Linux Basics for Machine Learning Engineers

File and Directory Management

```
ls                # List files in the current directory
ls -lh            # Long format with human-readable file sizes
cd <dir>          # Change directory
pwd               # Print working directory
mkdir <dir>       # Create a new directory
rm <file>         # Remove a file
rm -r <dir>       # Recursively remove a directory
cp <src> <dest>   # Copy file or directory
mv <src> <dest>   # Move or rename file/directory
```

Viewing and Editing Files

```
cat <file>        # Print file content
head <file>       # Show the first 10 lines
tail <file>       # Show the last 10 lines
less <file>       # Scroll through a file (q to quit)
nano <file>       # Open file in nano editor
vim <file>        # Open file in vim editor (advanced)
```

Searching and Filtering

```
grep "pattern" <file>          # Search for pattern in file
find . -name "*.py"            # Find Python files recursively
wc -l <file>                   # Count lines in file
du -sh *                       # Show disk usage of files/directories
```

Python & Virtual Environment Tools

```
python --version               # Check Python version
```

```
pip install <package>          # Install Python package
pip list                       # List installed packages
python -m venv venv            # Create virtual environment
source venv/bin/activate       # Activate virtual environment
deactivate                     # Deactivate virtual environment
```

ML-Specific and Notebook Tools

```
jupyter notebook               # Start a Jupyter Notebook server
jupyter lab                    # Start Jupyter Lab (if installed)
nvidia-smi                     # Check GPU status (for NVIDIA GPUs)
top / htop                     # Monitor system resource usage
```

Process and Job Management

```
ps aux | grep python           # Check running Python processes
kill <pid>                     # Kill a specific process by PID
nohup python script.py &       # Run script in background (even after logout)
```

Networking & Git Basics

```
ping google.com                # Check internet connection
curl http://example.com        # Fetch a webpage
git clone <repo-url>           # Clone a Git repository
git pull                       # Pull latest changes
```