Deep Learning

Setting up the environment

Deep Learning

- Python is crucial for most major deep learning frameworks and is widely popular in both academia and industry

- In the following course we will be managing environments and packages with **conda** and working with **Jupyter notebook** for organized and easy to handle code

- This should help to get you started, although all information is available online

Python

- The official website of Python is http://www.python.org
- It contains full and easy-to-follow instructions for downloading and installing Python
- In addition, there are many useful Python libraries for machine learning and data science
- Conda is an easy way to download and manage those libraries and much more

Conda (why we need python environments)

- Some python applications may need different versions of packages than the ones you are currently using
- The correct way to handle such situations is by using **environments**
- We will use a popular environment manager called **conda**
- Conda is also a package manager (allows you to install additional packages)

Installing conda

- Conda installer: miniconda / anaconda
  - Miniconda: includes conda and few basic packages
  - Anaconda: includes conda, many scientific packages and a GUI

- Platform: multiple OS - 64 / 32 bit
- Python version: install conda for python 3.7

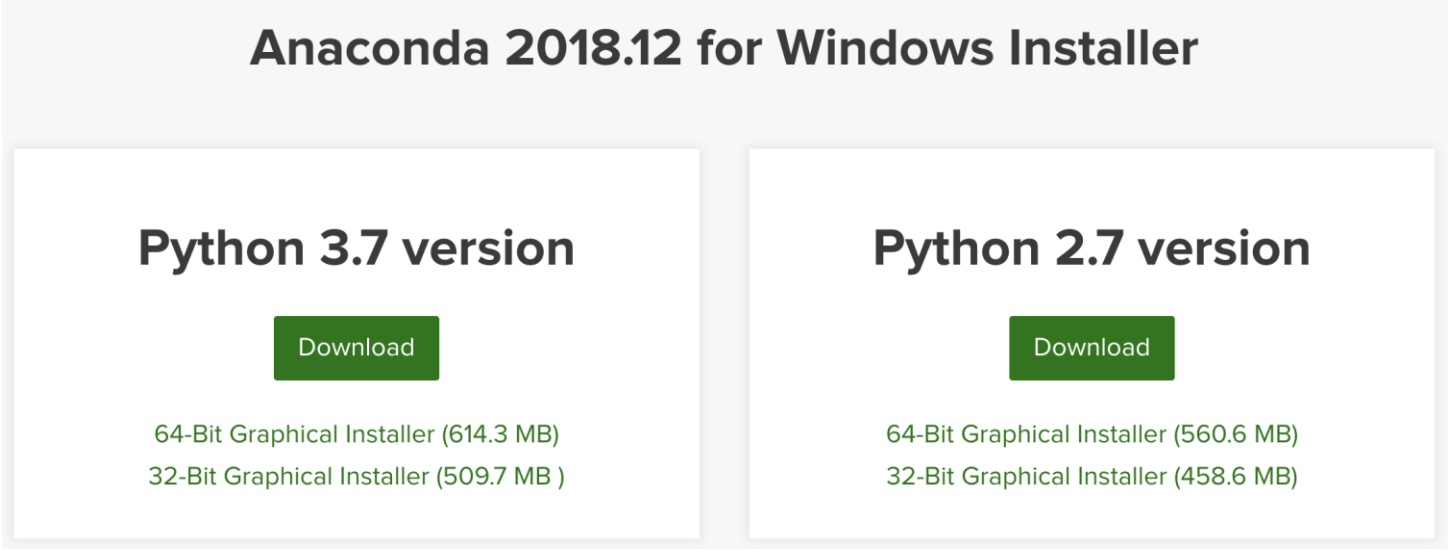
- It is recommended you install **Anaconda**

Anaconda

- Anaconda is the most popular Python data science platform
- Anaconda is a distribution of the Python and R programming languages for data science and machine learning related applications
- It also installs the Jupyter Notebook
- Includes a collection of over 1,000 open source data science packages
- Package versions are managed by the package management system conda

Installing Anaconda

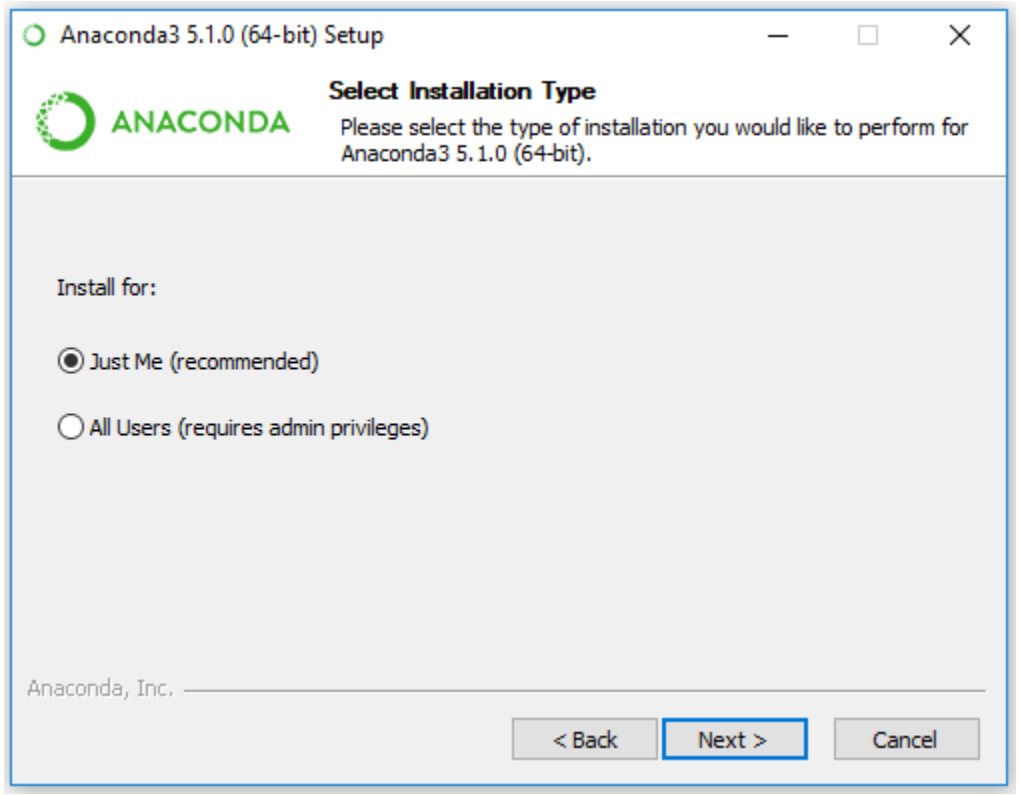
- Go to https://www.anaconda.com/download/
- Download the Python 3.7 version



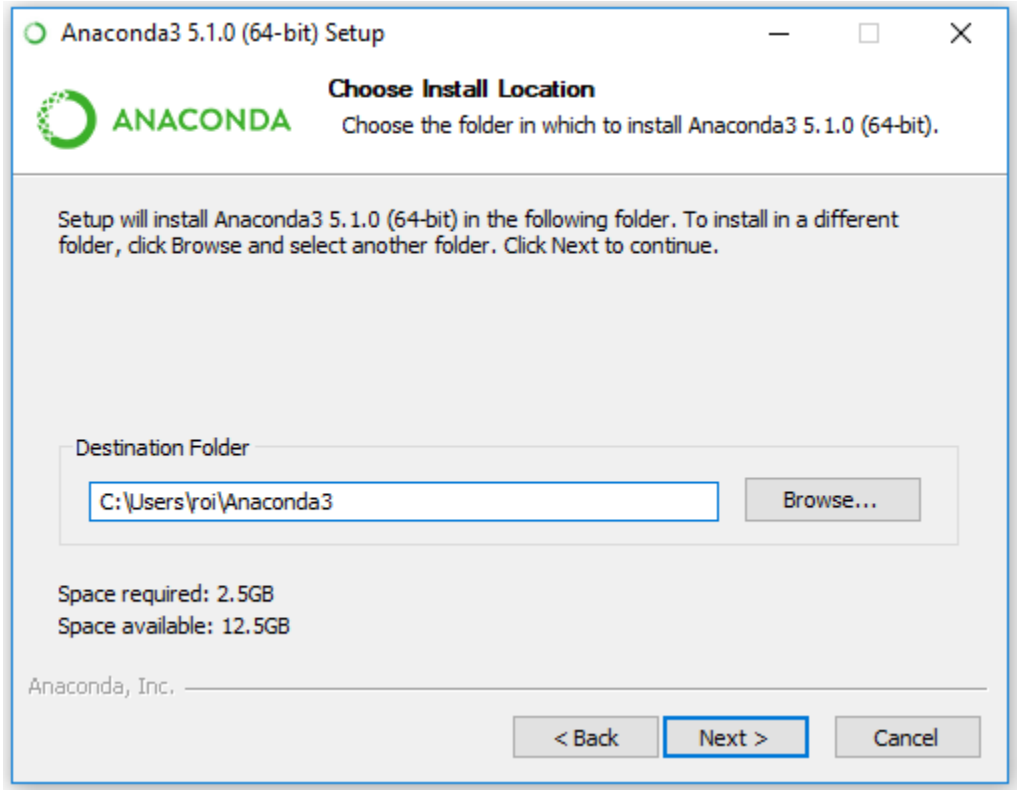
Installing Anaconda

- Double click the executable file to start the installation

Installing Anaconda

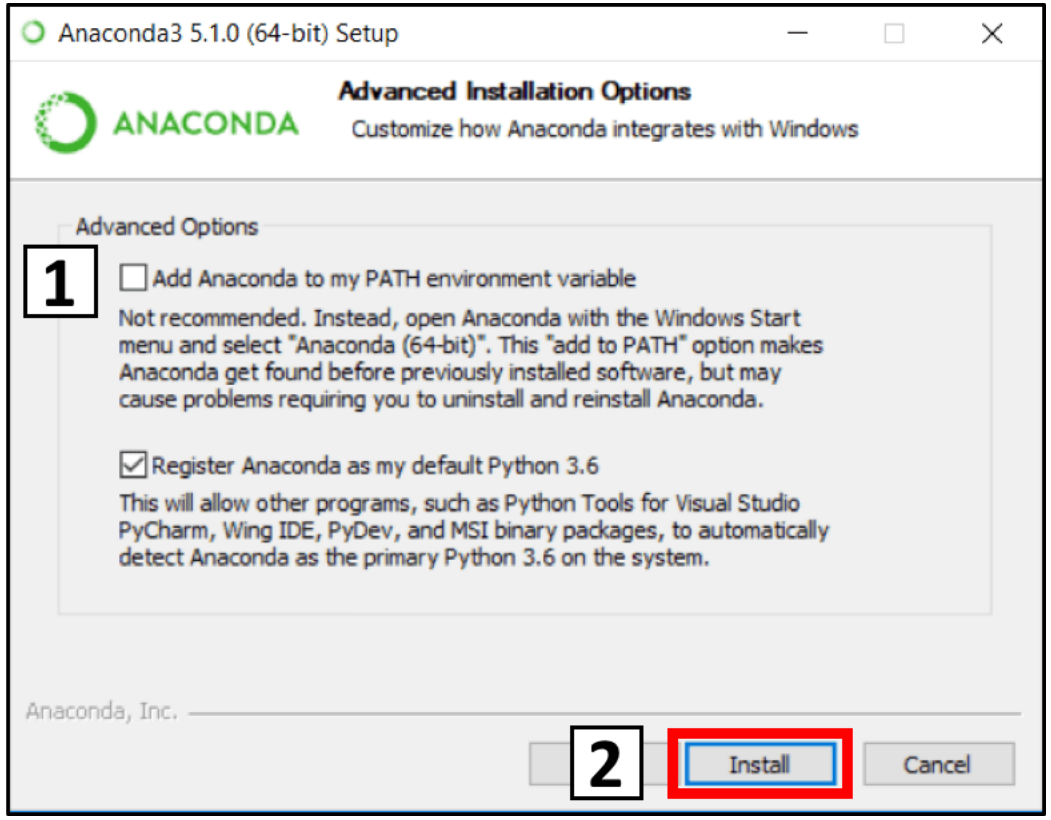


Installing Anaconda

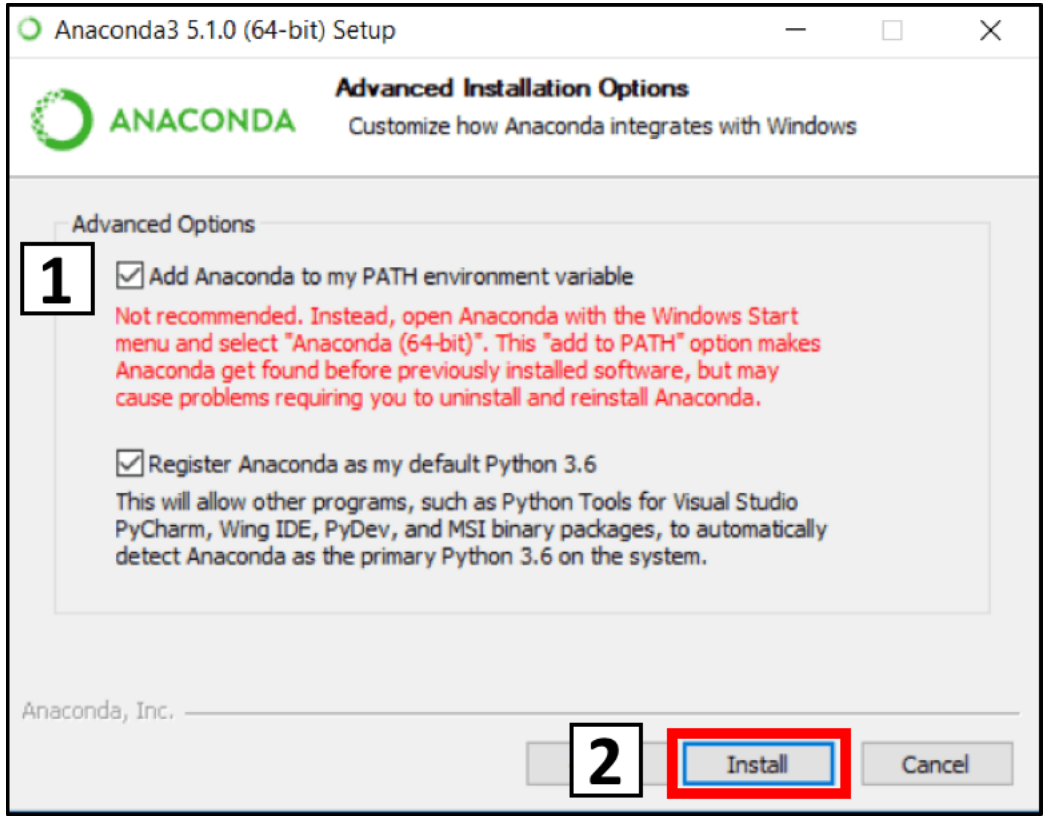


Installing Anaconda

Recommended Approach



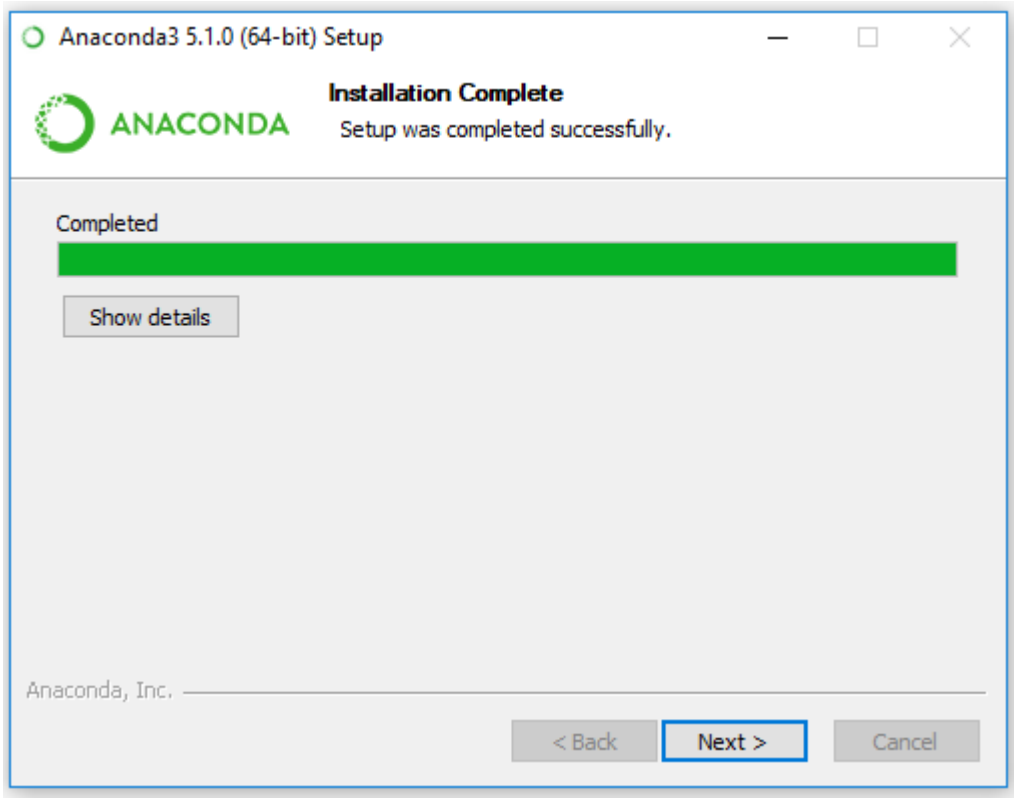
Alternative Approach



Installing Anaconda

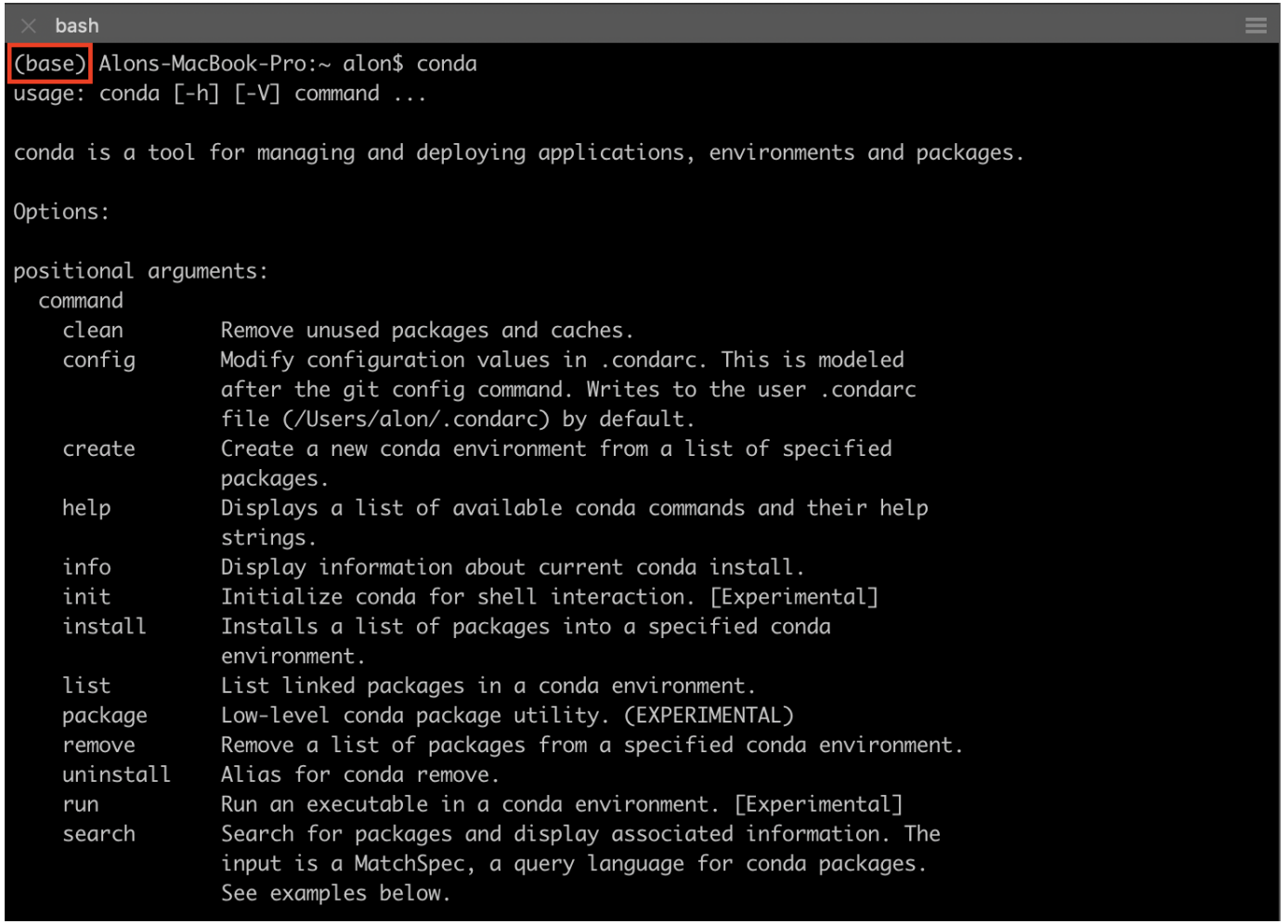
- The recommended approach is to not check the box to add Anaconda to your path. This means you will have to use Anaconda Navigator or the Anaconda Command Prompt (located in the Start Menu under "Anaconda") when you wish to use Anaconda (you can always add Anaconda to your PATH later if you don't check the box). If you want to be able to use Anaconda in your command prompt (or git bash, cmder, powershell etc), please use the alternative approach and check the box

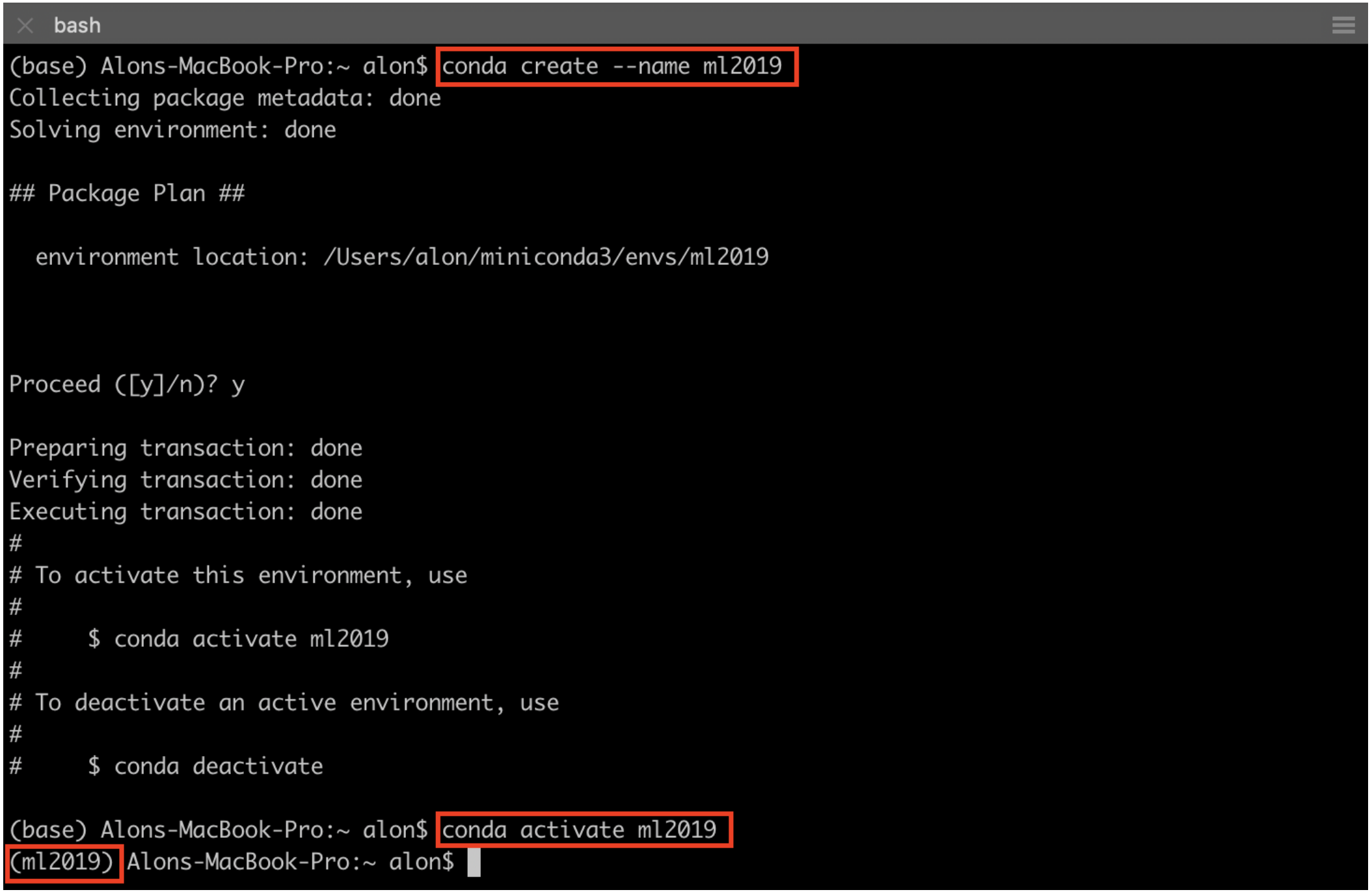
Installing Anaconda



Setting up the environment

- Miniconda / Anaconda sets up two things for you: **Conda** and the **root environment**




bash
(base) Alons-MacBook-Pro:~ alon$ conda create --name ml2019
Collecting package metadata: done
Solving environment: done
Package Plan
environment location: /Users/alon/miniconda3/envs/ml2019
Proceed ([y]/n)? y
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
To activate this environment, use
$ conda activate ml2019
To deactivate an active environment, use
$ conda deactivate
(base) Alons-MacBook-Pro:~ alon$ conda activate ml2019
(ml2019) Alons-MacBook-Pro:~ alon$

Environment management

- You don’t have to use environments (but its recommended that you do)
- If you are missing a package, just google “conda package_name”
- Most packages we will use in this course are available through conda

- For now, make sure the following packages are installed in the new environment you just created:
  - jupyter
  - numpy
  - pandas
  - matplotlib

IDE (integrated development environment)

- **Sublime**
- **PyCharm**
- Atom
- Spyder

- You can get free support for the first two (from me)

Jupyter notebook

- “The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text. Uses include: data cleaning and transformation, numerical simulation, statistical modeling, data visualization, machine learning, and much more”

- conda install -c anaconda jupyter

Jupyter notebook

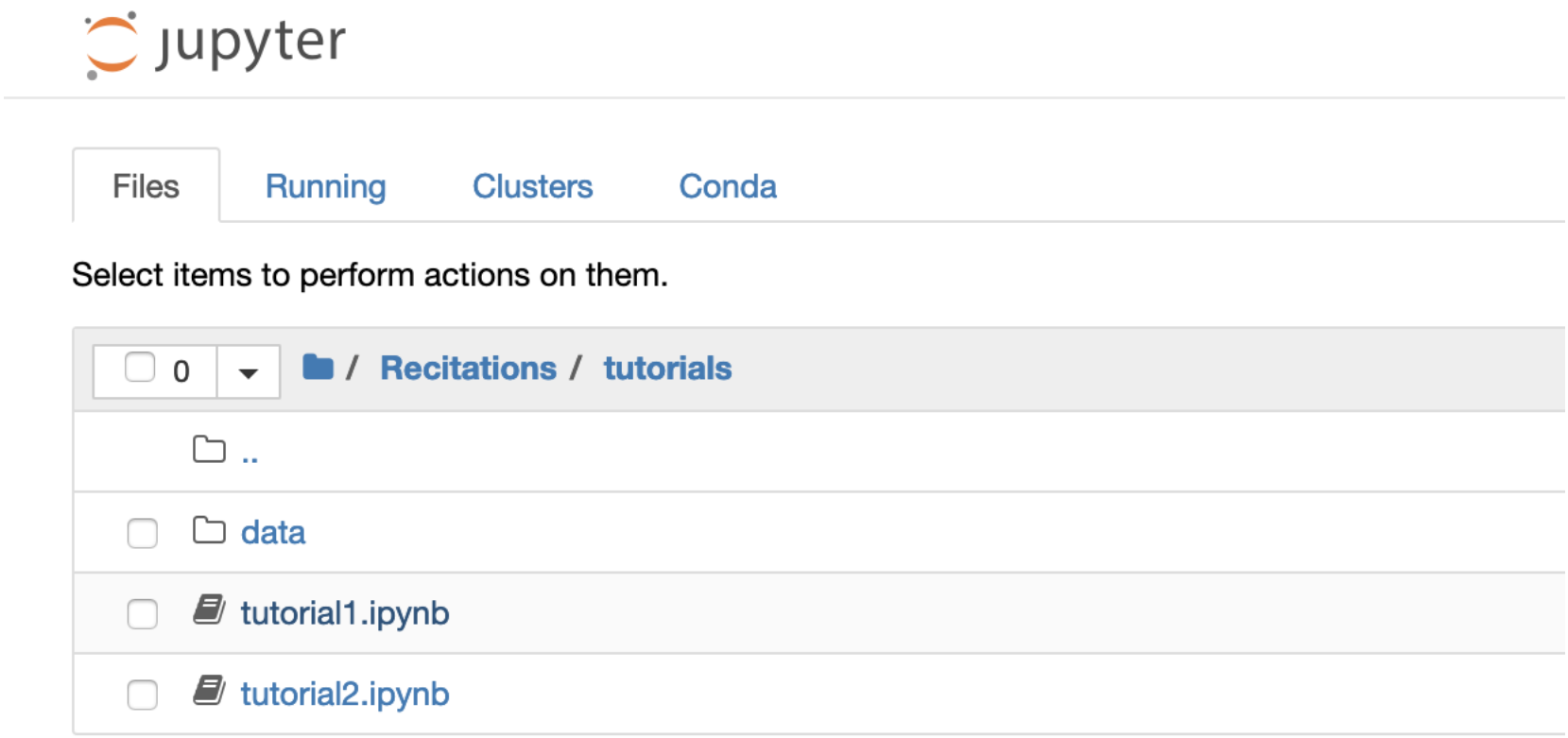
- After installing jupyter, you can activate it by running
- $ jupyter notebook
- This will create a local server on your machine which you can access from your browser, usually from http://localhost:8888

Jupyter notebook

```
(ml2019) Alons-MacBook-Pro:IDC_ML_Economy alon$ jupyter notebook
[I 20:25:48.994 NotebookApp] [nb_conda_kernels] enabled, 4 kernels found
[I 20:25:49.482 NotebookApp] [nb_conda] enabled
[I 20:25:49.483 NotebookApp] Serving notebooks from local directory: /Users/alon/Dropbox/IDC
_ML_Economy
[I 20:25:49.483 NotebookApp] The Jupyter Notebook is running at:
[I 20:25:49.483 NotebookApp] http://localhost:8888/?token=dd9b6ab57df755e71cc67a24fd08d9ffe5
2ab7ec782b0bd4
[I 20:25:49.483 NotebookApp] Use Control-C to stop this server and shut down all kernels (tw
ice to skip confirmation).
[C 20:25:49.489 NotebookApp]

    To access the notebook, open this file in a browser:
        file:///Users/alon/Library/Jupyter/runtime/nbserver-10657-open.html
    Or copy and paste one of these URLs:
        http://localhost:8888/?token=dd9b6ab57df755e71cc67a24fd08d9ffe52ab7ec782b0bd4
```

Jupyter notebook

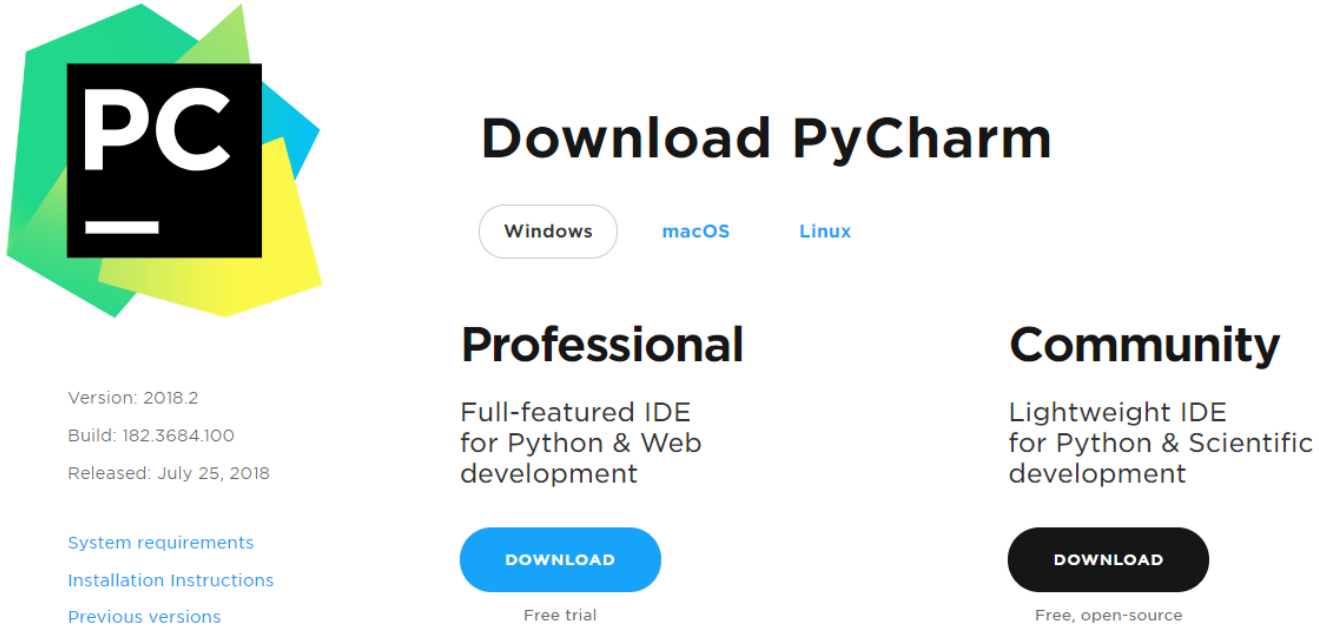


PyCharm

- PyCharm is an IDE for the Python language developed by JetBrains
- PyCharm support all major platforms
- PyCharm integrates with Jupyter Notebook, has an interactive Python console, and supports Anaconda as well as multiple scientific packages including matplotlib and NumPy
- It provides code analysis, a graphical debugger, an integrated unit tester, integration with version control systems like git, and supports web development
- It provides a free Community Edition

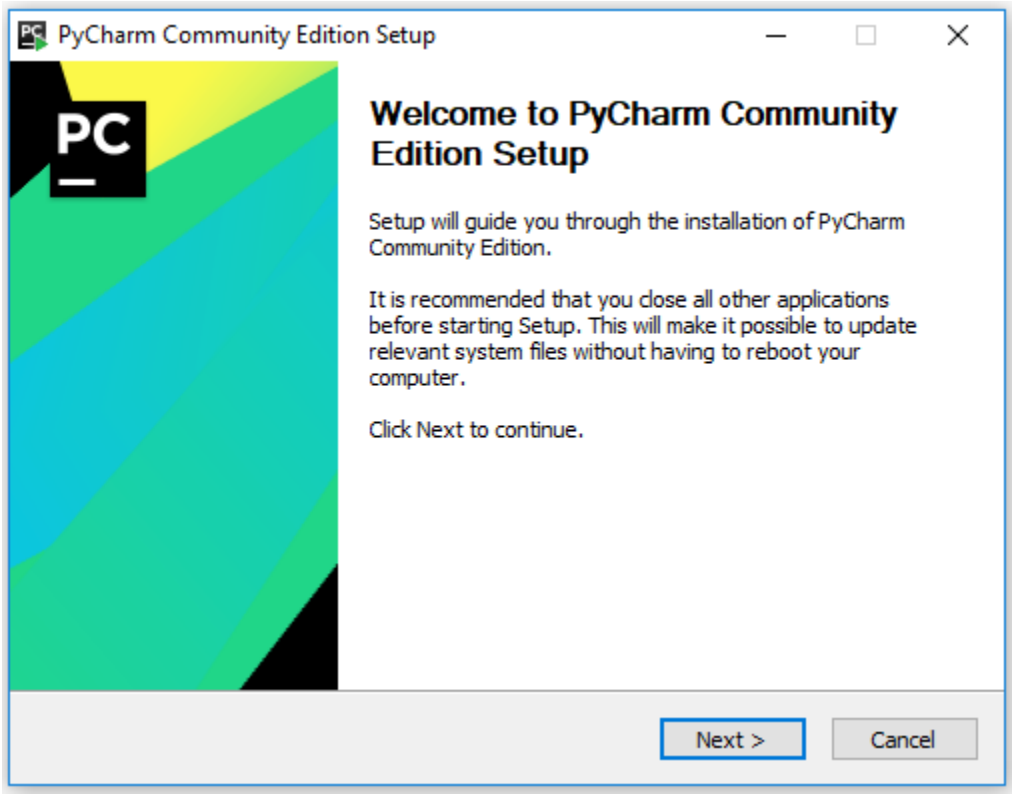
Installing PyCharm

- Go to https://www.jetbrains.com/pycharm/download
- Choose your operating system
- Download

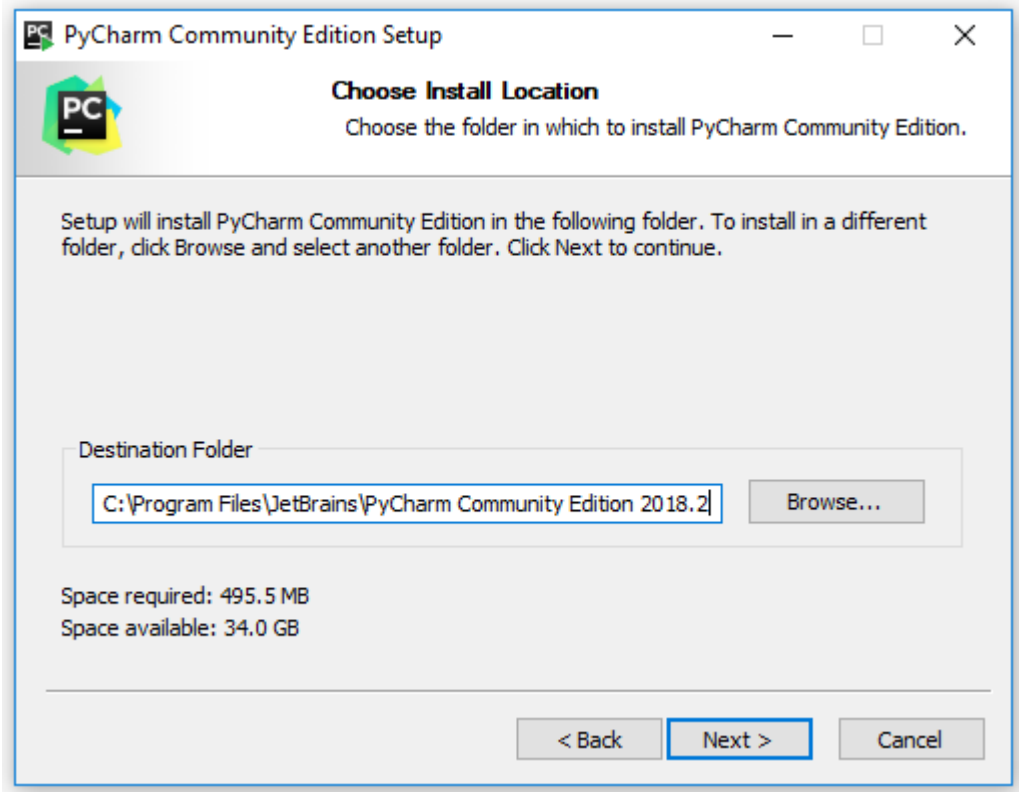


Installing PyCharm

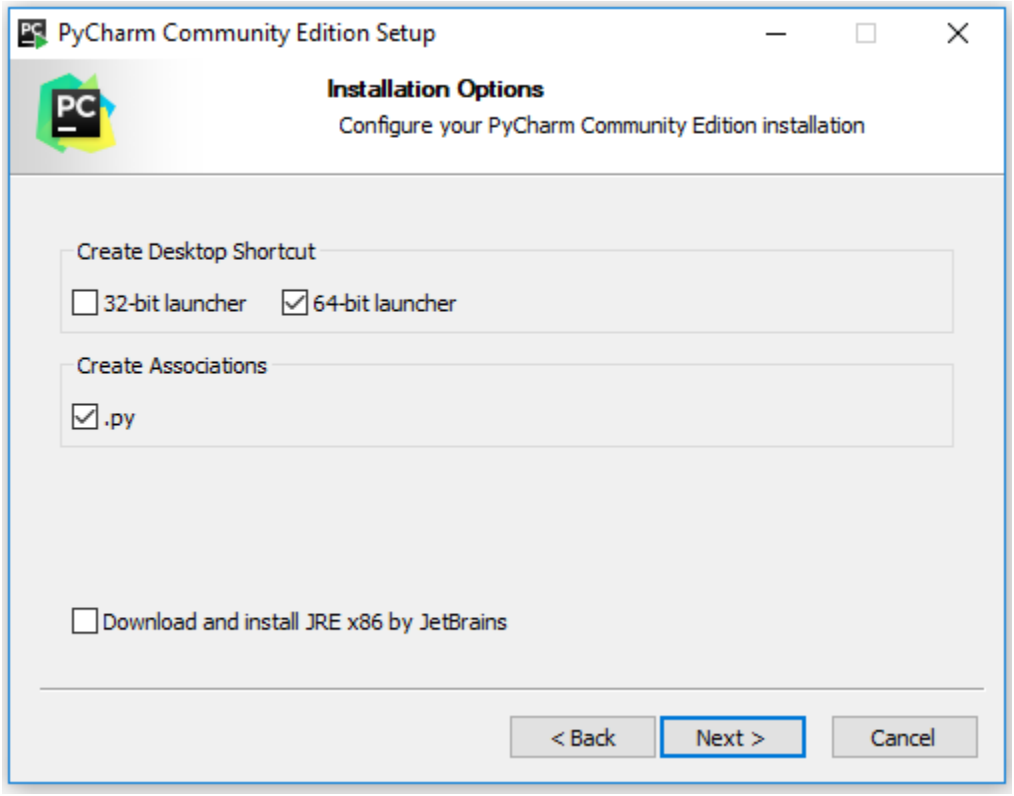
- Click Next to install



Installing PyCharm



Installing PyCharm



Installing PyCharm