

Terminals

New terminal will introduce more diversity into your life



Terminology

Shell is a program that processes commands. Runs foreground and background processes. E.g. *bash*.

Terminal is a program that runs shell.

Shells

sh - Shell

- v.**alpha** RUNCOM program by Louis Pouzin in 1965.
- v.**beta** was Multics shell by Glenda Schroeder in 1965.
- v.**1-6** by Ken Thompson at Bell Labs between 1971 and 1975.
- v.**7** by by Stephen Bourne in 1979.

Shells

csh - C resembled syntax

- Obsolete
- Modified **tc**sh can be found in CentOS

Shells

ksh - Korn Shell



Shells

ksh - Korn Shell

- Job control and Command history were added.
- Is known to be a beginners nightmare.
- A cool achievement within some UNIX groups.

Shells

bash - Bourne again shell

- sh + csh + ksh + new features

Shells

dash - Debian Almquist Shell

- Mostly bash compliant
- Low memory usage and faster execution
- No command history

Shells

fish - Friendly Interactive shell

- Highlights commands syntax
- Autosuggestion based on history
- Autocompletion based on man.
- Mostly bash compliant
- Different (cleaner) syntax for conditionals and loops

Shells

zsh - Z Shell

- v.1 by Paul Falstad in 1990
- zsh derives from the name of professor Zhong Shao
- Mostly bash compliant
- Better command completion
- Better pattern matches
- Awesome Oh-My-Zsh

Shells

Power Shell works with (list of) object(s).

Bash works with text.

Shell load priority



Shell load priority

During system launch

- `/etc/rc*` for UNIX but for MAC:
- `/System/Library/LaunchDaemons/ AND /Library/LaunchDaemons/`

Shell load priority

During terminal --login launch

1. `/etc/profile`
2. `~/.bash_profile`
3. `~/.bash_login`
4. `~/.profile`

When --login terminal is stopped

- `~/.bash_logout`

Shell load priority

When interactive terminal is launched

- `~/.bashrc`

When non interactive and non `--login` terminal is launched

- `none`

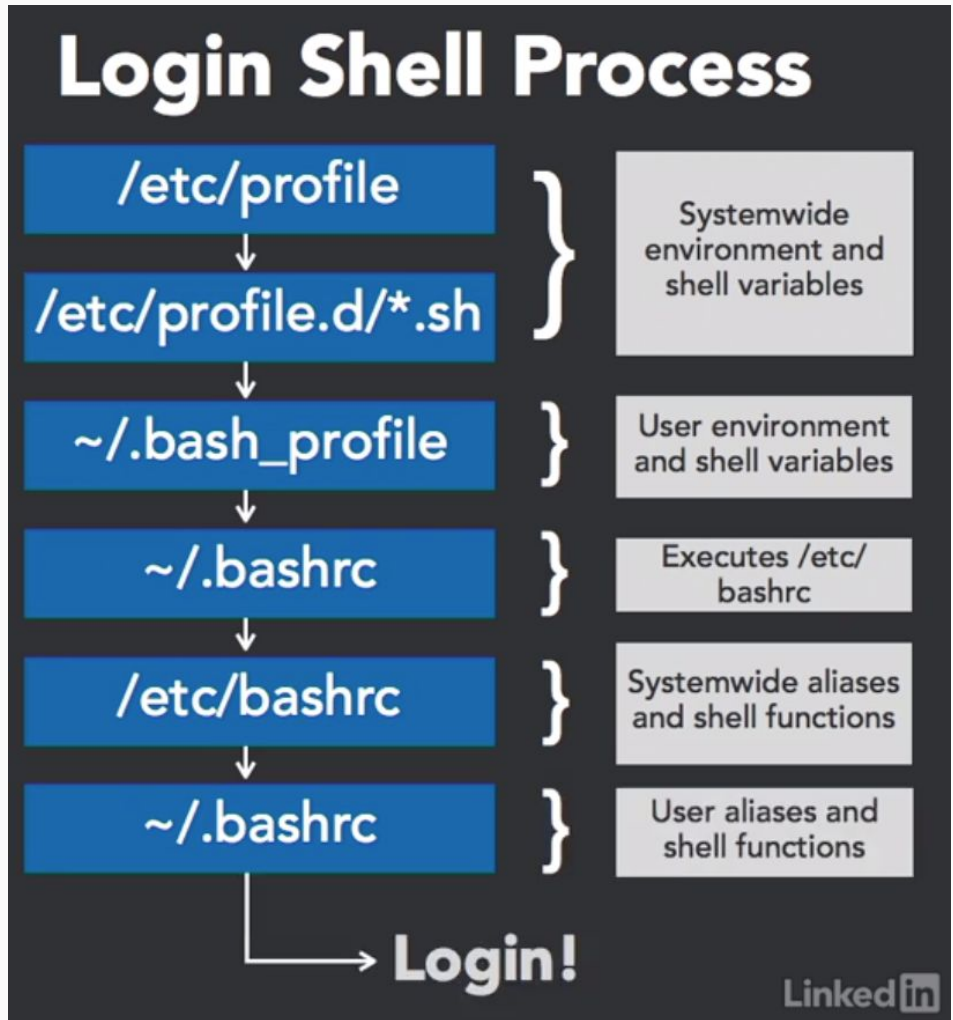
Shell load priority

UNIX launches terminal in interactive mode

BUT MAC launches terminal in --login mode (configurable)

Maybe...

CentOS:



Shell jobs



jobs - run jobs in background

- `ps aux | grep 'dd if'`
- `dd if=/dev/zero of=/dev/null`
- `Ctrl + Z`
- `jobs`
- `bg 1`
- `jobs`
- `fg 1`
- `Ctrl + C`

at/batch - run job later

- at 4:25 am
- at 16:45
- at noon
- at 12:05 tomorrow
- at 4pm + 2 days
- at now + 3 hours
- at now + 5 minutes
- at teatime (4pm)
- at 3:00 5/15/19
- at 10am Jul 31
- batch (low CPU load)

Handle at/batch jobs

- `sudo launchctl load -w /System/Library/LaunchDaemons/com.apple.atrun.plist`
- `at/batch`
- `> Command`
- `Ctrl + D`
- `atq`
- `atrm 1`

crone crontabs - run jobs according to schedule

- **crontab -e**
 - Vim needed commands like:
 - `*/30 * * * * echo "Hey"`
 - `:wq`
- **crontab -l**
- **sudo launchctl load com.<User>.<CronTabName>.plist**
- **sudo launchctl unload com.<User>.<CronTabName>.plist**

Terminals



Installation experience

- Alacritty 👉 git+rust
- Cathode 💔 Not in Ukrainian AppSt
- Cool-retro-term 👉 .dmg / xCode+qt5
- Hyper 👉 .dmg
- iTerm2 👍 brew / .dmg
- Kitty 👉 .dmg / curl...
- MacTerm 👉 .dmg
- Upterm 👍 brew

- Zsh 👉 brew + long setup
- PowerShell Core 👍 brew/.dmg+Installation process

Mac Term

- Ugly:
 - Do **top**
 - Do **CTRL+C**
 - See results
- Build extensions with Python

Cool-retro-term

- Looks retro.
- Looks cool.
- Demo **top** command and show several styles

Hyper

- Electron-based terminal
- Go to <https://hyper.is/>
- Install theme
- Install plugin

iTerm2

- Split functionality (Menu > Shell > Split...)
- Autocomplete (failed)
- Highlighted text is copied automatically
- Paste History (Session > Open Paste History)
- Instant Replay (CMD+OPT+B)
- Tab colors
- And many others...

UpTerm

- Uses Electron+TypeScript+ReactJS
- Beautiful out of the box
- Smart work with some formats (cat example.json)
- Split Screen sessions
- Can show Emoji & Other symbols

Kitty

- GPU based terminal
- Awesome layout:
 - New window CTRL+SHIFT+ENTER
 - Change Layout CTRL+SHIFT+L
 - Resize window CTRL+SHIFT+R (high CPU load)
- Plugins. Especially **diff** ([link](#))
- And many others

Alacritty

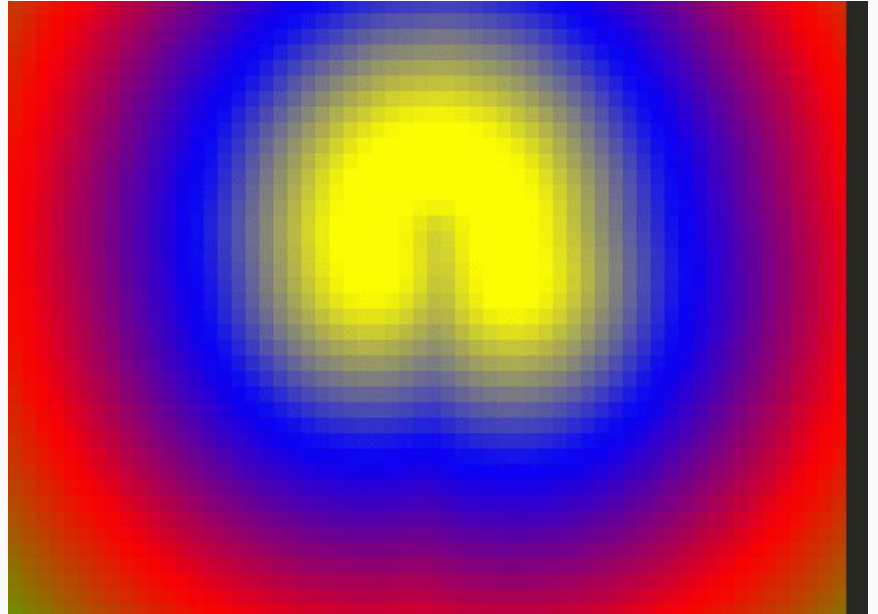
- Uses GPU for rendering and optimizations.
- Claims to be the fastest terminal.

GPU? Huh :)

No Gradient



With Gradient













Terminal test without gradient

Run `./terminal length=200 thickness=0,4,19,0,0`

- Alacritty 🙌 smooth + some layout issues
- Cool-retro-term 🙌 a bit laggy
- Hyper 🙌 smooth + some layout issues
- iTerm2 🙌 a bit laggy
- Kitty 💖 smooth
- MacTerm 👎 laggy
- Upterm 👎 smooth - effects
- Def terminal(PShell) 😓 ugly
- Def terminal(bash) 😓 ugly
- Def terminal(zsh) 😓 ugly

Ternimal test without gradient

```
Run ./ternimal length=20 thickness=70,15,0,1,0 padding=10  
radius=5  
gradient=0.03:#ffff00,0.15:#0000ff,0.3:#ff0000,0.5:#00ff00
```

- Alacritty  smooth
- Cool-retro-term  failed to start
- Hyper  failed to start
- iTerm2  failed to start
- Kitty  failed to start
- MacTerm  ~ 1FPS
- Upterm  white lines + some highlights
- Def terminal(PShell)  smooth+all colors are wrong
- Def terminal(bash)  smooth+all colors are wrong
- Def terminal(zsh)  failed to start

Some customizations



My Terminal customization

1. Fast setup - <http://xta.github.io/HalloweenBash/>
2. More details - https://wiki.archlinux.org/index.php/Bash/Prompt_customization#Bash_escape_sequences
3. iTerm = Command + i

Some productivity commands



curl wttr.in/Odesa | sed -e "s:226m:202m:g"

```
~ curl wttr.in/Odesa
Weather report: Odesa, Ukraine

  \ /      Partly cloudy
- /"".-,  11-13 °C
  \ ( ) . → 22 km/h
 / ( _ )   10 km
           0.0 mm

          Fri 26 Oct
┌──────────┬──────────┬──────────┬──────────┐
│ Morning  │ Noon     │ Evening  │ Night    │
├──────────┴──────────┴──────────┴──────────┤
│  \ /      Partly cloudy │  \ /      Partly cloudy │  \ /      Partly cloudy │  \ /      Partly cloudy │
│ - /"".-,  9-12 °C      │ - /"".-,  11-14 °C      │ - /"".-,  12-13 °C      │ - /"".-,  12-13 °C      │
│  \ ( ) . → 34-44 km/h  │  \ ( ) . → 29-35 km/h  │  \ ( ) . → 19-27 km/h  │  \ ( ) . → 9-13 km/h  │
│ / ( _ )   19 km       │ / ( _ )   20 km       │ / ( _ )   20 km       │ / ( _ )   20 km       │
│           0.0 mm | 0% │           0.0 mm | 0% │           0.0 mm | 0% │           0.0 mm | 0% │
└──────────┴──────────┴──────────┴──────────┘

          Sat 27 Oct
┌──────────┬──────────┬──────────┬──────────┐
│ Morning  │ Noon     │ Evening  │ Night    │
├──────────┴──────────┴──────────┴──────────┤
│  \ /      Partly cloudy │  \ /      Partly cloudy │  \ /      Partly cloudy │  \ /      Partly cloudy │
│ - /"".-,  16 °C        │ - /"".-,  18 °C        │ - /"".-,  17 °C        │ - /"".-,  17 °C        │
│  \ ( ) . → 20-30 km/h  │  \ ( ) . → 23-31 km/h  │  \ ( ) . → 31-48 km/h  │  \ ( ) . → 32-51 km/h  │
│ / ( _ )   20 km       │ / ( _ )   20 km       │ / ( _ )   20 km       │ / ( _ )   20 km       │
│           0.0 mm | 0% │           0.0 mm | 0% │           0.0 mm | 0% │           0.0 mm | 0% │
└──────────┴──────────┴──────────┴──────────┘

          Sun 28 Oct
┌──────────┬──────────┬──────────┬──────────┐
│ Morning  │ Noon     │ Evening  │ Night    │
├──────────┴──────────┴──────────┴──────────┤
│  \ /      Partly cloudy │  \ /      Partly cloudy │  \ /      Partly cloudy │  \ /      Partly cloudy │
│ - /"".-,  17 °C        │ - /"".-,  18 °C        │ - /"".-,  17 °C        │ - /"".-,  17 °C        │
│  \ ( ) . → 23-34 km/h  │  \ ( ) . → 24-33 km/h  │  \ ( ) . → 23-34 km/h  │  \ ( ) . → 23-36 km/h  │
│ / ( _ )   20 km       │ / ( _ )   20 km       │ / ( _ )   20 km       │ / ( _ )   20 km       │
│           0.0 mm | 0% │           0.0 mm | 0% │           0.0 mm | 0% │           0.0 mm | 0% │
└──────────┴──────────┴──────────┴──────────┘
```

Follow [@igor_chubin](#) for wttr.in updates

htop instead of top

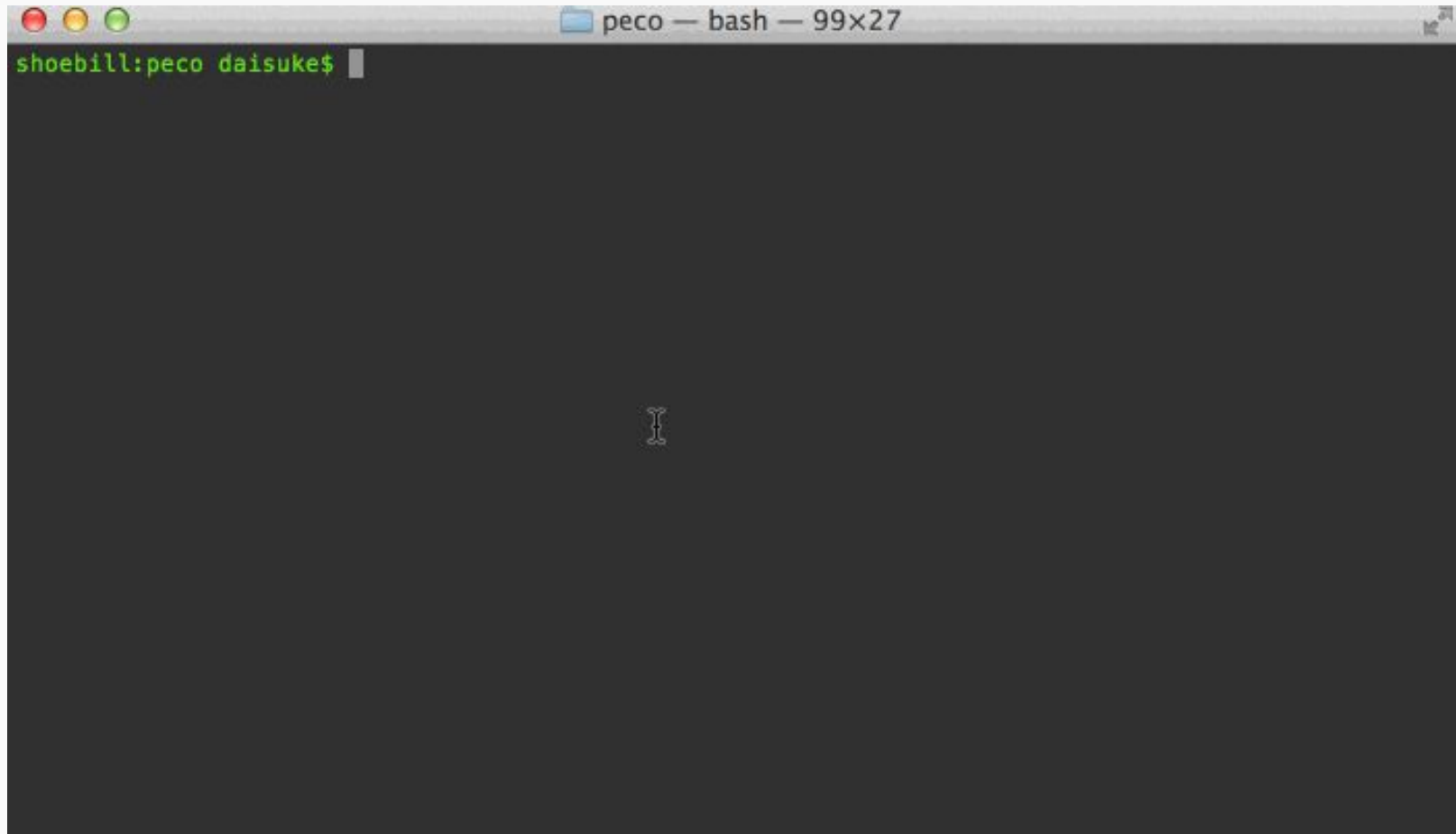
```
bash
Processes: 339 total, 2 running, 337 sleeping, 1673 threads
Load Avg: 1.91, 2.23, 2.07 CPU usage: 14.35% user, 7.78% sys, 77.85% idle
SharedLibs: 198M resident, 49M data, 50M linkedit. MemRegions: 70539 total, 3696M resident, 117M private, 1723M shared.
PhysMem: 11G used (2229M wired), 4941M unused.
VM: 1967G vsize, 627M framework vsize, 1494520(0) swapins, 1572591(0) swapouts.
Networks: packets: 2170341/2905M in, 581508/64M out. Disks: 305695/14G read, 233526/14G written.
16:37:05

PID  COMMAND      %CPU  TIME    #TH   #WQ   #PORT  MEM     PURG    CMPRS  PGRP  PPID  STATE   BOOSTS   %CPU_ME  %CPU_OTHR
5233  htop          0.2   00:00.06  1     0     16    1420K+  0B     0B    5233  5174  sleeping *0[1]   0.00000  0.00000
5232  top           2.4   00:01.36  1/1   0     21    3124K  0B     0B    5232  5117  running *0[1]   0.00000  0.00000
5174  bash          0.0   00:00.05  1     0     16    2428K  0B     0B    5174  5116  sleeping *0[1]   0.00000  0.00000
5117  bash          0.0   00:00.05  1     0     16    2344K  0B     0B    5117  5116  sleeping *0[1]   0.00000  0.00000
5116  kitty         0.5   00:02.53  6     3     211   57M+   3784K  0B    5116  1     sleeping *0[24]  0.00000  0.00000
5077  QuickLookSat 0.0   00:00.28  2     1     54    6324K  0B     0B    5077  1     sleeping  0[1]   0.00000  0.00000
5076  mdworker     0.0   00:00.05  3     1     56    3096K  0B     0B    5076  1     sleeping *0[1]   0.00000  0.00000
5058  quicklookd   0.0   00:00.14  4     1     97    4920K  60K    0B    5058  1     sleeping  0[2]   0.00000  0.00000
4178  Google Chrom 0.0   00:00.11  13    1     90    13M    48K    0B    637   637   sleeping *0[2]   0.00000  0.00000
4177  Google Chrom 0.0   00:02.48  14    1     113   40M    48K    0B    637   637   sleeping *0[4]   0.00000  0.00000

 1 [|||||] 23.3%] Tasks: 338, 1176 thr; 2 running
 2 [||||] 5.4%] Load average: 1.91 2.23 2.07
 3 [|||||] 24.5%] Uptime: 19:43:42
 4 [||||] 4.7%]
Mem[|||||] 9.35G/16.0G]
Swp[|||||] 314M/2.00G]

PID USER PRI NI VIRT RES S CPU% MEM% TIME+ Command
1960 Alex 17 0 972M 223M ? 25.2 1.4 1:19.31 /Applications/Jing.app/Contents/MacOS/Jing
637 Alex 17 0 3414M 324M ? 3.9 2.0 20:44.31 /Applications/Google Chrome.app/Contents/MacOS/Google Chrome
510 Alex 24 0 4665M 13204 ? 2.4 0.1 8:48.46 com.docker.hyperkit -A -u -F vms/0/hyperkit.pid -c 2 -m 2048M -s 0:0
670 Alex 17 0 3347M 346M ? 2.0 2.1 3:14.31 /Applications/Google Chrome.app/Contents/Versions/69.0.3497.100/Goog
5116 Alex 17 0 2662M 108M ? 0.6 0.7 0:02.53 /Applications/kitty.app/Contents/MacOS/kitty
655 Alex 17 0 3315M 356M ? 0.4 2.2 3:13.65 /Applications/Google Chrome.app/Contents/Versions/69.0.3497.100/Goog
1383 Alex 24 0 3304M 260M ? 0.4 1.6 0:39.91 /Applications/Google Chrome.app/Contents/Versions/69.0.3497.100/Goog
675 Alex 17 0 2912M 31476 ? 0.3 0.2 0:49.17 /Applications/Google Chrome.app/Contents/Versions/69.0.3497.100/Goog
308 Alex 17 0 2616M 118M ? 0.3 0.7 0:09.33 /System/Library/CoreServices/Dock.app/Contents/MacOS/Dock
F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice -F8Nice +F9Kill F10Quit
```

peco instead of grep



A terminal window titled "peco — bash — 99x27" with a dark background. The prompt "shoebill:peco daisuke\$" is displayed in green text at the top left. A white cursor is positioned at the end of the prompt. In the center of the terminal, there is a small white icon resembling a vertical bar with a horizontal line through its middle, which is the cursor for the Pico editor.

1. mc [Alex@alexs-MBP-2]:~ (zsh)

Left	File	Command	Options	Right			
< ~				< ~			
[^]				[^]			
.n	Name	Size	Modify time	.n	Name	Size	Modify time
UP--DIR	UP--DIR	Feb 24	2018	UP--DIR	UP--DIR	Feb 24	2018
/.IntelliJIdea15		102	Feb 8 2016	/.IntelliJIdea15		102	Feb 8 2016
/.PyCharm40		102	Oct 31 2015	/.PyCharm40		102	Oct 31 2015
/.Trash		68	Oct 14 16:57	/.Trash		68	Oct 14 16:57
/.android		136	Feb 6 2016	/.android		136	Feb 6 2016
/.atom		510	Mar 21 2018	/.atom		510	Mar 21 2018
/.bash_sessions		2210	Oct 14 16:56	/.bash_sessions		2210	Oct 14 16:56
/.cache		204	Oct 14 20:57	/.cache		204	Oct 14 20:57
/.cargo		170	Oct 8 22:49	/.cargo		170	Oct 8 22:49
/.codeintel		204	Nov 11 2015	/.codeintel		204	Nov 11 2015
/.config		306	Oct 14 20:57	/.config		306	Oct 14 20:57
/.cryptoplugin		102	Feb 2 2018	/.cryptoplugin		102	Feb 2 2018
/.cups		102	Jun 29 2015	/.cups		102	Jun 29 2015
/.dbvis		340	May 2 2016	/.dbvis		340	May 2 2016
/.docker		170	Sep 2 22:44	/.docker		170	Sep 2 22:44
/.dropbox		306	Oct 27 2016	/.dropbox		306	Oct 27 2016
UP--DIR				UP--DIR			
174G/465G (37%)				174G/465G (37%)			

Hint: The homepage of GNU Midnight Commander: <http://www.midnight-commander.org/>

1 Help 2 Menu 3 View 4 Edit 5 Copy 6 RenMov 7 Mkdir 8 Delete 9 PullDn 10 Quit

bat instead of cat

▶ `bat src/index.html`

File `src/index.html`

```
1 <!DOCTYPE html>
2 <html lang="en">
3   <head>
4     <meta charset="utf-8">
5     ~ <title>a changed title</title>
6     <link rel="stylesheet" href="style.css">
7   </head>
8   <body>
9     +   New lines that have been
10    +   added since last commit.
11   </body>
12 </html>
```

imgcat is cat for images



The fuck

```
nvbn@nvbn-desktop: ~/exp/thewfuck 76x18  
→ thefuck git:(master) X █
```

References

1. So many details - <https://terminalsare.sexy/>
2. Ternimal (GPU test) - <https://github.com/p-e-w/ternimal>
3. htop - <https://github.com/hishamhm/htop>
4. The fuck - <https://github.com/nvbn/thefuck>
5. imgcat - <https://github.com/eddieantonio/imgcat>
6. bat - <https://github.com/sharkdp/bat>
7. mc - <https://midnight-commander.org/>
8. Weather - <https://github.com/chubin/wtr.in>
9. Linux Shells and Processes - <https://www.lynda.com/Linux-tutorials/Linux-Shells-Processes/554398-2.html>
10. Bash Guide for beginners - <http://tille.garrels.be/training/bash/index.html>

That's all Folks!