

Unified Shell Command Reference Guide

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File & Directory Operations

Creating Files

Operation	Windows (CMD)	Windows (PowerShell)	Unix/Linux/macOS
Create empty file	<code>echo. > filename.txt</code>	<code>New-Item filename.txt -ni</code>	<code>touch filename.txt</code>

PowerShell Alias: `ni` is shorthand for `New-Item`

Usage Examples:

```
# PowerShell
New-Item myfile.txt -ItemType File
ni myfile.txt

# Unix/Linux/macOS
touch myfile.txt
```

Creating Directories

Operation	Windows (CMD/PowerShell)	Unix/Linux/macOS
Create directory	mkdir directory_name	mkdir directory_name

Usage Examples:

```
# Works on all platforms
mkdir mydirectory

# Creates a directory in the current working directory
```

Copying Files & Directories

Operation	Windows (CMD)	Windows (PowerShell)	Unix/Linux/macOS
Copy file	copy source.txt dest.txt	Copy-Item source.txt cp source.txt dest.txt	cp source.txt dest.txt
Copy directory	xcopy src_dir dest_dir /	Copy-Item -Recurse cp - Recurse src_dir dest_dir	cp -r src_dir dest_dir

PowerShell Alias: `cp` is shorthand for `Copy-Item`

Usage Examples:

```

# PowerShell
Copy-Item file.txt ../target_folder
cp file.txt file_copy.txt

# Unix/Linux/macOS
cp original_file.txt copied_file.txt
cp original_file.txt ../target_folder

```

Moving & Renaming

Operation	Windows (CMD)	Windows (PowerShell)	Unix/Linux/macOS
Move file	move source.txt dest.txt	Move-Item source.txt mv source.txt dest.txt	mv source.txt dest.txt
Move directory	move src_dir dest_dir	Move-Item src_dir mv src_dir dest_dir	mv src_dir dest_dir
Rename file/directory	Same as move operation		

PowerShell Alias: `mv` is shorthand for `Move-Item`

Usage Examples:

```

# Rename a file (all platforms)
mv file_X.txt file_Y.txt

# Move a file to parent directory
mv file.txt ..

# Move to target directory
mv file.txt ../target_folder

```

Deleting Files & Directories

Operation	Windows (CMD)	Windows (PowerShell)	Unix/Linux/macOS
Delete file	<code>del filename.txt</code>	<code>Remove-Item filename.txt</code>	<code>rm filename.txt</code>
Delete directory (recursive)	<code>rmdir /S /Q dir_name</code>	<code>Remove-Item -Recurse dir_name</code>	<code>rm -r dir_name</code>
Delete directory (forced)	N/A	<code>Remove-Item -Recurse -rf dir_name</code>	<code>rm -rf dir_name</code>

⚠ Warning: The `-rf` (recursive + force) flags will delete files/directories immediately without confirmation. Use with extreme caution!

PowerShell Alias: `rm` is shorthand for `Remove-Item`

Usage Examples:

```
# Delete a file
rm filename.txt

# Delete a directory and all contents (with confirmation)
rm -r directory_name

# Delete a directory forcefully (no confirmation - DANGEROUS!)
rm -rf directory_name
```

Navigation & Information

Listing Directory Contents

Operation	Windows (CMD)	Windows (PowerShell)	Unix/Linux/macOS
List files	<code>dir</code>	<code>Get-ChildItem</code> or <code>ls</code>	<code>ls</code>
List with details	<code>dir</code>	<code>ls -l</code>	<code>ls -l</code>
List all (including hidden)	<code>dir /A</code>	<code>Get-ChildItem -Force</code> or <code>ls -a</code>	<code>ls -a</code>
List all with details	<code>dir /A</code>	<code>Get-ChildItem -Force</code> or <code>ls -al</code>	<code>ls -al</code>

PowerShell Alias: `ls` is shorthand for `Get-ChildItem`

Usage Examples:

```
# List all files in current directory
ls

# List all files including hidden config files (starting with .)
ls -a

# List all files in long format (permissions, owner, size, date)
ls -l

# Combination: all files + long format
ls -al
```

Changing Directory

Operation	Windows (CMD/PowerShell)	Unix/Linux/macOS
Change directory	<code>cd directory_name</code>	<code>cd directory_name</code>
Go to parent directory	<code>cd ..</code>	<code>cd ..</code>
Go to home directory	<code>cd %USERPROFILE%</code> (CMD) or <code>cd ~</code> (PowerShell)	<code>cd ~</code> or <code>cd</code>

Usage Examples:

```
# Navigate to a directory
cd mydirectory

# Go back to parent directory
cd ..

# Go to home directory
cd ~
```

Current Directory Path

Operation	Windows (CMD)	Windows (PowerShell)	Unix/Linux/macOS
Print working directory	<code>echo %cd%</code>	<code>Get-Location</code> or <code>pwd</code>	<code>pwd</code>

PowerShell Alias: `pwd` is shorthand for `Get-Location`

File Content Operations

Viewing File Contents

Operation	Windows (PowerShell)	Unix/Linux/macOS
Display file content	<code>gc filename.txt</code>	<code>cat filename.txt</code>

PowerShell Alias: `gc` is shorthand for `Get-Content`

Searching Within Files

Operation	Windows (PowerShell)	Unix/Linux/macOS
Search for text in file	<code>Select-String "term" file.txt</code>	<code>grep "term" file.txt</code>
Search (case insensitive)	<code>Select-String "term" file.txt</code> (default)	<code>grep -i "term" file.txt</code>
Search with line numbers	<code>Select-String "term" file.txt</code>	<code>grep -n "term" file.txt</code>
Count occurrences	N/A (use measure)	<code>grep -c "term" file.txt</code>

Usage Examples:

```
# Unix/Linux/macOS
# Search for "error" in log file (case insensitive)
grep -i "error" logfile.txt

# Search and show line numbers
grep -n "TODO" code.py

# Count occurrences
grep -c "warning" logfile.txt
```

Opening Files

Operation	Windows (CMD/PowerShell)	Unix/Linux	macOS
Open with default app	<code>start filename.txt</code>	<code>xdg-open filename.txt</code>	<code>open filename.txt</code>

PowerShell Alternative: `Start-Process filename.txt`

System Commands

Operation	Windows (CMD/PowerShell)	Unix/Linux/macOS
Display text	<code>echo "text"</code>	<code>echo "text"</code>
Clear screen	<code>cls</code> (CMD/PowerShell) or <code>clear</code> (PowerShell)	<code>clear</code>

Usage Examples:

```
# Print text to terminal
echo "Hello, World!"
echo "#stuff" # Outputs: #stuff

# Clear the terminal screen
clear # or cls on Windows
```

Help & Documentation

Operation	Windows (PowerShell)	Unix/Linux/macOS
Get command help	<code>Get-Help command_name</code>	<code>man command_name</code>

Note: Press `Q` to exit the manual/help viewer.

Exit Terminal

Operation	All Platforms
Exit/close terminal	<code>exit</code>

Advanced Search Operations

Complex Find & Grep Operations

Unix/Linux/macOS Example:

```
# Find all .cpp files and search for "cansmiles" in them
find . -name "*.cpp" -print -exec grep -i cansmiles {} \;
```

Command Breakdown:

- `.` : Start from current directory
- `-name "*.cpp"` : Filter files by name pattern (all .cpp files)
- `-print` : Display the search results
- `-exec` : Execute the following command on each result
- `grep -i cansmiles` : Search for "cansmiles" (case insensitive)
- `{}` : Placeholder for the filename found by find
- `\;` : Terminates the -exec command

More Examples:

```
# Find all C/C++ files and search for specific text
find . -name "*.{c,cpp}" -print -exec grep cansmiles {} \;

# Find files and search with line numbers
find . -name "*.py" -exec grep -n "TODO" {} \;

# Find files modified in the last 7 days
find . -name "*.txt" -mtime -7
```

Git Basics

Initial Repository Setup

```
# Initialize a new Git repository
git init

# Add files to staging area
git add filename.txt
git add README.md

# Commit changes with a message
git commit -m "first commit"

# Add remote repository
git remote add origin https://github.com/username/projectname.git

# Push to remote repository
git push -u origin master
```

Basic Git Commands

Command	Description
<code>git init</code>	Initialize current directory as a Git repository
<code>git add filename</code>	Stage a file for commit
<code>git commit -m "message"</code>	Create a commit (snapshot) with a descriptive message
<code>git status</code>	Show current status of Git repository
<code>git log</code>	View commit history (SHA, author, date, message)

Important Concepts:

- **SHA:** Unique identifier for each commit (alphanumeric string)
- **Commit Message:** Should be clear and precise to describe what changes were made
- Press `Q` to exit `git log`

```
# View a specific commit (read-only)
git checkout 45581cebdd2cae494f80f44010af9e4a86c9b8fa

# Return to latest version
git checkout master

# Reset to a specific commit (DESTRUCTIVE - permanent change)
git reset --hard 45581cebdd2cae494f80f44010af9e4a86c9b8fa

# Reset to last commit (DESTRUCTIVE - erases all changes)
git reset --hard

# Create a new branch and switch to it
git checkout -b new_branch
```

⚠️ Warning: `git reset --hard` permanently deletes changes. Use with caution!

Shell Configuration Files

Understanding Shell Configuration

Different shells load different configuration files depending on the context (login shell vs. interactive shell).

File	Purpose	Shell	OS	Loading Behavior
<code>~/.zshrc</code>	Zsh customization	Zsh	All	Loaded by each Zsh shell instance
<code>~/.bash_profile</code>	Bash login shell	Bash	macOS	Loaded by the first login shell
<code>~/.bashrc</code>	Bash interactive	Bash	All	Loaded by interactive non-login shells
<code>~/.profile</code>	Generic settings	Various shells	All	Loaded by login shells

Note: Files starting with `.` (dot) are hidden configuration files. Use `ls -a` to view.

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Documentation Resources

Zsh:

- Official Manual: http://zsh.sourceforge.net/Doc/Release/zsh_toc.html

Bash:

- Bash Reference Manual: <https://www.gnu.org/software/bash/manual/>
- Bash Startup Files: https://www.gnu.org/software/bash/manual/html_node/Bash-Startup-Files.html

General Shell Resources:

- Linux Documentation Project: <https://tldp.org/>

Keyboard Shortcuts

Universal Shortcuts (Windows/macOS/Linux)

Basic Editing

Shortcut	Action
Ctrl + C	Copy
Ctrl + V	Paste
Ctrl + X	Cut
Ctrl + Z	Undo
Ctrl + Y	Redo/Repeat
Ctrl + A	Select All
Ctrl + F	Find/Search
Ctrl + P	Print

macOS Note: Replace `Ctrl` with `Cmd` (⌘) for most shortcuts.

Terminal-Specific Shortcuts

Universal Terminal Shortcuts:

Shortcut	Action
Ctrl + C	Cancel/Interrupt current command
Ctrl + D	Exit terminal (logout)
Ctrl + L	Clear screen (alternative to clear command)
Ctrl + A	Move cursor to beginning of line
Ctrl + E	Move cursor to end of line
Ctrl + U	Clear line before cursor
Ctrl + K	Clear line after cursor
Ctrl + W	Delete word before cursor
Ctrl + R	Search command history (reverse search)

Windows-Specific:

Shortcut	Action
Ctrl + Esc	Return to start screen

Excel Shortcuts (Reference)

Function Keys

Shortcut	Action
F1	Help
F2	Edit mode
F3	Paste name
F4	Repeat last action / Toggle absolute/relative references
F5	Go to
F6	Next panel
F7	Spell check
F8	Extend mode
F9	Recalculate all workbooks
F10	Activate menu bar
F11	New chart
F12	Save As

Time & Date

--	--

Shortcut	Action
Ctrl + :	Insert current time
Ctrl + ;	Insert current date
Ctrl + "	Copy value from cell above
Ctrl + '	Copy formula from cell above

Formatting

Shortcut	Action
Ctrl + Shift + ~	General format
Ctrl + Shift + !	Comma format
Ctrl + Shift + @	Time format
Ctrl + Shift + #	Date format
Ctrl + Shift + \$	Currency format
Ctrl + Shift + %	Percentage format
Ctrl + Shift + ^	Exponential format
Ctrl + Shift + &	Place border around selected cells

Shift + Function Keys

Shortcut	Action

Shortcut	Action
Shift + F1	What's This?
Shift + F2	Edit cell comment
Shift + F3	Paste function into formula
Shift + F4	Find next
Shift + F5	Find
Shift + F6	Previous panel
Shift + F8	Add to selection
Shift + F9	Calculate active worksheet
Shift + F10	Display context menu
Shift + F11	New worksheet
Shift + F12	Save

Ctrl + Function Keys

Shortcut	Action
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Shortcut	Action
Ctrl + F1	Open file
Ctrl + F3	Define name
Ctrl + F4	Close
Ctrl + F5	Restore window size
Ctrl + F6	Next workbook window
Ctrl + F7	Move window
Ctrl + F8	Resize window
Ctrl + F9	Minimize workbook
Ctrl + F10	Maximize or restore window
Ctrl + F11	Insert macro sheet 4.0
Ctrl + F12	Open

Alt + Function Keys

Shortcut	Action
Alt + F1	Insert chart
Alt + F2	Save As
Alt + F4	Exit
Alt + F8	Macro dialog
Alt + F11	Visual Basic Editor
Alt + 64	@ symbol
Alt + =	AutoSum

Additional Excel Shortcuts

Shortcut	Action
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Shortcut	Action
Ctrl + `	Toggle value/formula display
Ctrl + Shift + A	Insert argument names in formula
Alt + Down Arrow	Display AutoComplete list
Alt + '	Style format dialog
Ctrl + End	Move to end of used range
Ctrl + W	Close workbook
Ctrl + N	New workbook / Bold (context-dependent)
Ctrl + K	Insert hyperlink / Italic
Ctrl + U	Underline
Ctrl + D	Fill down
Ctrl + B	Bold / Find (context-dependent)
Ctrl + L	Create table / Replace

PowerShell Aliases Quick Reference

Common Unix-like aliases available in PowerShell:

Alias	Full Command	Description
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Alias	Full Command	Description
ls	Get-ChildItem	List files
pwd	Get-Location	Print working directory
cd	Set-Location	Change directory
rm	Remove-Item	Remove/delete
mv	Move-Item	Move/rename
cp	Copy-Item	Copy
cat	Get-Content	Display file content
gc	Get-Content	Display file content
ni	New-Item	Create new item
clear	Clear-Host	Clear screen

Best Practices

- 1. Command Syntax:** `command -option [argument]`
- 2. Write Clear Commit Messages:** Future you will thank present you
- 3.** `git reset --hard`
- 4.** `Get-Help command`
- 5. Practice Safety:** Always double-check paths before deleting files or directories
- 6. Learn Your Shell:** Understanding your shell's configuration files can greatly improve your workflow
- 7. Use Version Control:** Git is essential for tracking changes and collaborating with others

Additional Resources

Educational Content

- **How Computers Work:** <https://www.youtube.com/watch?v=QZwneRb-zqA>

This guide consolidates commands across Windows (CMD/PowerShell), Unix, Linux, and macOS platforms.

Always verify command syntax for your specific operating system and shell version.