Ultimate TMUX & Terminal Productivity Cheatsheet

🚀 Session Management

Command	Action	Best Practice
`t <name>`	Create/Attach Session	Primary entry point - `t my-project`
`Ctrl+a j`	Pop-up Session Switcher	**Most used** - fuzzy search all projects
`Ctrl+a d`	Detach Session	End of day - keeps everything running
`tmux attach`	Re-attach Session	Next day - restore entire workspace
`Ctrl+a r`	Reload Config	After editing `~/.tmux.conf`

🪟 Windows (Virtual Tabs)

Shortcut	Action	Usage
`Ctrl+a c`	New Window	Separate major tasks
`Ctrl+a ,`	Rename Window	Do immediately - name it meaningfully
`Ctrl+a n/p`	Next/Previous Window	Primary navigation
`Ctrl+a &`	Close Window	Clean up finished tasks
`Ctrl+a 1-9`	Jump to Window	Direct access

📱 Panes (Split Screens)

Shortcut	Action	Best Use
`Ctrl+a %`	Vertical Split	Code + terminal side-by-side
`Ctrl+a "`	Horizontal Split	Editor above, logs below
`Ctrl+a h/j/k/l`	Navigate Panes	Vim-like movement
`Ctrl+a H/J/K/L`	Resize Panes	Hold Ctrl+a, tap multiple times
`Ctrl+a z`	Zoom Pane	Focus mode - toggle fullscreen
`Ctrl+a x`	Close Pane	Clean up splits

📋 Copy & Paste

Shortcut	Action	Note
`Ctrl+a [`	Enter Copy Mode	Scroll through history
`v` (in copy)	Begin Selection	Like Vim visual mode
`y` (in copy)	Copy & Exit	Auto-copies to system clipboard
`Ctrl+a p`	Paste	Paste tmux clipboard

🔧 Plugin Management

Shortcut	Action	When to Use
`Ctrl+a I`	Install Plugins	After adding plugin to config
`Ctrl+a Ctrl+s`	Save Session	Manual session backup
`Ctrl+a Ctrl+r`	Restore Session	Manual session restore

🐚 ZSH Custom Aliases & Functions

📁 File Navigation (Modern Replacements)

Command	Replaces	What You Get
`ls`	`ls`	Icons + Git status with `eza`
`ll`	`ls -la`	Detailed view with colors
`tree`	`tree`	Beautiful directory structure
`cd`	`cd`	Smart navigation with `zoxide`
`cat`	`cat`	Syntax highlighting with `bat`
`grep`	`grep`	Faster search with `ripgrep`

⚡ Productivity Functions

Function	What It Does	Daily Example
`gia`	Git Interactive Add	Changed 10 files, commit only 3
`gco`	Git Checkout Interactive	Fuzzy search branches
`glo`	Git Log Interactive	Beautiful searchable commit history
`mkcd <dir>`	Make & CD	`mkcd new-project` - one command
`fer`	Find & Edit Recent	Files modified in last 24h
`del`	Interactive Delete	Safe multi-select file deletion
`feh`	Find & Edit Header	`feh libft` - instant header access
`todo`	Find TODO/FIXME	Project-wide task list
`port <num>`	Check Port Usage	`port 3000` - see what's using it
`weather`	Weather Forecast	Terminal weather for your location

🔨 Development Shortcuts

Alias	Full Command	Use Case
`gs`	`git status`	Quick repo status
`gd`	`git diff`	See file changes
`..`	`cd ../`	Up one directory
`...`	`cd ../../`	Up two directories
`c`	`clear`	Clear terminal
`h`	`history`	Command history
`fkill`	Interactive kill	Fuzzy search processes to kill

🔍 FZF (Fuzzy Finder) Power Commands

Shortcut	Action	Daily Use
`Ctrl+R`	Command History	**Stop using up-arrow** - fuzzy search history
`Ctrl+T`	File Path Insert	Type `vim` then `Ctrl+T` - instant file picker
`Alt+C`	Fuzzy CD	Jump to any directory quickly

💻 Modern CLI Tools

📊 System Monitoring

Command	Replaces	Upgrade
`btop`	`htop/top`	Beautiful system dashboard
`procs`	`ps`	Clean process list with colors
`dust`	`du`	Visual disk usage
`duf`	`df`	Pretty disk free info

📄 File Operations

Command	Purpose	Example
`fd .c`	Find files	All C files recursively
`bat file.sh`	Pretty file view	Syntax highlighted cat
`rg "function"`	Fast search	Project-wide text search
`ranger` or `r`	File manager	Vim-keys file browser
`mc`	Dual-pane manager	Traditional file operations

🛠️ Developer Tools

Command	Purpose	42 School Use
`glow README.md`	Pretty markdown	Beautiful README viewing
`jq`	JSON processor	API response formatting
`tldr tar`	Quick examples	Skip man pages - see examples
`ipcalc 10.11.25.100/23`	Network calc	netpractice project helper
`unp file.rar`	Universal extract	Any archive format
`termdown 25m`	Pomodoro timer	Focus sessions

🎨 VIM IDE Configuration

🎯 Leader Key System

Leader = Spacebar - All custom shortcuts start with Space

Shortcut	Action	Usage
`Space w`	Quick Save	Instant `:w`
`Space d`	Show Error Details	ALE error popup
`Space cc`	Comment Line/Block	Toggle comments
`Space cu`	Uncomment	Remove comments
`Space j`	Format JSON	Pretty print JSON
`Space l/h`	Next/Prev Buffer	Cycle open files

📂 File Navigation

Key	Plugin	Action
`Ctrl+n`	NERDTree	Toggle file explorer
`Ctrl+p`	CtrlP	Fuzzy file finder
`Ctrl+j/k`	Custom	Move between splits

🔄 Advanced Vim Features

Search & Replace Power

Command	Action	Pro Tip
`*`	Search word under cursor	Then use `n/N` to navigate
`ciw`	Change inner word	Replace word under cursor
`.`	Repeat last change	**Most powerful command**
`%s/old/new/gc`	Global replace with confirm	Safe mass replace

Registers (Multiple Clipboards)

Command	Action	Note
`:reg`	Show all registers	See what you've copied
`"2p`	Paste from register 2	Access any clipboard
`"+y`	Copy to system clipboard	Share with other apps
`"+p`	Paste from system clipboard	Get text from outside Vim

Macros (Automation)

Command	Action	Workflow
`qa`	Record macro to 'a'	Start recording keystrokes
`q`	Stop recording	End macro recording
`@a`	Play macro 'a'	Execute recorded actions
`10@a`	Play macro 10 times	Batch automation

🎪 Integrated Workflow Examples

🌅 Morning Startup Routine

```
# Start your day
t main-project         # Attach to main project session
# Inside tmux:
Ctrl+a j               # Switch between projects
Ctrl+a c               # New window for different task
```

🔥 Development Flow

```
# Navigate and edit
cd proj                # zoxide smart cd
fd .c                  # find C files
vim main.c             # open in vim
Ctrl+p                 # fuzzy find other files
Space w                # quick save

# Debug and test
todo                   # see all TODOs
port 8080              # check what's using port
fkill                  # kill hanging processes
```

🔍 Search & Research

```
# Find things fast
Ctrl+R                 # fuzzy command history
rg "function_name"     # search in all files
tldr tar               # quick examples
glow README.md         # pretty documentation
```

🎯 Focus Session

```
termdown 25m           # start pomodoro
Ctrl+a z               # zoom pane for focus
# Work intensely
Ctrl+a z               # unzoom when break time
```

🆘 Emergency Commands

Situation	Command	Note

Stuck in Vim	`:q!`	Force quit without saving
Process won't die	`fkill` then search	Interactive process killer
Port conflict	`port <number>`	See what's using the port
Lost in directories	`cd -`	Toggle last two locations
Need system info	`btop`	Full system dashboard
Config broken	`Ctrl+a r`	Reload tmux config

🏆 Pro Tips for 42 School

Project Organization

```
# Start new project
mkcd push_swap
git init
t push_swap          # dedicated tmux session

# Window layout:
# Window 1: Editor (vim)
# Window 2: Testing (tests, debugging)
# Window 3: Monitoring (norminette, valgrind)
```

Code Quality Workflow

```
# Before submitting
todo                # check all TODOs
git status          # review changes
gia                 # interactive add only what you want
```

Collaboration

```
# Share session (peer learning)
tmux -S /tmp/shared new-session -d -s shared
chmod 777 /tmp/shared
# Others join with:
tmux -S /tmp/shared attach -t shared
```

💡 ***Memory Palace Technique***: *Practice one section per day. Start with tmux basics, then add zsh aliases, then vim. Muscle memory builds through repetition, not cramming.*

1. CURL & API Testing Utilities

Basic CURL Aliases

Alias	Full Command	Purpose	Example Usage
`cdwn`	`curl -L -C - -O`	Resumable download with auto-filename	`cdwn https://site.com/large-file.zip`
`cdown`	`curl -L -C - -o`	Resumable download with custom filename	`cdown myfile.zip https://site.com/file.zip`
`cks`	`curl -L -k`	Skip SSL verification (dev/testing)	`cks https://dev-api.internal:8443/status`
`chead`	`curl -I -L`	Fetch headers only	`chead https://cdn.example.com/logo.png`
`cverb`	`curl -v -L`	Verbose debugging output	`cverb https://api.example.com/endpoint`

API Testing Functions

Function	Syntax	Purpose	Example Usage	Real-World Scenario
`cgetjson`	`cgetjson <URL>`	GET request with pretty JSON output	`cgetjson https://api.example.com/users/123`	**Post-Deploy Sanity Check**: After deploying a new feature endpoint, quickly verify the response structure and new fields are present
`cpost`	`cpost <URL> <DATA>`	POST JSON data (string or file)	`cpost https://api.example.com/users '{"name":"John","email":"john@mail.com"}'`	**Testing User Registration**: Simulate new user signup without using GUI. Create `new_user.json` file and run: `cpost https://api.app.com/register @new_user.json`
`cput`	`cput <URL> <DATA>`	PUT JSON data to update resource	`cput https://api.example.com/users/123 '{"status":"active"}'`	**Quick Data Fix (Emergency)**: Customer reports incorrect profile data. Update directly: `cput https://api.app.com/profile/456 '{"status":"active","phone":"new-number"}'`
`cdel`	`cdel <URL>`	DELETE request to remove resource	`cdel https://api.example.com/users/test-999`	**Cleanup After E2E Testing**: After test suite fails to clean up, manually remove remnant test data

Advanced Network Functions

Function	Syntax	Purpose	Example Usage	Real-World Scenario
`cresolve`	`cresolve <DOMAIN> <IP:PORT> <URL>`	Test DNS override for local dev	`cresolve api.prod.com 127.0.0.1:8080 https://api.prod.com/status`	**Load Balancer Testing**: Launching new K8s cluster with service IP `10.0.0.5`, but DNS won't go live for hours. Test production ingress controller before launch by forcing local

Function	Syntax	Purpose	Example Usage	Real-World Scenario
				machine to treat new IP as live server
`chost`	`chost <HOST_HEADER> <URL>`	Override Host header for testing	`chost app-b.com http://192.168.1.5:80`	**Multi-App Server Testing**: Single web server hosts multiple apps (app-a.com, app-b.com) based on Host header. Test if server handles requests correctly when hitting raw IP
`cauth`	`cauth <USER> <PASSWORD> <URL>`	Test basic authentication	`cauth admin secret123 https://api.example.com/admin`	**Testing JWT/Basic Auth Middleware**: Implementing auth middleware. Check exact error codes (401 vs 403) and custom headers returned for valid/invalid credentials

Complete Usage Examples

```
# Quick health check on production incident call
curl https://api.site.com/health

# Resume interrupted 5GB database dump download
cdwn https://repository.com/large-database-dump-v2.sql.gz

# Verify CDN caching after asset deployment
chead https://prod-assets.cdn.com/logo.png

# Debug legacy API timeout issues
cverb https://api.site.com/legacy-service

# Sanity check after deploying new feature
cgetjson https://api.app.com/v2/orders/123

# Simulate user registration
cpost https://api.app.com/register @new_user.json

# Emergency profile update
cput https://api.app.com/profile/456 '{"status":"active","phone":"555-0100"}'

# Clean up test data
cdel https://api.app.com/user/test-id-999

# Test new K8s cluster before DNS goes live
cresolve prod.app.com 10.0.0.5:443 https://prod.app.com/health

# Test multi-app server configuration
chost app-b.com http://192.168.1.5:80
```

```
# Test authentication middleware
cauth admin secretpass https://api.example.com/admin
```

---

2. JQ JSON Processing Utilities

Basic JQ Aliases

Alias	Full Command	Purpose	Example Usage
`jqp`	`jq .`	Pretty print JSON	`cgetjson <url> | jqp`
`jqk`	`jq keys`	List all keys in JSON object	`cgetjson <url> | jqk`
`jql`	`jq length`	Count items in array/object	`cgetjson <url> | jql`

JQ Helper Functions

Function	Syntax	Purpose	Example Usage	Real-World Scenario
`jval`	`... | jval <KEY>`	Extract single value by key	`cgetjson <url> | jval version`	**Extracting Configuration Value**: Check current version number deployed in service config file
`jfield`	`... | jfield <KEY>`	Extract field from array of objects	`cgetjson /transactions | jfield transaction_id`	**Auditing Database IDs**: Fetch list of recent transactions and get only IDs for log tracing
`jfields`	`... | jfields <KEY1> <KEY2> ...`	Extract multiple fields as table	`cgetjson /services | jfields name status env`	**Summarizing Server Health**: Display all microservice instances with their status, last reported time, and environment tag in readable table
`jfind`	`... | jfind <KEY> <VALUE>`	Filter array by condition	`cgetjson /logs | jfind error_code "E_500_DB_CONN"`	**Troubleshooting Specific Record**: Search through thousands of logs for exact error code

Complete Usage Examples

```
# Check deployed service version
cat config.json | jval version

# Get all transaction IDs for log tracing
cgetjson https://api.example.com/transactions | jfield transaction_id

# Display microservices health summary table
cgetjson https://api.example.com/services | jfields service_name status environment
# Output:
# SERVICE_NAME    STATUS    ENVIRONMENT
# Auth-Service-2  UP        Production
# User-Service-1  DOWN      Testing
# Payment-API     UP        Production

# Find specific error in logs
cgetjson https://api.example.com/logs | jfind error_code "E_500_DB_CONN"
```

```
# Get all active user emails
cgetjson https://api.example.com/users | jfind status "active" | jfield email

# Extract all microservice IDs
cgetjson https://api.prod.com/services | jfield service_id

# Find user by username
cgetjson https://api.prod.com/users | jfind username "ymazini"

# Check feature flag values in config map
cgetjson https://k8s.cluster/config/map | jval feature_flag_prod

# Get deployment status summary
cgetjson https://api.prod.com/deployments | jfields id status timestamp
```

3. Essential Day-to-Day Functions

Top 5 Most Used Functions

Function	Syntax	Purpose	Example Usage	Time Saved/Day
`extract`	`extract <archive>`	Universal archive extractor (all formats)	`extract project.tar.gz`	5-10 min
`gitignore`	`gitignore <language>`	Generate .gitignore for language/framework	`gitignore python`	10 min/project
`backup`	`backup <file/dir>`	Create timestamped backup	`backup important_file.c`	Critical
`serve`	`serve [port]`	Start HTTP server in current directory	`serve 3000`	5 min
`pfind` / `fkill`	`pfind`	Interactive process finder and manager	`pfind`	2-5 min

Detailed Usage Examples

`extract` - Universal Archive Extractor

Supported formats: .tar.gz, .tar.bz2, .tar.xz, .zip, .rar, .7z, .gz, .bz2

```
# Extract any archive format
extract downloaded_package.tar.gz
extract project.zip
extract dependency.tar.bz2
extract backup.7z

# Real-world scenario: Downloaded dependencies
extract node-v18.tar.xz
# No need to remember: tar -xJf node-v18.tar.xz
```

`gitignore` - Instant .gitignore Generator

```
# Single language
gitignore python
gitignore c
gitignore node

# Multiple technologies
gitignore c,vim,linux
gitignore python,venv,vscode

# Real-world scenario: Starting new C project at 42
gitignore c,vim,linux
# Output: ✅ .gitignore created for: c,vim,linux
#         📄 Preview: [shows first 20 lines]
```

`backup` - Smart Timestamped Backup

```
# Backup single file
backup libft.h
# Creates: libft.h_backup_20250103_143022
# Output: ✅ Backed up: libft.h_backup_20250103_143022
#         📦 Size: 4.2K

# Backup entire directory
backup push_swap/
# Creates: push_swap_backup_20250103_143022/

# Real-world scenario: Before major refactoring
backup src/
# Safe experimentation - can revert anytime
```

`serve` - Instant HTTP Server

```
# Start server on default port 8000
serve
# Output: 🌐 Server: http://localhost:8000 | 📂 /home/user/project | ⏹️ Ctrl+C to stop

# Start on specific port
serve 3000
# Output: 🌐 Server: http://localhost:3000

# Real-world scenarios:
# 1. Test static HTML/CSS project
cd my-website
serve
# Open browser: http://localhost:8000
# 2. Share files with teammate on same network
serve 8080
# Tell teammate: http://your-ip:8080

# 3. Test API documentation
cd api-docs
serve
```

`pfind` - Interactive Process Manager

```
# Launch interactive process finder
pfind

# Steps:
# 1. Fuzzy search appears with all processes
# 2. Type to filter: "node", "python", "vim"
# 3. Select process(es) with Tab (multi-select)
# 4. Choose action:
#    1 = Show details
#    2 = Kill (SIGTERM)
#    3 = Force kill (SIGKILL)
#    4 = Cancel

# Real-world scenario: Node process stuck
pfind
# Type: "node"
# Select stuck process
# Choose: 2 (Kill)
# Output: ✅ Sent SIGTERM to process(es)
```

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4. TMUX Power Commands

Session Management

Command	Action	Example Usage	Best Practice
`t <name>`	Create or attach to session	`t myproject`	Primary entry point - one session per project
`Ctrl+a j`	Pop-up session switcher	*Press keys*	Most used - fuzzy search all projects
`Ctrl+a d`	Detach from session	*Press keys*	End of day - keeps everything running
`tmux attach`	Re-attach to last session	`tmux attach`	Next day - restore entire workspace
`Ctrl+a r`	Reload tmux config	*Press keys*	After editing ~/.tmux.conf

Window Management (Virtual Tabs)

Shortcut	Action	Example Usage
`Ctrl+a c`	Create new window	Separate major tasks

Shortcut	Action	Example Usage
`Ctrl+a ,`	Rename window	Name it immediately and meaningfully
`Ctrl+a n`	Next window	Primary navigation forward
`Ctrl+a p`	Previous window	Primary navigation backward
`Ctrl+a 1-9`	Jump to window number	`Ctrl+a 3` → Jump to window 3
`Ctrl+a &`	Close window	Clean up finished tasks

Pane Management (Split Screens)

Shortcut	Action	Best Use Case
`Ctrl+a %`	Vertical split	Code + terminal side-by-side
`Ctrl+a "`	Horizontal split	Editor above, logs below
`Ctrl+a h/j/k/l`	Navigate panes	Vim-like movement between panes
`Ctrl+a H/J/K/L`	Resize panes	Hold Ctrl+a, tap multiple times
`Ctrl+a z`	Zoom pane (toggle fullscreen)	Focus mode on single pane
`Ctrl+a x`	Close pane	Clean up unnecessary splits

Copy & Paste

Shortcut	Action	Note
`Ctrl+a [`	Enter copy mode	Scroll through history with arrow keys
`v` (in copy mode)	Begin selection	Like Vim visual mode
`y` (in copy mode)	Copy and exit	Auto-copies to system clipboard
`Ctrl+a p`	Paste from tmux buffer	Paste copied text

Plugin Management

Shortcut	Action	When to Use
`Ctrl+a I`	Install plugins	After adding plugin to .tmux.conf
`Ctrl+a Ctrl+s`	Save session	Manual session backup
`Ctrl+a Ctrl+r`	Restore session	Manual session restore

Real-World TMUX Workflow

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5. Vim IDE Commands

Leader Key System

Leader Key: `Spacebar` - All custom shortcuts start with Space

Shortcut	Action	Usage
`Space w`	Save file	Instant `:w`
`Space q`	Quit	Quick exit
`Space wq`	Save and quit	Combined action

Shortcut	Action	Usage
`Space d`	Show error details	ALE error popup
`Space cc`	Comment line/block	Toggle comments
`Space cu`	Uncomment	Remove comments
`Space j`	Format JSON	Pretty print JSON file
`Space l`	Next buffer	Cycle to next open file
`Space h`	Previous buffer	Cycle to previous file

File Navigation

Key	Plugin	Action
`Ctrl+n`	NERDTree	Toggle file explorer sidebar
`Ctrl+p`	CtrlP	Fuzzy file finder
`Ctrl+j`	Custom	Move down between splits
`Ctrl+k`	Custom	Move up between splits

Search & Replace Power Commands

Command	Action	Pro Tip
`*`	Search word under cursor	Then use `n` / `N` to navigate matches
`ciw`	Change inner word	Replace word under cursor
`.`	Repeat last change	Most powerful command in Vim
`:%s/old/new/gc`	Global search/replace with confirm	Safe mass replace across file

Registers (Multiple Clipboards)

Command	Action	Note
`:reg`	Show all registers	See everything you've copied
`"2p`	Paste from register 2	Access any previous clipboard
`"+y`	Copy to system clipboard	Share with other apps
`"+p`	Paste from system clipboard	Get text from outside Vim

Macros (Automation)

Command	Action	Workflow
`qa`	Record macro to register 'a'	Start recording keystrokes
`q`	Stop recording	End macro recording
`@a`	Play macro 'a'	Execute recorded actions
`10@a`	Play macro 10 times	Batch automation

Custom Commands

Command	Action	Example Usage
`:Format`	Auto-format code using ALE	`:Format` in any file

Command	Action	Example Usage
`:GStatus`	Git status in vertical split	`:GStatus` to see changes

Real-World Vim Workflow

```
" Opening project
vim main.c
Ctrl+p              " Fuzzy find other files
" Type: "utils" → finds utils.c, utils.h

" Editing workflow
Space w             " Quick save
ciw                 " Change word under cursor
.                   " Repeat change on next word
*                   " Search all occurrences of current word
n                   " Jump to next occurrence

" Working with JSON
Space j             " Format JSON file automatically

" Code formatting before submission
:Format             " Auto-format with ALE

" Multi-file editing
Ctrl+p              " Open another file
Space l             " Cycle between open files
Space h             " Go back to previous file

" Comment/Uncomment blocks
Space cc            " Comment selected lines
Space cu            " Uncomment lines

" Using system clipboard
"+yy                " Copy current line to system clipboard
"+p                 " Paste from system clipboard

" Macro example: Add semicolons to 50 lines
qa                  " Start recording to 'a'
A;<Esc>j            " Add semicolon at end, go to next line
q                   " Stop recording
50@a                " Apply to 50 lines
```

6. Git Workflow Enhancement

Interactive Git Functions

Function	Action	Example Usage	Daily Use Case
`gia`	Interactive git add with preview	`gia`	Changed 10 files, want to commit only 3. Use fuzzy search with preview to select specific files
`gco`	Interactive branch checkout	`gco`	Fuzzy search through all branches (local & remote) to quickly switch
`glo`	Interactive git log viewer	`glo`	Beautiful searchable commit history with diffs

Enhanced Git Aliases

Alias	Full Command	Use Case
`gs`	`git status`	Quick repo status check
`gd`	`git diff`	See file changes before commit
`gp`	`git push`	Push commits
`gl`	`git pull`	Pull latest changes
`gc`	`git commit`	Commit with message prompt
`gb`	`git branch`	List all branches
`gundo`	`git reset --soft HEAD~1`	Undo last commit (keep changes)
`gwip`	`git add -A && git commit -m "WIP"`	Quick WIP commit for end of day
`gclean`	`git branch --merged | ... | git branch -d`	Delete all merged branches

Real-World Git Workflow Examples

```
# Morning: Start working on feature
gco                    # Interactive branch selection
# Type: "feature/auth" → switches to branch

# During work: Check changes
gs                     # See modified files
gd                     # Review actual changes

# Selective staging with preview
gia
# Fuzzy search appears showing all changed files
# Multi-select files you want to commit
# Preview shows actual diff for each file
# Press Enter to stage selected files

# Commit with meaningful message
gcm "Add authentication middleware with JWT support"

# Review commit history beautifully
glo
# Interactive log with colors and graph
# Search through commits
# Preview each commit's diff
# End of day: Quick WIP commit
gwip                    # Commits everything as "WIP"

# Before push: Undo WIP if needed
gundo                   # Undo last commit, keep changes

# Cleanup after feature merge
gclean                  # Delete all merged branches

# Emergency: Pushed wrong commit
gundo                   # Undo commit locally
gp --force              # Force push (use carefully!)
```

7. File Operations & Navigation

Modern CLI Replacements

Old Command	New Command	What You Get	Example
`ls`	`ls` (aliased to eza)	Icons + Git status + colors	`ls`
`ls -la`	`ll`	Detailed view with permissions	`ll`
`tree`	`tree` (aliased to eza)	Beautiful directory structure	`tree`
`cd`	`cd` (aliased to zoxide)	Smart navigation with frecency	`cd proj`
`cat`	`cat` (aliased to bat)	Syntax highlighting	`cat script.sh`
`grep`	`grep` (aliased to rg)	Faster search	`grep "function" *.c`

File Management Functions

Function	Syntax	Purpose	Example Usage
`mkcd`	`mkcd <directory>`	Make directory and cd into it	`mkcd new-project`
`vf`	`vf`	Find and edit file with fuzzy search	`vf` → type filename → opens in vim
`cf`	`cf`	Find and view file	`cf` → type filename → displays with cat
`fgr`	`fgr`	Find in files and open in editor	`fgr` → search text → jump to line in vim
`fer`	`fer`	Find and edit recent files (last 24h)	`fer` → shows recently modified files
`feh`	`feh <project>`	Find and edit header file	`feh libft` → opens libft.h
`del`	`del`	Interactive file deletion with preview	`del` → multi-select files → delete
`backup`	`backup <file>`	Create timestamped backup	`backup main.c`

Disk Usage Aliases

Alias	Purpose	Example Output
`bigdirs`	Show directories >10MB	Shows large directories sorted by size
`bigfiles`	Show files >10MB	Lists large files with human-readable sizes
`bigstuff`	Show both large dirs and files	Comprehensive disk usage overview

Alias	Purpose	Example Output
`duh`	Disk usage of current directory	Shows all items including hidden files
`du10`	Top 10 largest items	Quick summary of space hogs

Real-World File Operations Examples

```
# Quick project setup
mkcd push_swap
# Creates directory and enters it immediately

# Find and edit configuration
vf
# Type: "config"
# Shows: config.json, .config, etc. with preview
# Select file → opens in vim

# Search across entire project
fgr
# Type: "ft_strlen"
# Shows all occurrences with line numbers
# Select one → opens file at that exact line

# Find recent changes
fer
# Shows all files modified in last 24h
# Select one → opens in vim

# Quick header access (42 School projects)
feh libft
# Instantly opens libft.h or libft_bonus.h

# Safe file deletion
del
# Shows all files with fuzzy search
# Multi-select unwanted files
# Preview before deletion
# Confirm and delete

# Find what's eating disk space
bigstuff
# === LARGE DIRECTORIES ===
# 2.3G    ./node_modules
# 1.1G    ./.git
# 450M    ./build
#
# === LARGE FILES ===
# 850M    ./database.sql
# 320M    ./video.mp4

# Clean up current directory
duh
# 1.5G    ./src
# 890M    ./.cache
# 120M    ./docs
```

---

8. System Monitoring & Management

Modern System Tools

System Information Aliases

Alias	Purpose	Example Output
`ports`	Show all open ports	Lists all listening ports and services
`myip`	Get public IP address	Returns your public IP instantly

Process & Port Management

Function/Alias	Syntax	Purpose	Example Usage
`port`	`port <number>`	Check what's using a port	`port 3000`
`pfind`	`pfind`	Interactive process finder	`pfind` → search → kill
`fkill`	`fkill`	Fuzzy search and kill process	`fkill` → type "node" → kill

---

9. Docker Utilities

Docker Aliases

Alias	Full Command	Purpose	Example Usage
`dps`	`docker ps --format "table ..."`	Clean docker ps output	`dps`
`dstop`	`docker stop $(docker ps -q)`	Stop all running containers	`dstop`
`dclean`	`docker system prune -af`	Clean everything (images, containers, volumes)	`dclean`

Real-World Docker Examples

```
# View running containers cleanly
dps
# NAMES          STATUS        PORTS
# web-api        Up 2 hours    0.0.0.0:3000→3000/tcp
# postgres-db    Up 2 hours    0.0.0.0:5432→5432/tcp
# redis-cache    Up 2 hours    0.0.0.0:6379→6379/tcp

# Stop all containers quickly
dstop
```

```
# Stops: web-api, postgres-db, redis-cache

# Clean up disk space
dclean
# Removes:
# - All stopped containers
# - All unused networks
# - All dangling images
# - All build cache
```

10. Real-World Workflow Examples

```
# 1. Start development session
t api-project
Ctrl+a %                    # Vertical split
# Left: Code | Right: API testing

# 2. Develop endpoint
vim src/auth.js
Space w                     # Save

# 3. Test endpoint immediately (right pane)
Ctrl+a l                    # Move to right pane

# Test health check
cgetjson http://localhost:3000/health
# {
#   "status": "ok",
#   "timestamp": "2025-01-03T14:30:22Z"
# }

# Create test user
cpost http://localhost:3000/users '{"username":"testuser","email":"test@mail.com"}'
# {
#   "id": 123,
#   "username": "testuser",
#   "created_at": "2025-01-03T14:30:45Z"
# }

# Update user profile
cput http://localhost:3000/users/123 '{"status":"active","role":"admin"}'

# Get all users and extract emails
cgetjson http://localhost:3000/users | jfield email

# Find specific user
```

```
cgetjson http://localhost:3000/users | jfind username "testuser"

# Delete test user
cdel http://localhost:3000/users/123
```

Scenario 3: Debugging Production Issue

```


# 3. Check API health
chead https://api.prod.com/health
# HTTP/1.1 503 Service Unavailable
# X-Error: Database connection timeout

# 4. Test with verbose output
cverb https://api.prod.com/health
# Shows TLS handshake, connection time, DNS resolution

# 5. Check database connectivity
cgetjson https://api.prod.com/debug/db-status | jval status

# 6. Test load balancer routing
cresolve api.prod.com 10.0.0.5:443 https://api.prod.com/health
# Tests specific backend server

# 7. Check all microservices status
cgetjson https://api.prod.com/services | jfields name status last_seen
# SERVICE_NAME     STATUS    LAST_SEEN
# auth-service     UP        2025-01-03T14:35:00Z
# user-service     DOWN      2025-01-03T14:20:00Z  ← Problem!
# payment-service  UP        2025-01-03T14:34:55Z

# 8. Restart problematic service
pfind                      # Find user-service process
# Select → Kill → Restart monitoring
```

Scenario 5: Working with JSON APIs

```
# 1. Fetch data and explore structure
cgetjson https://api.github.com/users/yomazini
# See full JSON structure

# 2. Extract specific fields
cgetjson https://api.github.com/users/yomazini | jval login
# Output: yomazini
```

```
cgetjson https://api.github.com/users/yomazini | jval public_repos
# Output: 42

# 3. Work with arrays
cgetjson https://api.github.com/users/yomazini/repos | jfield name
# Lists all repo names

# 4. Create summary table
cgetjson https://api.github.com/users/yomazini/repos | jfields name language stars
# NAME              LANGUAGE    STARS
# dotfiles          Shell       156
# push_swap         C           23
# minishell         C           45

# 5. Filter specific repos
cgetjson https://api.github.com/users/yomazini/repos | jfind language "C"
# Shows only C language repos

# 6. Complex workflow: Find most starred C repos
cgetjson https://api.github.com/users/yomazini/repos | \
  jfind language "C" | \
  jfields name stars | \
  sort -k2 -nr
# Sorted by stars (descending)

 cgetjson https://api.github.com/users/yomazini/repos | jfind language "Shell" | grep html_url
```

Scenario 7: File Organization & Cleanup

```
# 1. Identify disk space issues
bigstuff
# === LARGE DIRECTORIES ===
# 3.2G    ./node_modules
# 1.8G    ./.cache
# 950M    ./build
#
# === LARGE FILES ===
# 1.2G    ./database-backup.sql
# 850M    ./video-demo.mp4
# 420M    ./old-logs.tar.gz

# 2. Navigate to problem area
cd ~/.cache                    # Smart cd with zoxide

# 3. See what's inside
tree -L 2                      # Two levels deep
```

```
duh                    # Disk usage of current dir

# 4. Interactive cleanup
del
# Fuzzy search appears
# Type to filter: "log"
# Multi-select old log files
# Preview each file
# Confirm deletion

# 5. Verify space recovered
diskinfo
# Filesystem     Size  Used  Avail Use%
# /dev/sda1      100G   45G    50G  47%  ← Was 95% before

# 6. Backup before major cleanup
backup important-data/
# Creates: important-data_backup_20250103_153022/
# Then safely clean up
```

Scenario 8: Testing with Local Development Server

```
# 1. Start project
cd my-website
tree                   # See structure
# .
# ├── index.html
# ├── css/
# │   └── style.css
# ├── js/
# │   └── app.js
# └── images/

# 2. Start local server
serve 8080
# 🌐 Server: http://localhost:8080
# 📂 /home/user/my-website
# ⏹️  Press Ctrl+C to stop

# 3. Test in browser (open another terminal)
Ctrl+a c               # New tmux window
curl -I http://localhost:8080
# HTTP/1.0 200 OK
# Content-Type: text/html

# 4. Make changes
Ctrl+a p               # Previous window (back to editor)
```

```
vim index.html
Space w                # Save
# Refresh browser - changes visible immediately

# 5. Share with teammate on same network
myip                   # Get your IP
# 192.168.1.50
# Tell teammate: http://192.168.1.50:8080
```

Scenario 9: Git Branch Management

```
# 1. See all branches
gb
# * main
#   feature/auth
#   feature/payments
#   bugfix/login-issue
#   old-experiment

# 2. Interactive checkout
gco
# Fuzzy search appears with all branches
# Type: "auth"
# Select: feature/auth
# Switches immediately

# 3. Work and commit
vim src/auth.js
gia                    # Interactive add
gcm "Implement JWT authentication"

# 4. Review commit history
glo
# Interactive log with graph
# Search through commits
# Preview diffs

# 5. After merge: clean up old branches
gclean
# Deleting local branches that are merged:
# Deleted branch old-experiment
# Deleted branch bugfix/login-issue

# 6. Quick WIP at end of day
gwip
# Everything committed as "WIP"
# Next morning: undo WIP and commit properly
gundo                    # Undo WIP commit (keeps changes)
gia                      # Interactive add specific files
gcm "Complete authentication feature"
```

Scenario 10: Advanced Archive & File Management

```
# 1. Download large file (resumable)
cdwn https://releases.ubuntu.com/22.04/ubuntu-22.04.3-desktop-amd64.iso
# Download starts...
# Connection drops at 70%
# Run same command again:
cdwn https://releases.ubuntu.com/22.04/ubuntu-22.04.3-desktop-amd64.iso
# Automatically resumes from 70%!

# 2. Extract downloaded archive
extract ubuntu-22.04.3-desktop-amd64.iso
# Works automatically - no need to remember flags

# 3. Backup before modifications
backup project-files/
# Creates: project-files_backup_20250103_160532/
# Size: 245M

# 4. Find and edit recent work
fer
# Shows files modified in last 24h:
# - src/main.c (modified 2 hours ago)
# - config/app.json (modified 5 hours ago)
# - docs/README.md (modified 12 hours ago)
# Select one → opens in vim

# 5. Search across all files
fgr
# Type: "TODO"
# Shows all TODOs with context
# Select one → jumps to exact line in vim

# 6. Copy important config to clipboard
cat config.json | cpy
# ✅ Copied piped output to clipboard
# Or: cpy config.json
# ✅ Copied content of file: config.json
```

11. Quick Reference Summary Tables

Most Used Commands (Top 20)

Rank	Command	Purpose	Frequency
1	`ll`	List files with details	50+ times/day
2	`gs`	Git status	30+ times/day
3	`Ctrl+a h/j/k/l`	Navigate tmux panes	100+ times/day
4	`Space w`	Save in vim	200+ times/day
5	`Ctrl+p`	Fuzzy find files in vim	50+ times/day
6	`vf`	Find and edit file	20+ times/day
7	`t <project>`	Switch/create tmux session	10+ times/day
8	`gco`	Interactive git checkout	10+ times/day
9	`gia`	Interactive git add	15+ times/day
10	`cgetjson`	Fetch and view JSON	20+ times/day
11	`Ctrl+a c`	New tmux window	15+ times/day
12	`cd <dir>`	Smart directory jump	50+ times/day
13	`cat <file>`	View file with syntax	30+ times/day
14	`port <num>`	Check port usage	5+ times/day
15	`backup`	Create backup	5+ times/day
16	`extract`	Extract any archive	3+ times/day
17	`serve`	Start local server	5+ times/day
18	`todo`	Find TODOs	5+ times/day
19	`glo`	Interactive git log	8+ times/day
20	`pfind`	Find and manage processes	3+ times/day

Command Categories by Use Case

API Development & Testing

```
cgetjson → cpost → cput → cdel
jval → jfield → jfields → jfind
chead → cverb → chost → cauth → cresolve
```

File Management

```
vf → cf → fgr → fer → feh → del
extract → backup → mkcd
ll → tree → duh → bigstuff
```

Git Workflow

```
gs → gd → gia → gco → glo
gcm → gp → gl → gundo → gwip → gclean
```

TMUX Productivity

```
t → Ctrl+a j → Ctrl+a c → Ctrl+a h/j/k/l
Ctrl+a % → Ctrl+a " → Ctrl+a z
```

System Monitoring

```
btop → procs → dust → duf
meminfo → cpuinfo → diskinfo → ports
port → pfind → fkill → myip
```

Development Tools

```
serve → gitignore → todo
Space w → Ctrl+p → :Format
extract → cpy → weather
```

Keyboard Shortcuts Master List

TMUX Navigation

```
Ctrl+a h      ← Navigate left
Ctrl+a j      ↓ Navigate down
Ctrl+a k      ↑ Navigate up
Ctrl+a l      → Navigate right
Ctrl+a H      ← Resize left (hold Ctrl+a, tap H multiple times)
Ctrl+a J      ↓ Resize down
Ctrl+a K      ↑ Resize up
Ctrl+a L      → Resize right
```

Vim Editing

```
Space w       Save file
Space q       Quit
Space wq      Save and quit
Space d       Show error details
Space j       Format JSON
Space cc      Comment line(s)
Space cu      Uncomment line(s)
Ctrl+n        Toggle NERDTree
Ctrl+p        Fuzzy file finder
```

Shell Navigation

```
Ctrl+R      Command history (fuzzy)
Ctrl+T      File path insert (fuzzy)
Alt+C       Fuzzy cd to directory
```

Time-Saving Metrics

Task	Old Method	New Method	Time Saved
Extract tar.gz	Google flags → `tar -xzf`	`extract file.tar.gz`	~2 min
Create .gitignore	Copy from old project	`gitignore python`	~10 min
Find file in project	`find . -name "*.c" | grep ...`	`vf` + type name	~1 min
Test API endpoint	Open Postman/Insomnia	`cgetjson <url>`	~30 sec
Find process to kill	`ps aux | grep | awk | kill`	`pfind`	~1 min
Switch git branch	`git branch | grep | git checkout`	`gco` + type	~30 sec
Start local server	Install http-server globally	`serve`	~2 min
Backup before edit	`cp -r project project.bak`	`backup project`	~30 sec
Review git history	`git log --oneline | less`	`glo` (interactive)	~1 min
Extract JSON field	`curl | grep | sed | awk`	`cgetjson | jval key`	~2 min

Total time saved per day: ~45-60 minutes
Weekly savings: ~5-7 hours
Monthly savings: ~20-28 hours

12. Installation & Setup Checklist

Prerequisites

```
✓ Vim 8.0+
✓ Tmux 3.0+
✓ Zsh 5.8+
✓ Git 2.0+
✓ Python 3.6+
✓ Node.js (optional, for some tools)
```

Required Tools

```
# Core tools
sudo apt install -y curl git vim tmux zsh fzf ripgrep bat fd-find

# Modern replacements
sudo apt install -y exa zoxide procs dust duf btop

# Development tools
pip3 install --user autopep8 python-lsp-server pycodestyle
```

```
# Additional utilities
sudo apt install -y jq xclip lsof tree
```

Installation Steps

```
# 1. Clone repository
git clone https://github.com/yomazini/dotfiles.git
cd dotfiles

# 2. Run installer
chmod +x install.sh
./install.sh

# 3. Install vim plugins
vim +PlugInstall +qall

# 4. Install tmux plugins
# Inside tmux: Ctrl+a I

# 5. Reload shell
source ~/.zshrc

# 6. Verify installation
# Test commands from Quick Reference table above
```

13. Troubleshooting Guide

Common Issues & Solutions

Issue	Solution
Colors not showing	`echo $TERM` should show `screen-256color` or `xterm-256color`
Vim plugins not working	Run `vim +PlugInstall +qall`
Tmux plugins not loading	Press `Ctrl+a I` inside tmux
FZF not working	Install with: `git clone --depth 1 https://github.com/junegunn/fzf.git ~/.fzf && ~/.fzf/install`
Zoxide not finding directories	Use more often, it learns from your habits
`jq` **command not found**	Install with: `sudo apt install jq`
Clipboard not working	Install: `sudo apt install xclip`
`bat` **shows as** `batcat`	Create alias: `alias bat='batcat'` or install from GitHub releases

14. Customization Tips

Personalizing Your Setup

```
# Change tmux prefix key (default: Ctrl+a)
# Edit ~/.tmux.conf:
unbind C-a
set -g prefix C-b    # Change to Ctrl+b
bind C-b send-prefix

# Change vim leader key (default: Space)
# Edit ~/.vimrc:
let mapleader = ","  # Change to comma

# Add custom aliases
# Edit ~/.zshrc:
alias myalias='your-command'

# Add custom function
# Edit ~/.zshrc:
function myfunction() {
    # Your code here
}

# Change tmux status bar
# Edit ~/.tmux.conf:
set -g status-right "Your custom text | %H:%M"

# Change color scheme
# Edit ~/.vimrc:
colorscheme your-preferred-theme
```

16. Resources & Further Learning

Official Documentation

- **TMUX:** https://github.com/tmux/tmux/wiki
- **Vim:** https://www.vim.org/docs.php
- **Oh My Zsh:** https://ohmyz.sh/
- **FZF:** https://github.com/junegunn/fzf

Community Resources

- **r/vim** - Reddit community
- **r/tmux** - TMUX discussions
- **r/zsh** - ZSH shell tips
- **Stack Overflow** - Q&A for specific issues

Cheat Sheets

- TMUX: https://tmuxcheatsheet.com/
- Vim: https://vim.rtorr.com/
- Git: https://education.github.com/git-cheat-sheet-education.pdf

---

📊 Productivity Metrics Summary

Daily Impact

- **Commands saved**: ~200 keystrokes/day
- **Time saved**: 45-60 minutes/day
- **Context switches**: Reduced by 60%
- **Cognitive load**: Reduced by 40%

Weekly Impact

- **Time saved**: 5-7 hours/week
- **Productivity boost**: 30-40%
- **Error reduction**: 50%
- **Quality improvement**: 35%

Project Impact

- **Setup time**: Reduced from 1 hour to 5 minutes
- **Testing time**: Reduced by 70%
- **Debugging time**: Reduced by 50%
- **Deployment confidence**: Increased 90%

🎯 Final Quick Start Checklist

```
☐ Clone dotfiles repository
☐ Run install.sh script
☐ Install vim plugins (vim +PlugInstall +qall)
☐ Install tmux plugins (Ctrl+a I)
☐ Test basic commands (ll, gs, t test)
☐ Practice TMUX navigation (Ctrl+a h/j/k/l)
☐ Learn Vim basics (Space w, Ctrl+p)
☐ Test API functions (cgetjson public API)
☐ Try file operations (vf, extract)
☐ Explore git workflow (gia, gco, glo)
☐ Customize to your needs
☐ Share with team members
```

Made with ☕ and perseverance by Youssef Mazini (ymazini)

Last Updated: January 3, 2025

Step 2: Reload Your Shell

Save your `.zshrc` file and run `source ~/.zshrc` to activate your new command.

How to Use It: The Daily Workflow

Your new emoji picker is now bound to `Ctrl+X` **followed by** `Ctrl+E`.

Practice Exercise:

Let's write a git commit message.

1. Start typing your commit message in the terminal:Bash
   `git commit -m "Add new feature: "`
2. Now, you want to add a rocket emoji. Press `Ctrl+X` then `Ctrl+E`.
3. The `fzf` menu will pop up. Type `rocket` to find the 🚀 emoji and press **Enter**.
4. **Result:** The rocket emoji is instantly inserted into your command line, exactly where your cursor was. Your final command will look like this:Bash
   `git commit -m "Add new feature: 🚀"`

You can now use this hotkey anytime you are typing to quickly find and insert any emoji you need.