Linux Command Line Cheat Sheet

This cheat sheet provides commonly used Linux commands for students working in a terminal environment. It is a quick reference for navigation, file manipulation, permissions, processes, and compilation.

1. Navigation

```
pwd           # Print working directory
ls            # List files
ls -l         # Detailed list
ls -a         # Show hidden files
cd <dir>      # Change directory
cd ..         # Move up one directory
cd ~          # Go to home directory
```

2. File and Directory Operations

```
touch <file>      # Create empty file
mkdir <dir>       # Create directory
rm <file>         # Remove file
rm -r <dir>       # Remove directory and contents
cp <src> <dest>   # Copy file
mv <src> <dest>   # Move or rename file
cat <file>        # Display file contents
less <file>       # View file with scroll
```

3. Permissions

```
ls -l           # Show permissions
chmod 755 <file>   # Change permissions (rwxr-xr-x)
chown user:group <file>  # Change ownership
```

4. Searching and Finding

```
grep 'text' <file>     # Search text in file
grep -r 'text' <dir>   # Recursive search
find . -name <file>    # Find file by name
```

5. Processes

```
ps              # List processes
ps aux | grep <name> # Search for process
top             # Interactive process viewer
```

```
kill <pid>        # Kill process by PID
kill -9 <pid>      # Force kill process
```

6. Compilation and Execution

```
gcc prog.c -o prog    # Compile C program
g++ prog.cpp -o prog  # Compile C++ program
./prog            # Run executable
```

7. Networking

```
ping <host>      # Test connectivity
ifconfig        # Show network interfaces (older)
ip addr         # Show IP addresses
curl <url>       # Fetch URL content
```

8. File Compression

```
tar -cvf file.tar dir/   # Create tar archive
tar -xvf file.tar       # Extract tar archive
gzip file           # Compress file
gunzip file.gz        # Decompress file
```

9. Useful Shortcuts

```
Ctrl+C   # Stop current process
Ctrl+Z   # Suspend process
fg      # Resume foreground job
bg      # Resume background job
history  # Show command history
!!      # Repeat last command
!n      # Repeat command number n from history
```

Summary

Linux commands are powerful tools for managing files, processes, and systems. Mastery comes with practice; start with navigation and file operations, then explore permissions and processes.