🐧 Ubuntu Terminal Tutorial: Getting Started with the Command Line

Welcome! This short tutorial introduces you to essential Ubuntu terminal skills. By the end, you'll be able to navigate the system, install useful tools, and monitor CPU performance using `htop`.

📓 Section 1: Basic Terminal Navigation

The terminal is the primary way to interact with Ubuntu beyond the graphical interface. Here are some basic commands to get you started:

◈ Common Commands

```bash
pwd             # Print current working directory
ls -al          # List all files (including hidden) with details
cd ~            # Go to your home directory
mkdir mydir     # Create a new directory
touch file.txt  # Create an empty file
rm file.txt     # Remove a file
```

These commands form the foundation of daily terminal work.

🖥 Section 2: Monitor Your System — Installing and Using htop

System running slow? Curious about what's consuming your CPU or memory? Let's explore htop, a colorful, interactive process viewer.

☑ Installing htop

To install htop,

THIS IS IMPORTANT! THIS IS IMPORTANT! You have to first open 10 terminals from your local OS, As this is required for downloading htop. After that, you can use the following commands to install htop:

```bash
sudo apt install -y htop
```

Once launched, You'll see a live view of:
- CPU usage per core
- RAM and swap usage
- All running processes

🧪 Mini Exercise

```bash
htop            # Launch htop
# Use arrow keys to navigate
# Press F9 to kill a selected process
```

📦 Section 3: Install Some Cool Everyday Tools

Here are a few extra lightweight tools that aren't installed by default but are very handy and fast to install.

🔖 Recommended Tools

Tool	Install Command	Description
tree	`sudo apt install tree`	Visualize directory structures as trees
neofetch	`sudo apt install neofetch`	Show system info with OS logo
tldr	`sudo apt install tldr`	Simple, community-driven man pages

🧪 Try It Out

```bash
tree ~          # Show your home directory structure
neofetch          # Display system information
tldr zip        # Learn how to use the `zip` command
```

📄 Section 4: File Manipulation and Text Editing

Learning to manipulate files and edit text efficiently is essential for any Linux user.

◈ File Operations

```bash
cp file.txt backup.txt        # Copy a file
mv file.txt newname.txt       # Rename a file
mv file.txt ~/Documents/      # Move a file to a directory
cat file.txt                  # Display file contents
less file.txt                 # View file with pagination
grep "search term" file.txt   # Search for text in a file
```

◈ Text Editors

Ubuntu comes with several text editors. Here are two popular ones:

Editor	Command	Description
nano	`nano file.txt`	Simple, beginner-friendly editor
vim	`vim file.txt`	Powerful, keyboard-driven editor

🧪 Mini Exercise

```bash
# Create a file and edit it with nano
touch myfile.txt
nano myfile.txt
# Type some text, save with Ctrl+O, exit with Ctrl+X

# Search for a word in your file
grep "Ubuntu" myfile.txt
```

🔒 Section 5: User Permissions and Sudo

Understanding permissions is crucial for security and proper system management.

◈ Permission Basics

```bash
ls -l                    # List files with permissions
chmod +x script.sh       # Make a file executable
chmod 755 script.sh      # Set specific permissions
chown user:group file.txt     # Change file ownership
```

◈ Understanding Permission Numbers

Number	Permission	Description
4	Read	Allow reading the file
2	Write	Allow modifying the file
1	Execute	Allow executing the file

Combine these numbers for different permissions (e.g., 7 = 4+2+1 = read+write+execute).

◈ Using Sudo

```bash
sudo command          # Run command with admin privileges
sudo -i               # Switch to root user
sudo apt update       # Example: update package lists
```

🔬 Mini Exercise

```bash
# Create a script
echo '#!/bin/bash' > myscript.sh
echo 'echo "Hello from my script"' >> myscript.sh

# Make it executable
chmod +x myscript.sh

# Run it
./myscript.sh
```

🌐 Section 6: Networking Tools

These commands help you diagnose network issues and understand your connectivity.

◈ Common Network Commands

```bash
ip a                # Show network interfaces
ping google.com       # Test connectivity to a website
nslookup google.com    # Look up DNS information
netstat -tuln        # Show active network connections
```

◈ Installing Network Tools

```bash
# Install network utilities
sudo apt install net-tools     # For netstat, ifconfig, etc.
sudo apt install dnsutils      # For dig, nslookup, etc.
sudo apt install traceroute    # For traceroute
```

◈ Network Monitoring

```bash
# Monitor network traffic in real-time
sudo apt install iftop
sudo iftop           # Run iftop (requires sudo)

# Simpler alternative
sudo apt install nethogs
sudo nethogs         # Monitor per-process network usage
```

🧪 Mini Exercise

```bash
# Check your IP address
ip a | grep inet

# Test connectivity and measure response time
ping -c 5 google.com

# Trace the route to a website
traceroute google.com
```

```