_46358
mkl-service         anaconda/pkgs/main/win-64::mkl-service-2.4.0-py38h2bbff1b_1
mkl_fft             anaconda/pkgs/main/win-64::mkl_fft-1.3.8-py38h2bbff1b_0
mkl_random          anaconda/pkgs/main/win-64::mkl_random-1.2.4-py38h59b6b97_0
numpy               anaconda/pkgs/main/win-64::numpy-1.24.3-py38h79a8e48_1
numpy-base         anaconda/pkgs/main/win-64::numpy-base-1.24.3-py38h8a87ada_1
tbb                 anaconda/pkgs/main/win-64::tbb-2021.8.0-h59b6b97_0

Proceed ([y]/n)?
```

出现如下语句时，表示该软件包安装完成。

```
Anaconda Prompt - conda in X + | v
(base) C:\Users\RenyeZhang>conda activate test
(test) C:\Users\RenyeZhang>conda install numpy
Collecting package metadata (current_repodata.json): done
Solving environment: done

## Package Plan ##

  environment location: D:\APP\Anaconda\envs\test

  added / updated specs:
    - numpy

The following NEW packages will be INSTALLED:

blas                anaconda/pkgs/main/win-64::blas-1.0-mkl
intel-openmp        anaconda/pkgs/main/win-64::intel-openmp-2023.1.0-h59b6b97_46320
mkl                 anaconda/pkgs/main/win-64::mkl-2023.1.0-h6b88ed4_46358
mkl-service         anaconda/pkgs/main/win-64::mkl-service-2.4.0-py38h2bbff1b_1
mkl_fft             anaconda/pkgs/main/win-64::mkl_fft-1.3.8-py38h2bbff1b_0
mkl_random          anaconda/pkgs/main/win-64::mkl_random-1.2.4-py38h59b6b97_0
numpy               anaconda/pkgs/main/win-64::numpy-1.24.3-py38h79a8e48_1
numpy-base         anaconda/pkgs/main/win-64::numpy-base-1.24.3-py38h8a87ada_1
tbb                 anaconda/pkgs/main/win-64::tbb-2021.8.0-h59b6b97_0

Proceed ([y]/n)?
```


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