
FOSS - 01

Preface

Q. When will the classes start

Now! ☺

Q. System Requirements

You'd need a laptop with a working keyboard :^)

Q. Is there any limit to how many clubs we can join?

Joining a club starts at the end of 1st year, There's no such limit but we'd suggest focusing on quality than quantity.

If y'all meant to learn from the clubs, you can join as many as you like, and we'd recommend participating in every wing to better know your interest.

Preface

Q. What will FOSS Wing teach? / Why FOSS? / How is FOSS Wing going to be helpful in future?

- We in FOSS Wing will teach you from baseline how a project is created and managed.
- Focusing on how to write in different languages / how to properly write readable code (that is public) / etc.
- FOSS contribution in general showcases your work as its open and free to look at.
- We'll be letting you know how to set up your dev environment, and also will be discussing random quirks about programming for fun in between.

> Sharpening your mind to solve problems: CP
> Making/Maintaining projects, standing out in front of others (showcase meaningful work to the community): FOSS

From Job Perspective: "Projects in Resume" and "Rank in CP platforms" both filter you out of the crowd.
From Personal Perspective: Making/Contributing to projects give you experience.

Before we start

Whoever hasn’t installed Linux on their machine, be sure to be connected to WiFi & run this on your PowerShell:

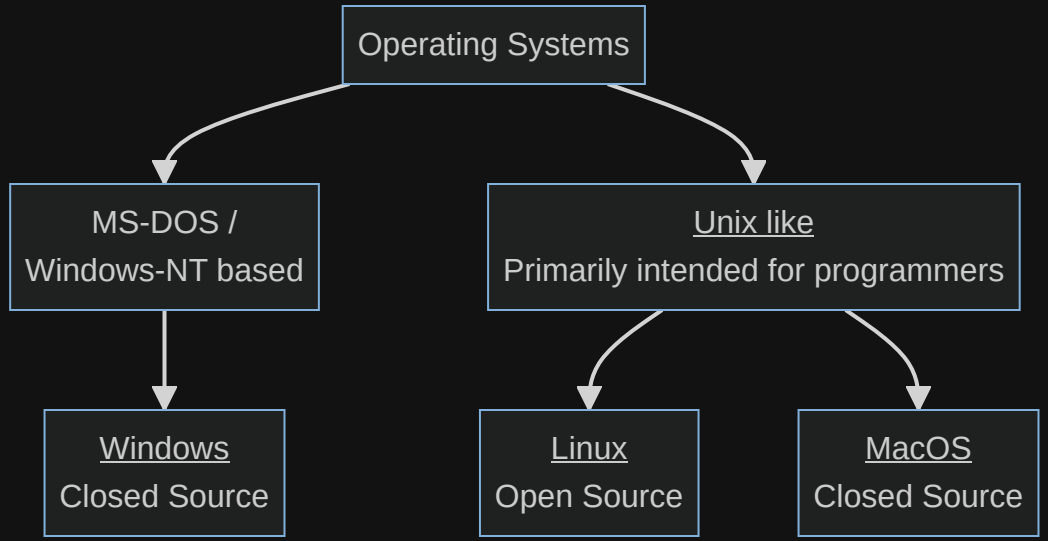
```
wsl --install
```

Let’s start

Outline

- Operating Systems
- What is Linux?
  - Examples
- Ways of using Linux
- Source-Compiler-Binary Analogy
- Hello World on C with
  - VSCode
  - C Compiler (gcc)
- Extend the analogy we discussed earlier

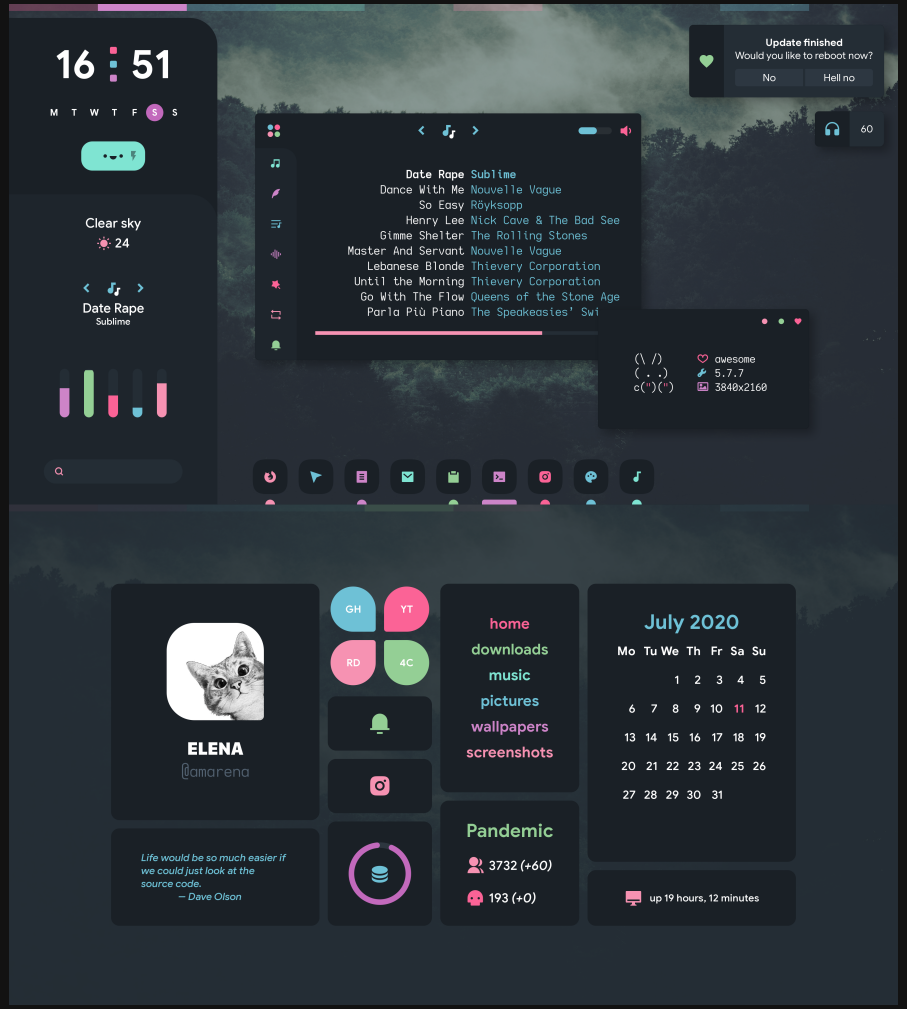
Operating Systems



- **Windows-NT:** Mouse is primary source of interaction
- **Unix:** Keyboard is primary source of interaction

What is Linux?

- Free and Open Source OS based on UNIX.
- Is the one powering 96.3% of the top 1M websites today.
- The only operating-system targeting both the embedded devices (car's music/video system) and the world's most powerful supercomputers.
- Backbone of Android powering over 85% of the daily internet users.
- Assisted to complete over 65 SpaceX missions
- Helped in manifestation of over 90% of special effects used in hollywood movies (including StarWars, LordOfRings, and HarryPotter).


16 51
M T W T F S S
Clear sky
24
Date Rape
Sublime
Update finished
Would you like to reboot now?
No
Hell no
60
Date Rape Sublime
Dance With Me Nouvelle Vague
So Easy Röyksopp
Henry Lee Nick Cave & The Bad See
Gimme Shelter The Rolling Stones
Master And Servant Nouvelle Vague
Lebanese Blonde Thievery Corporation
Until the Morning Thievery Corporation
Go With The Flow Queens of the Stone Age
Parla Più Piano The Speakeasies' Swi
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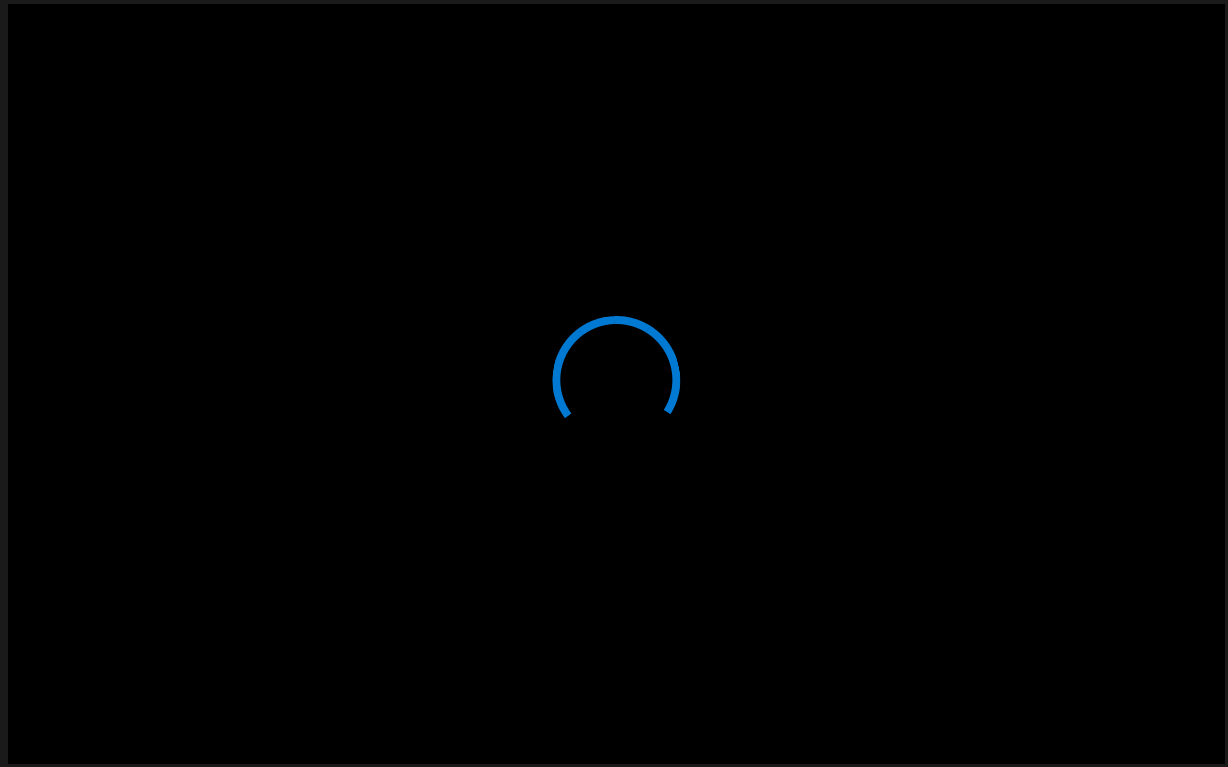
wallpapers
screenshots
July 2020
Mo Tu We Th Fr Sa Su
1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31
Life would be so much easier if we could just look at the source code.
— Dave Olson
Pandemic
3732 (+60)
193 (+0)
up 19 hours, 12 minutes


Hyprland Window Manager | Wayland | Archcraft | ...
Share
YouTube

r/unixporn • Posted by u/Schneegans 8 months ago Workflow

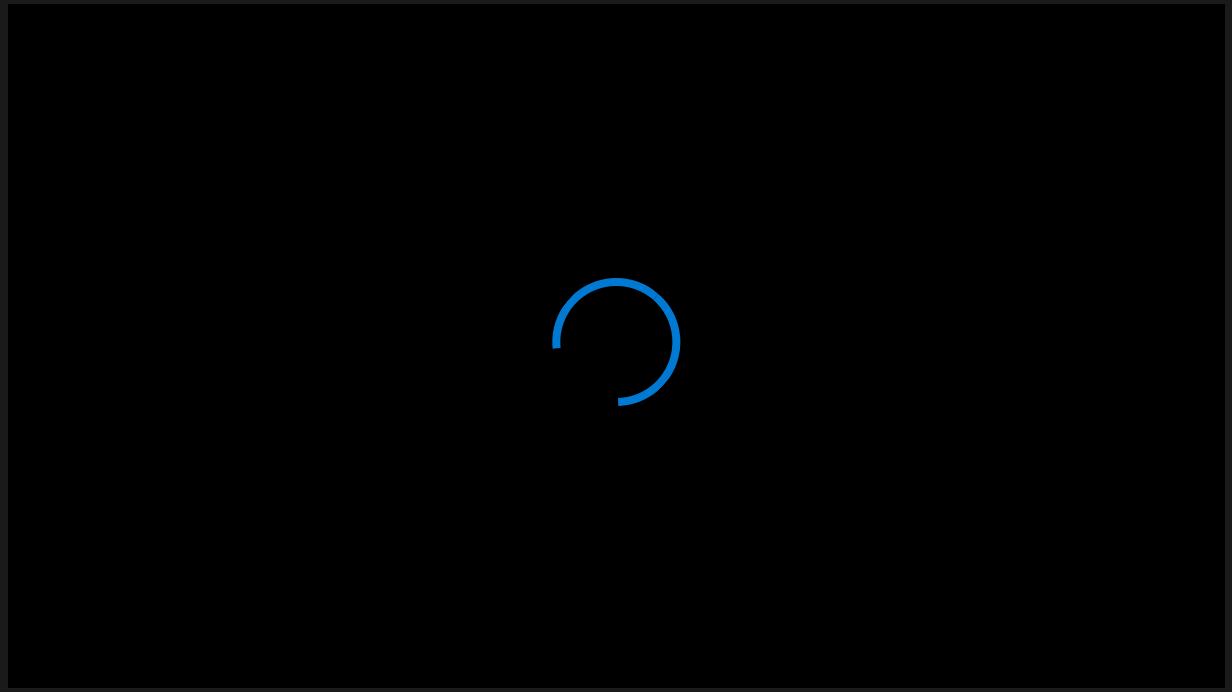
[GNOME] 3D desktop and other fun effects



4655 upvotes · 159 comments

r/unixporn • Posted by u/Rasie1 2 years ago Workflow

[i3] [Razer Blade Stealth] Highlighting shortcuts and workspaces on RGB keyboard



5474 upvotes · 147 comments

Ways of using Linux

1. WSL on Windows
2. Virtual Machine
3. Native Installation (Dual-Booting / Single-Booting)

Ways of using Linux

1. WSL on Windows

Pros:

- In both the options (dual-or-single-boot / virtual-machine) you'll need to tweak laptop through BIOS to run them. WSL2 installs and run swiftly.
- Laptops released just this year may not have good Linux support, as such wifi may not work, which is a big issue.

Cons:

- Since you're still on Windows, you can't customize the desktop however you like as you would in linux.
- Since windows isn't light, you won't get the performance benefits, a native linux can offer (No lags).

Note: WSL is already getting installed in background with `wsl --install` y'all ran earlier.

Ways of using Linux

2. Virtual Machine

Pros:

- Is a way to run Linux with GUI under a window. So you *can* customize the desktop however you like.

Cons:

- But is even worse in performance, as it’s too heavy and mostly laggy even in high-performance CPU.
- Doesn’t integrate with Windows too nicely. As you’ll see later in the slides.

VM Installation resource

Ways of using Linux

3. Native Installation (Dual-Booting / Single-Booting)

Pros:

- You can customize desktop however you like & can setup different functional workflows that can boost your productivity.
- You get customization, performace, security, stability, and everything a linux can offer.
- You can easily debug your setup if it fails later.

Cons:

- Risk of loosing data if not done without care.
- Laptops released just this year may not have good Linux support, as such wifi may not work, which is a big issue.

Ways of using Linux

3. Native Installation (Dual-Booting / Single-Booting)

How to install:

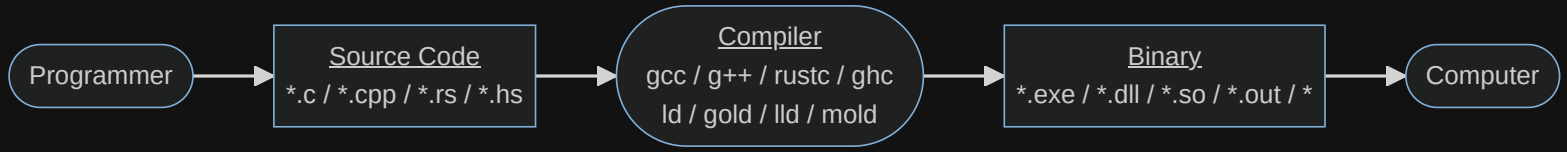
- Get into your BIOS by pressing F2/F10 at the boot time.
- Turn off SecureBoot under Security tab.
- Download Ventoy and flash it on pendrive by following on-screen-instructions.
- Download and copy Linux of your choice into the pendrive.
  - Recommended Distros: LinuxMint / ArcoLinux / choose yourself https://distrochooser.de
- Get into installation by pressing F9/F12 at the boot time.
- Follow on-screen instructions (ensure atleast 60GB is given while installing).

You can ask doubts (in case having trouble installing) here.

Some Basic Terms

- Directory
- Distro
- Desktop Environment (E.g. KDE/GNOME/XFCE/Cinammon/Deepin).
- Terminal & Shell

Source-Compiler-Binary Analogy



Key Takeaways:

- Computers only understands binary (011010100).
- We as a programmer CAN write Binary by hand, but its very cryptic.
- So we write in a high-level construct called as Programming Language (files referred to as Source Code) and use Compilers to make binary out of it.

Computers only understand binary

- As in series of instructions encoded in form of 0s and 1s
- For example .exe are the executable-binary-files in Windows
- Here's how a binary looks (for command `ls`):

```
# Actual contents of binary
xxd -b $(which ls) | less

# Disassembled binary
objdump -d -w -t $(which ls) | less
```

Don't worry about this now (Only for demonstration)

But the problem is, it looks like gibberish trash. So, we don't ***really*** write binary by hand.

Environment Setup (VSCode)

VSCode is a easy-to-use & go to text-editor for writing source code.

- Install the vscode by downloading the installer from their website according to your platform OR in linux (native) use your favourite package manager as instructed in their website
- Install the following extensions:
  - Code Runner
  - C/C++
  - WSL (only windows users)
  - Material Theme (just for fun)

Environment Setup (VSCode)

- Good to know keybinds:
  - Ctrl+Shift+P - Command Pallete, search whatever
  - Ctrl+Shift+` - Launch integrated terminal
  - Ctrl+B - Toggle File Viewer

Note: Windows users use Ctrl+Shift+P and search to "open folder in WSL".

Environment Setup (C Compiler)

C compiler will enable you to turn your C source code into binary which you can run.

Open your terminal (regardless windows/linux/mac user), and install gcc with your favourite package manager:

```
sudo apt update && sudo apt install gcc make    # Ubuntu/Debian (also WSL; by default)
sudo pacman -Syu gcc make                       # ArchLinux & derivatives
sudo xbps-install -S gcc make                   # VoidLinux
sudo dnf install gcc make                       # Fedora/RedHat
```

Note: WSL users follow the Ubuntu/Debian way to install gcc (c-compiler we'll be using).

Hello World on C

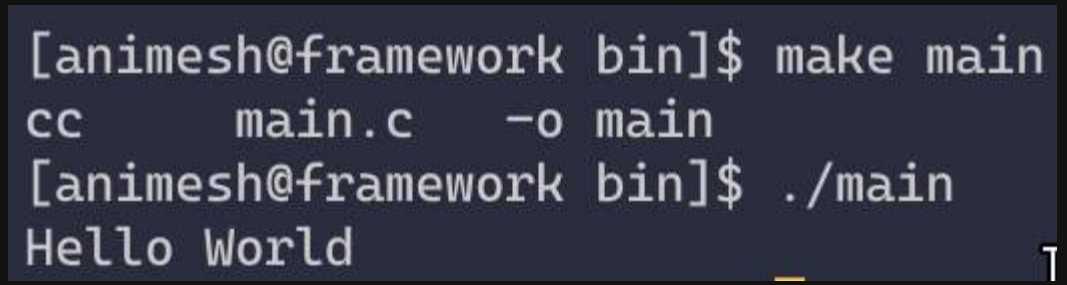
Hello World is the first program anybody writes to start the journey!

- Open any folder in the VSCode, and create a new file ending with `.c` (e.g. `main.c`) and write:

```c
#include <stdio.h>

int main() {
    printf("Hello World\n");
}
```

- To run the code, we have a couple of ways:
  - Use the run button (top right) provided by the CodeRunner extension we've just installed.
  - Open a terminal window (Ctrl+Shift+`) and run `gcc main.c -o main` (or shorthand: `make main`) and `./main` afterwards.

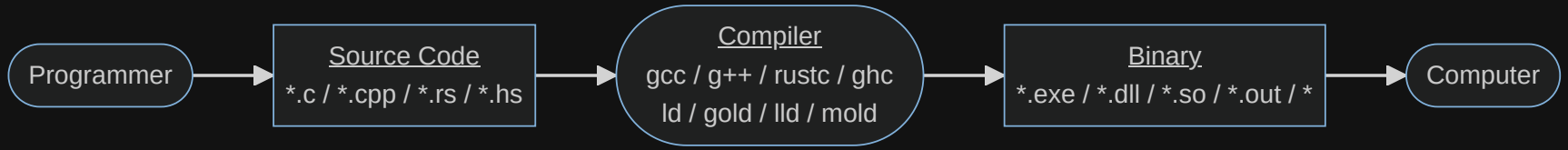


- Viola, You just written and ran your first program!

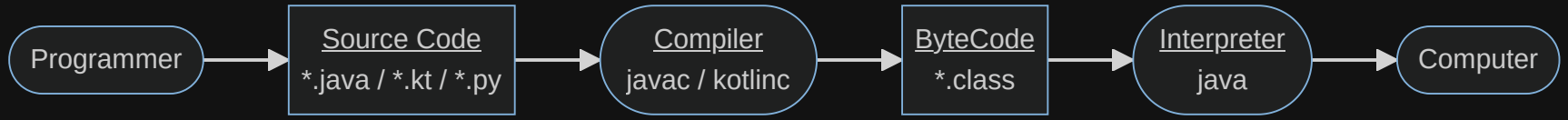
Extend the analogy we discussed earlier

Rightmost square box is distributed. Anything right to rightmost square box needs to be on target computer.

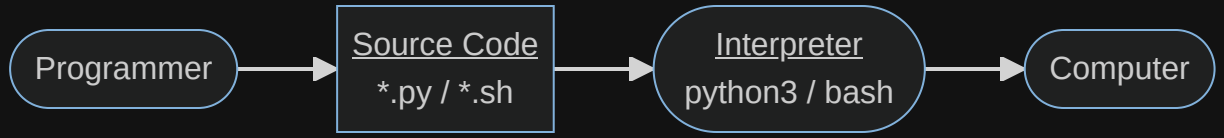
- **Compiled Languages** (Fastest | Most restricted):



- **ByteCode Languages** (Almost Fast | Almost Restricted):



- **Interpreted/Scripting Languages** (Slowest | Most Flexible):



- Interpreter job is also called "Just In Time Compilation" (JIT).
- Compiler job is also called "Ahead Of Time Compilation" (AOT).

Fun Activity (15 min)

- Choose any 2 languages (other than C of course)
- Setup their compiler/interpreter on your system (within WSL/Linux/Mac)
- Write a hello world on them
- Run them and send screenshot on the WhatsApp group!