Unit 1

Linux, Shell & First Tools

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Why Linux & the Terminal?

- Most engineering tools run best on Linux
- The shell = your universal remote for the computer
- Terminal = efficiency, automation, reproducibility
- Professional developers live in the terminal
- Editing, compiling, debugging → all faster

Starting the VM

- Start VirtualBox → load the provided VM
- Log in with given username & password
- Explore:
  - Desktop (graphical view)
  - Terminal (command line interface)

👉 Exercise: Open a terminal window!

First Shell Commands

```
pwd          # where am I? (print working directory)
ls           # list files
cd dir/      # change directory
mkdir lab1   # make new directory
cp a b       # copy file
mv a b       # move/rename
rm file      # remove
man ls       # manual page for ls
```

👉 Exercise:

- Create a folder unit1
- Inside, create a file with echo "hello" > hello.txt

Viewing Files

```
cat file.txt # show whole file
more file.txt # scroll page by page
tail file.txt # show last lines
```

👉 Exercise: Write a log file with

```
dmesg > syslog.txt
```

View first and last lines of syslog.txt.

neovim as your editor

Overview

- Neovim = modern Vim
- Fast, keyboard-driven
- Great for coding in C++

Core keys

- i → insert mode
- Esc → back to normal mode
- :w → save
- :q → quit

👉 Exercise:

- Open hello.txt in neovim
- Add your name to the file
- Save & quit

VSCode

🟩 Overview

- VSCode = full-featured IDE
- Good for browsing, debugging, extensions
- Terminal + Neovim = speed
- VSCode = overview & comfort

👉 Explore:

- File explorer
- Terminal inside VSCode
- Extensions

Working Like Professionals

▌ Why terminal workflow?

- Portable, scriptable, efficient
- Works on servers, embedded boards, remote machines
- Many developers use `tmux` + `vim` + `git` as daily tools

Hands-On Challenge

1. Create project1/ directory
2. Inside:

```
echo "int main(){return 0;}" > main.cpp
```

3. Open with neovim and change 0 → 42
4. Download a file (we'll provide in class):

```
wget https://raw.githubusercontent.com/.../sensor.cpp
```

5. Find line with word "temperature":

```
grep "temperature" sensor.cpp
```

Questions?