

Linux Party

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FOCS Group

What is Linux

Linux has just past its 32nd birthday. In many devices, including web servers, smartphones, electric cars, and of course on Steam Decks, you can find Linux.

Linux is an operating system *kernel*. Kernel means "core; central part" in English. Linux on itself can only respond to hardware events; there are no ways to interact with the Linux kernel directly.

People bundle software (browsers, file managers, etc.) together with the Linux kernel to form a functional operating system. Many different people and companies bundle various software with Linux, each coming with their own configurations (wallpapers, theme, etc.) Various "flavors" of the Linux operating system, or *Linux distributions*, are thus created.

Installing Linux

Today, we will help you to install a Linux distribution on your computer. You can choose Ubuntu, one of the most popular Linux distributions; or choose FOCS Debian, a Debian-based distribution which is developed by and for fellow JIers. Also you can choose other distributions.

Notes for macOS users

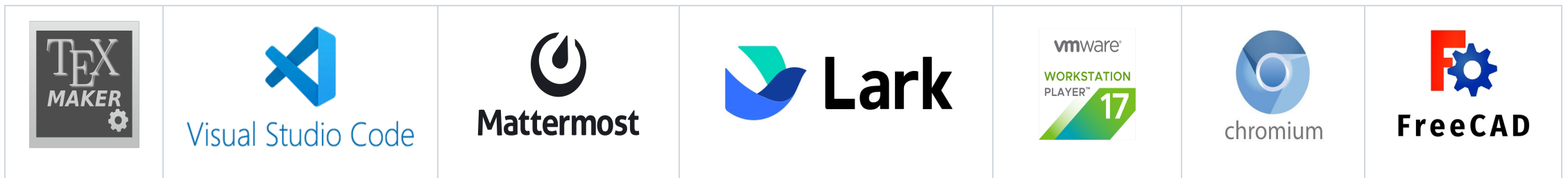
If you purchased your Mac after 2020, it is highly likely that your Mac features an Apple silicon processor. Apple Silicon processors can't run the software required by some JI courses, including Vivado and Solidworks. You are **highly recommended** to prepare a Windows computer as a backup.

Linux and Linux Distributions

Beginner-friendly 新手友好型	Intermediate 中间等级	Hard mode 高难度模式
		
 Ubuntu Based on Debian 基于Debian	 Garuda Linux Based on Arch 基于Arch	 Arch [Independent] – DIY 独立开发-自行搭建
 Pop!_OS Based on Ubuntu 基于Ubuntu	 EndeavourOS Based on Arch 基于Arch	 Gentoo [Independent] – DIY 独立开发-自行搭建
 elementary OS Based on Ubuntu (LTS) 基于Ubuntu(LTS)	 Manjaro Based on Arch 基于Arch	 Slackware [Independent] 独立开发
 Mint Based on Ubuntu 基于Ubuntu	 MX Linux Based on Debian 基于Debian	 Linux From Scratch [Independent] – DIY 独立开发-自行搭建
 Zorin Based on Ubuntu 基于Ubuntu	 Fedora Based on Red Hat 基于红帽	 Qubes OS 基于Fedora-以安全为中心 Based on Fedora – Security
 Solus [Independent] 独立开发	 OpenSUSE [Independent] 独立开发	 NixOS [Independent] – DIY 独立开发-自行搭建

FOCS Debian

- Features a similar interface to Windows 10. Windows users will feel at home
- Developed from base system to avoid redundant software as in official Debian images
- Aims to lower the time spent by students on installing software during labs
- Has the following software pre-installed:



Benefits of having a Linux system

- Survive 151, 280, 281, 482 and other JI courses without having to worry about configuring your system
- More control of your computer; no disturbing desktop ads anymore, no worrying about Big Brother watching you ;)
- A bonus point on your resume that can help you find a job
- Most importantly... Linux is fun!

Ways to get a Linux system

- Use a virtual machine
- Use Windows Subsystem for Linux - WSL
- Install a dual boot system
- Only use Linux on your computer

Comparison of different installation methods

Benefits\Method	WSL	Virtual Machine	Dual Boot
Close integration with your current system (shared files, etc)	Yes	Part	Part
Full-featured Linux	No (sometimes GUI won't work)	Yes	Yes
Easy to install	Yes	Yes	No
Suitable for every-day use	Yes	No	Yes

Comparison of different installation methods

Benefits\Method	WSL	Virtual Machine	Dual Boot
Easy to customize and manage (change desktop wallpaper, tweak system parameters)	No	Yes	Yes
Performance	High	Low	Best
Hardware compatibility	Adequate	Adequate	Good
Our recommendation	Just enough to survive	Recommended for newcomers	Gaining more experience

Some FAQ after installing Linux

- Q: I want to install software under `D:\Program Files` . Where is it?
 - A: Linux have no `C:` or `D:` . Different disks (partitions) are mounted at different path.
- Q: Where are my documents, photos, films... stored?
 - A: You have a dedicated folder for all your personal files. If your username is `focs` then all your files lie under `/home/focs` . This is also the default startup folder of your file manager.
- Q: Where can I find software?
 - A: In most cases you don't need to search online for a long time to get the installer. You have a *package manager* on your system that automatically grabs the software for you. More details later.

Administering a Linux system

Linux is pretty much designed around a command-line *shell* (think of it as a far more powerful version of `cmd`). In order to master Linux, some basic shell knowledge is necessary.

To launch a command-line shell, you may press **Ctrl+Alt+T** on Ubuntu and FOCS Debian; or you may find the application named `Terminal` in the application grid. macOS users may find themselves acquainted with the Terminal app.

Package Manager and installing software

Most distribution have a built-in App Store coming with the installation. Installing software is a one-click there.

However, some command-line only software (like `gcc`) needs to be installed via the *package manager*. Package managers automatically connect to a central software repository, download and install software for you. For Ubuntu and FOCS Debian, the package manager used is apt. Software installation is made easy and straightforward with the presence of package managers.

- To install software, type `sudo apt install software-name` in a Terminal
- To upgrade the system, run `sudo apt update && sudo apt upgrade`
- To remove installed software, run `sudo apt remove software-name`
- To search for something, run `apt search software-name`

Alternatives of common Windows tools

- Microsoft Office -> LibreOffice, WPS Office
- Chinese Input Method -> `ibus` (easier to configure), `fcitx5` (more powerful and more features)
- QQ -> LinuxQQ at <https://im.qq.com/linuxqq>
- MiKTeX, Overleaf TeX Editor -> Texmaker
- Adobe Photoshop, Lightroom, etc. -> GIMP, darktable...
- MATLAB, Mathematica, Vivado has native Linux versions
- Solidworks -> FreeCAD, or check <https://github.com/cryinkfly/SOLIDWORKS-for-Linux>
- Gaming -> Lutris, Steam (supports Windows games)

Where can I find help and support

- Check your distro's Wiki. For example, Ubuntu Wiki is hosted at <https://wiki.ubuntu.com>; Debian at <https://wiki.debian.org>
- Arch Linux Wiki often have the know-how that you want. Check <https://wiki.archlinux.org> if you can't find help on your distro Wiki
- Join FOCS Mattermost! We are available at <https://focs.ji.sjtu.edu.cn/mm> at any time. You are always welcomed!
- You may also join a local Linux User Group. SJTU has its own Linux User Group; check <https://sjtug.org/contacts> for how to join them

Let's begin the Install Party!

Check the documentation of your preferred installation method.