

Installation of JupyterLab

MATH 4432 Statistical Machine Learning

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MATH, HKUST

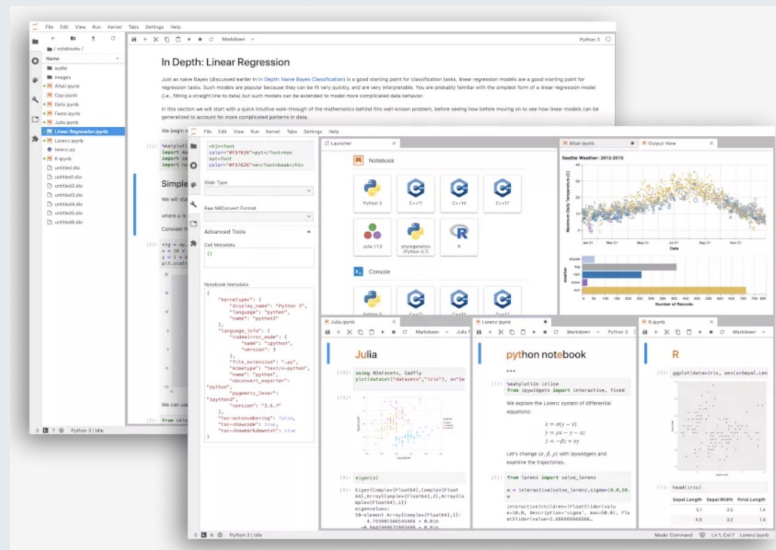
2023-09-12

What is JupyterLab?

JupyterLab: A Next-Generation Notebook Interface

JupyterLab is the latest web-based interactive development environment for notebooks, code, and data. Its flexible interface allows users to configure and arrange workflows in data science, scientific computing, computational journalism, and machine learning. A modular design invites extensions to expand and enrich functionality.

JupyterLab can support **both Python and R**.



Now let's install it via Anaconda!

First download and install Anaconda

Anaconda Installers

Find the version compatible with your device

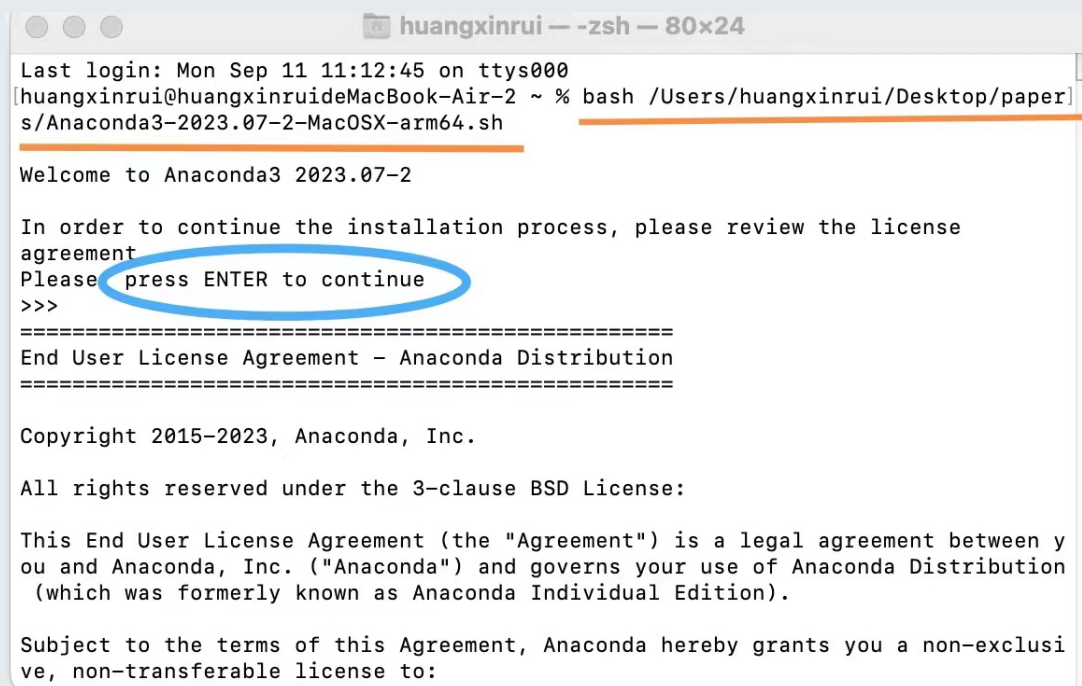
Attention:

Mac users please install the **Command Line Installer** instead of **Graphical Installer**.



For mac users

After installation, open the **terminal** and input "**bash (here fills in the path of the installer just downloaded)**", as shown below.

A terminal window titled 'huangxinrui — -zsh — 80x24'. The prompt is '[huangxinrui@huangxinruiMacBook-Air-2 ~ %]'. The user has entered 'bash /Users/huangxinrui/Desktop/papers/Anaconda3-2023.07-2-MacOSX-arm64.sh'. The terminal output shows the Anaconda3 2023.07-2 welcome message and the start of the End User License Agreement (EULA). The text 'Please press ENTER to continue' is circled in blue. The EULA text includes copyright information for Anaconda, Inc. (2015-2023) and states that the agreement is a legal agreement between the user and Anaconda, Inc. governing the use of Anaconda Distribution (formerly known as Anaconda Individual Edition). The license is described as non-exclusive, non-transferable.

```
huangxinrui — -zsh — 80x24
Last login: Mon Sep 11 11:12:45 on ttys000
[huangxinrui@huangxinruiMacBook-Air-2 ~ %] bash /Users/huangxinrui/Desktop/papers/Anaconda3-2023.07-2-MacOSX-arm64.sh

Welcome to Anaconda3 2023.07-2

In order to continue the installation process, please review the license
agreement
Please press ENTER to continue
>>>
=====
End User License Agreement - Anaconda Distribution
=====

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All rights reserved under the 3-clause BSD License:

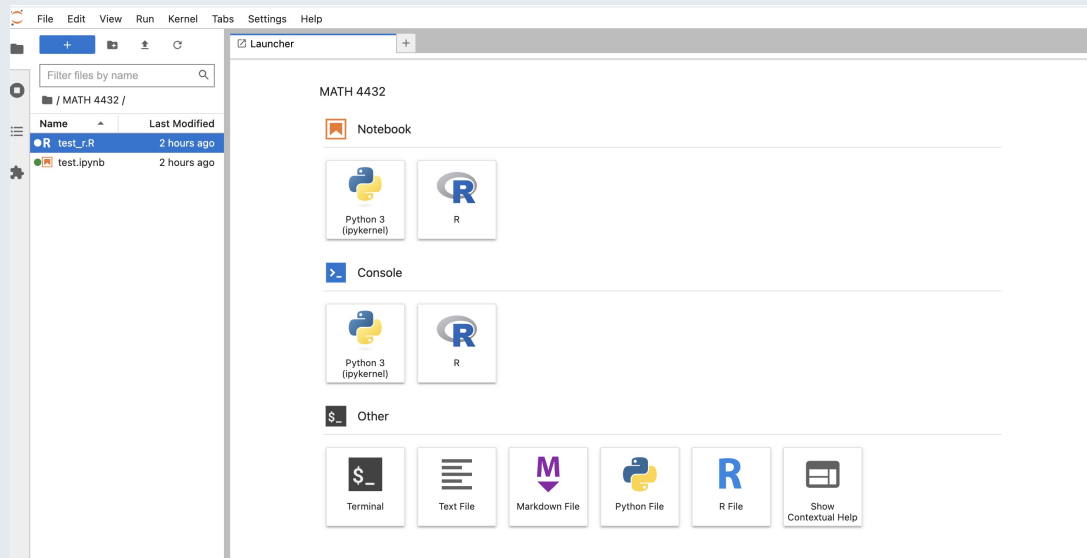
This End User License Agreement (the "Agreement") is a legal agreement between y
ou and Anaconda, Inc. ("Anaconda") and governs your use of Anaconda Distribution
(which was formerly known as Anaconda Individual Edition).

Subject to the terms of this Agreement, Anaconda hereby grants you a non-exclusi
ve, non-transferable license to:
```

Then press **"Enter"**. If you encounter **"y/n"**, then input **"y"**.

For mac users

When you finish the previous process, you can input **"jupyter lab"** in the terminal, and it will direct you to the website of jupyter lab, which is similar to the below picture, **except for the missing R kernel**.



For Windows users

Open the **Anaconda Navigator**, find **JupyterLab** and select **Launch**. Then you'll see the same website.

Next let's add the R kernel!

Add R kernel

For the procedures, you can refer to [Installing the R kernel in Jupyter Lab](#).

The key points are:

- Install the package **"IRkernel"** (in R/Rstudio) by any means;
 - You can use `"devtools::install_github('IRkernel/IRkernel')"` or `"install.packages('IRkernel')"`;
- Run R in **Anaconda Prompt** (for windows users) or **terminal** (for mac users), and carry out **"IRkernel::installspec()"**.

Here we only demonstrate the process for MacOS.



```
huangxinrui — jupyter-lab • R — 80x24
Last login: Mon Sep 11 11:23:40 on ttys000
(base) huangxinrui@huangxinruiMacBook-Air-2 ~ % R

R version 4.2.1 (2022-06-23) -- "Funny-Looking Kid"
Copyright (C) 2022 The R Foundation for Statistical Computing
Platform: x86_64-apple-darwin17.0 (64-bit)

R是自由软件，不帶任何担保。
在某些条件下你可以将其自由散布。
用 'license()' 或 'licence()' 来看散布的详细条件。

R是个合作计划，有许多人人为之做出了贡献。
用 'contributors()' 来看合作者的详细情况
用 'citation()' 会告诉你如何在出版物中正确地引用 R 或 R 程序包。

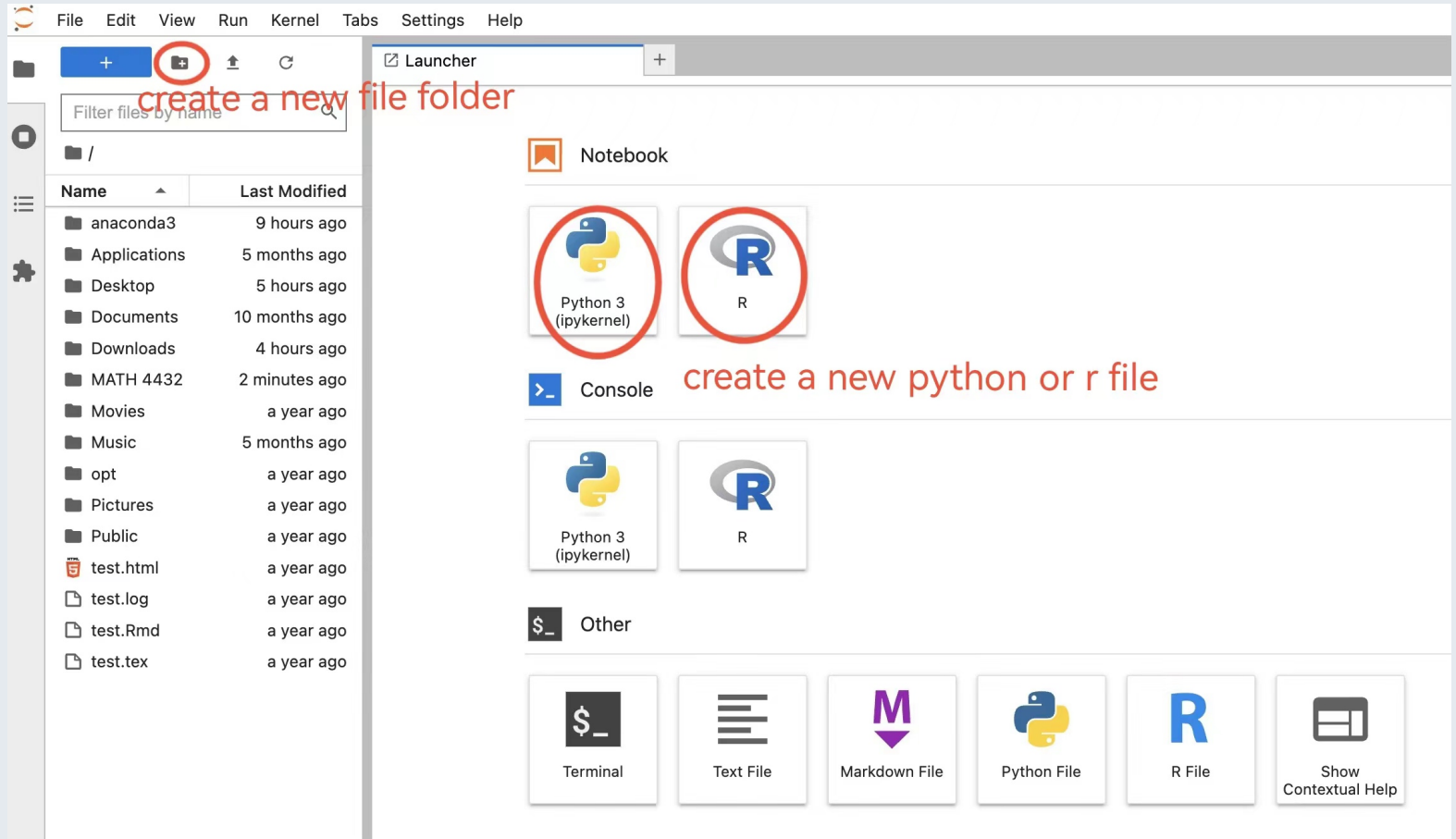
用 'demo()' 来看一些示范程序，用 'help()' 来阅读在线帮助文件，或
用 'help.start()' 通过 HTML 浏览器来看帮助文件。
用 'q()' 退出 R。

【原来保存的工作空间已还原】

> IRkernel::installspec()
```

Use JupyterLab to produce a
homework file

Create a new file or file folder



Produce the corresponding html/pdf file

The screenshot displays the RStudio environment with the following elements:

- File Menu:** Open on the left, with 'Save and Export Notebook As...' highlighted. A sub-menu is open showing options: Asciidoc, **HTML**, LaTeX, Markdown, **PDF**, ReStructured Text, Executable Script, Reveal.js Slides, and Webpdf.
- Code Editor:** Contains R code in a file named 'test.ipynb'. The first cell is selected and has a red box around the run button (a play icon). The code includes:

```
1: print("Hello MATH 4432!")  
[1] "Hello MATH 4432!"  
2: typeof(3L)  
'integer'  
4: set.seed(123)  
# Generate data  
x <- rnorm(100) # 100 samples  
y <- 2 * x - 1 # Linear function  
y_obs <- y + rnorm(100) # Add noise  
# Plot  
plot(x = x, y = y_obs)  
abline(lm(y_obs ~ x))
```
- Output:** Below the code, the output of the first cell is shown, and a scatter plot is displayed for the second cell, showing a positive linear correlation with a regression line.
- Annotations:** Red text and boxes provide instructions: 'run the selected cell' points to the run button; 'determine whether this file uses R or Python' points to the 'R' icon in the top right; 'export the corresponding html, pdf etc.' points to the 'HTML' and 'PDF' options in the export menu.
- Status Bar:** At the bottom, it shows 'Simple' mode, '0' lines, '2' columns, 'R | Idle', 'Mode: Command', 'Ln 1, Col 9', 'test_R.ipynb', and a notification icon.

Error when producing pdf

You may need to follow the guidance and [install Tex](#).

Then reopen JupyterLab and export again.

Installing TeX

For converting notebooks to PDF (with `--to pdf`), nbconvert makes use of LaTeX and the XeTeX as the rendering engine.

! New in version 5.0: We use XeTeX as the rendering engine rather than pdfTeX (as in earlier versions). XeTeX can access fonts through native operating system libraries, it has better support for OpenType formatted fonts and Unicode characters.

To install a complete TeX environment (including XeLaTeX and the necessary supporting packages) by hand can be tricky. Fortunately, there are packages that make this much easier. These packages are specific to different operating systems:

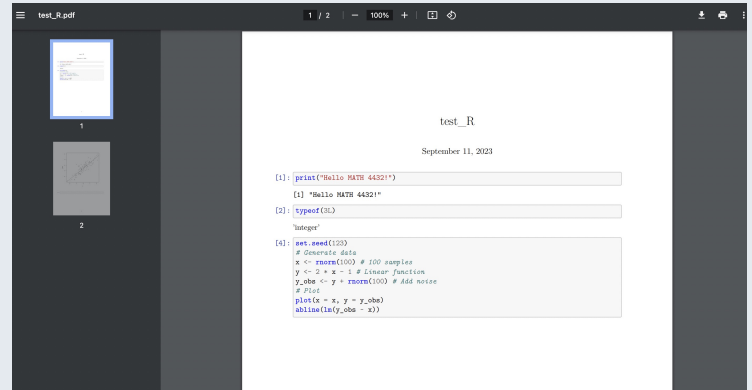
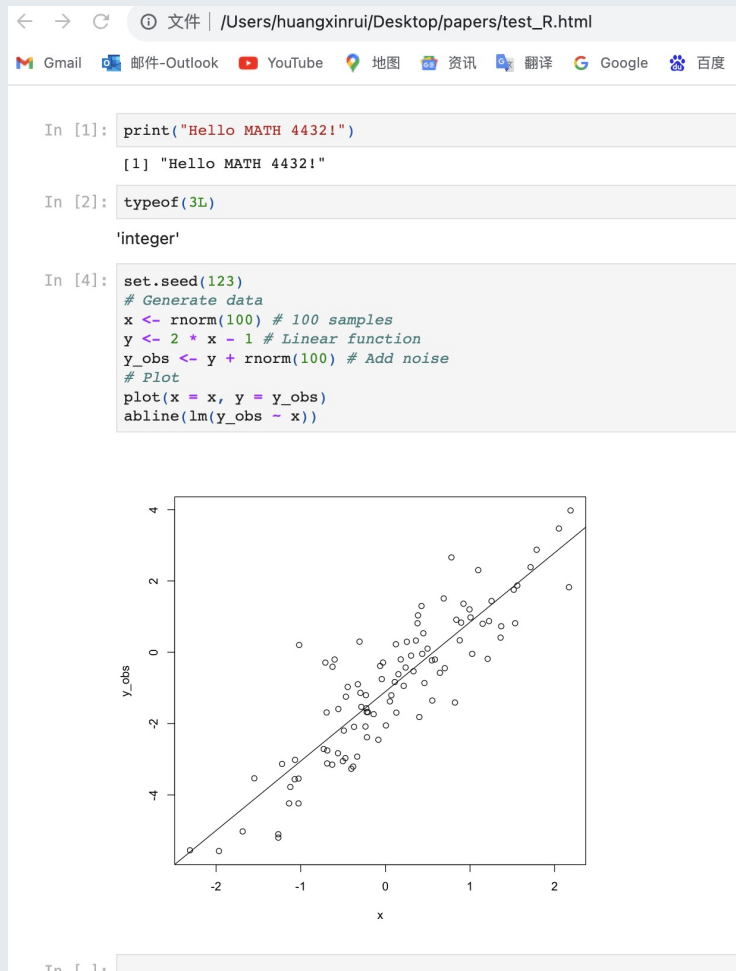
- Linux: [TeX Live](#)
 - E.g. on Debian or Ubuntu:

```
sudo apt-get install texlive-xetex texlive-fonts-recommended texlive-plain-generic
```

- macOS (OS X): [MacTeX](#).
- Windows: [Latex Project](#).

Because nbconvert depends on packages and fonts included in standard TeX distributions, if you do not have a complete installation, you may not be able to use nbconvert's standard tooling to convert notebooks to PDF.

Get the pdf/html successfully!



Thank you!