

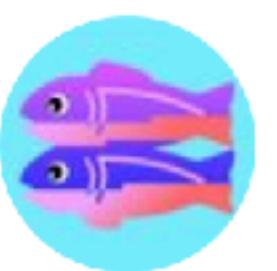
Opening The Black Box

Howdy!
I'm an engineer at
Acquia

Dustin Younse
@milsyobtaf

<https://github.com/milsyobtaf/prez>

What Is Debugging?



Glitch 
@glitch

Follow



My code once took down a client's Intranet mid-demo. Tell us your coding screw-ups, so we can show new coders
#weallmakemistakes 

Glitch 
@glitch

This Junior Dev nuked the prod db on 1st day of new job:
[reddit.com/r/cscareerques...](https://www.reddit.com/r/cscareerques...)

Retweets
330

Likes
617



5:02 AM - 13 Jun 2017

335

330

617



Zach Holman

@holman

Follow



Replying to @glitch

i shipped github to production in development mode, that was neat

Retweets

9

Likes

85



6:46 AM - 13 Jun 2017

2

9

85



jennosaur js



@jennschiffer

Follow



i miiiight have also taken down the china nba site for a few min while switching the nets from nj to brooklyn (long after they moved fyi)

Likes

26



6:24 AM - 13 Jun 2017



1



26



K Cravens
@CakeRavens

Follow



Replying to @glitch

My first client patch caused all their W2's to print with the "deceased" box checked. It was a nunnery. I KILLED AN ENTIRE NUNNERY.

Retweets

30

Likes

155



5:10 AM - 13 Jun 2017



3



30



155



Dustin Younse

@milsyobtaf

Follow



Replying to [@glitch](#)

I took down a university library on the 1st day of the semester with a botched FTP transfer of .htaccess. Better than Finals Week I suppose.

10:21 AM - 14 Jun 2017



What Is Debugging?

Nothing But Text?

The screenshot shows a web browser window for the Acquia website (<https://www.acquia.com>). The page features a yellow header bar with the Acquia logo and navigation links. Below the header is a main content area containing a search form and a sidebar with various links.

Header:

- CMS Platform for Content, Con x
- Secure | https://www.acquia.com

Main Content Area:

- Skip to main content
- Contact Us
- Login**
-
- I want to...
 - Products
 - Request a Demo
 - Try Acquia Cloud Free
 - Buy Acquia Cloud Professional
 - Contact Sales
 - Support
 - Open a Ticket
 - Contact Support
 - Learning & Events
 - Register for a Webinar
 - Register for Acquia Certification Exam
 - Find Acquia Academy courses
 - Partners
 - Find a Partner
 - Become a Partner
 - Register a Deal
 - Get Trained
 - Support
 - Developers

Footer:

- 888-922-7842
- United States

Search Form:

Search Search

Nothing But Text?

- CSS aggregated but not cached
- JS blocked in the browser
- File permissions in sites/default/files

Debugging vs Troubleshooting

- Mostly a semantic difference
- 5 minutes vs 5 hours?
- “Fixed” vs understood and corrected

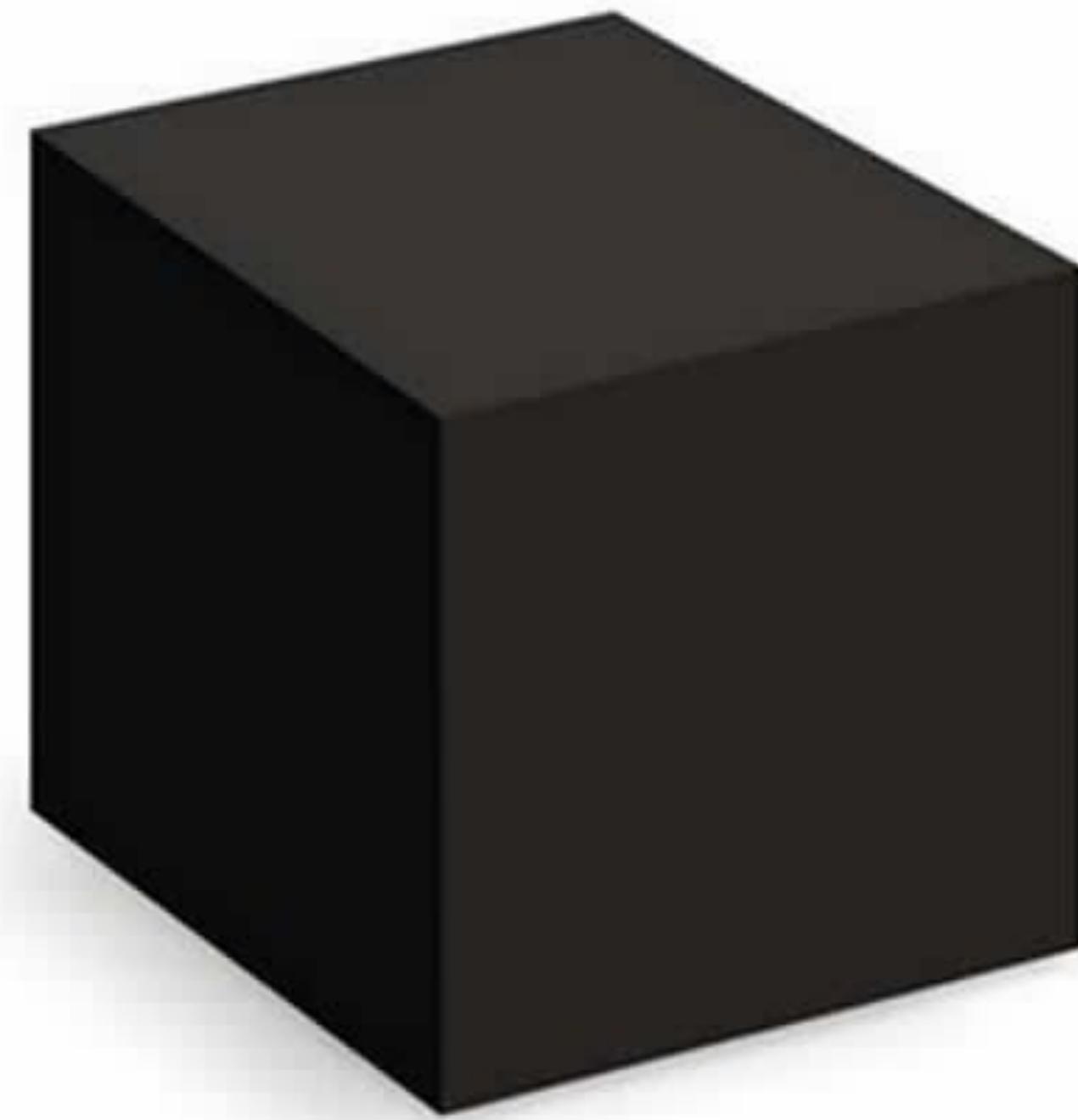
What Is The Black Box?

A Familiar Story?

- Non-technical education
- Self taught web skills
- Above average Googling abilities
- Long days and late nights staring at error message

What Is Drupal?

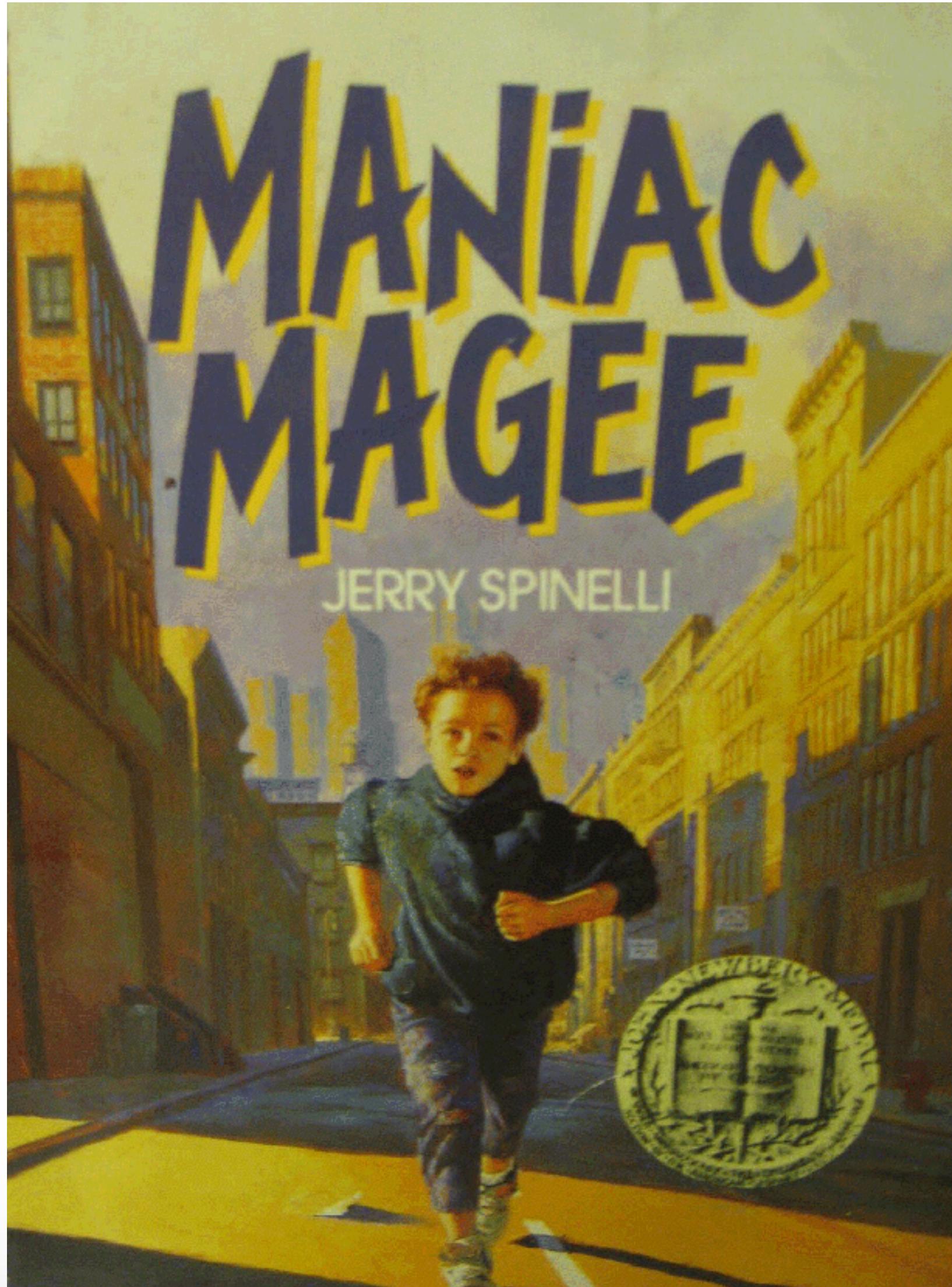
Mental Model of Drupal



Mental Model of Drupal



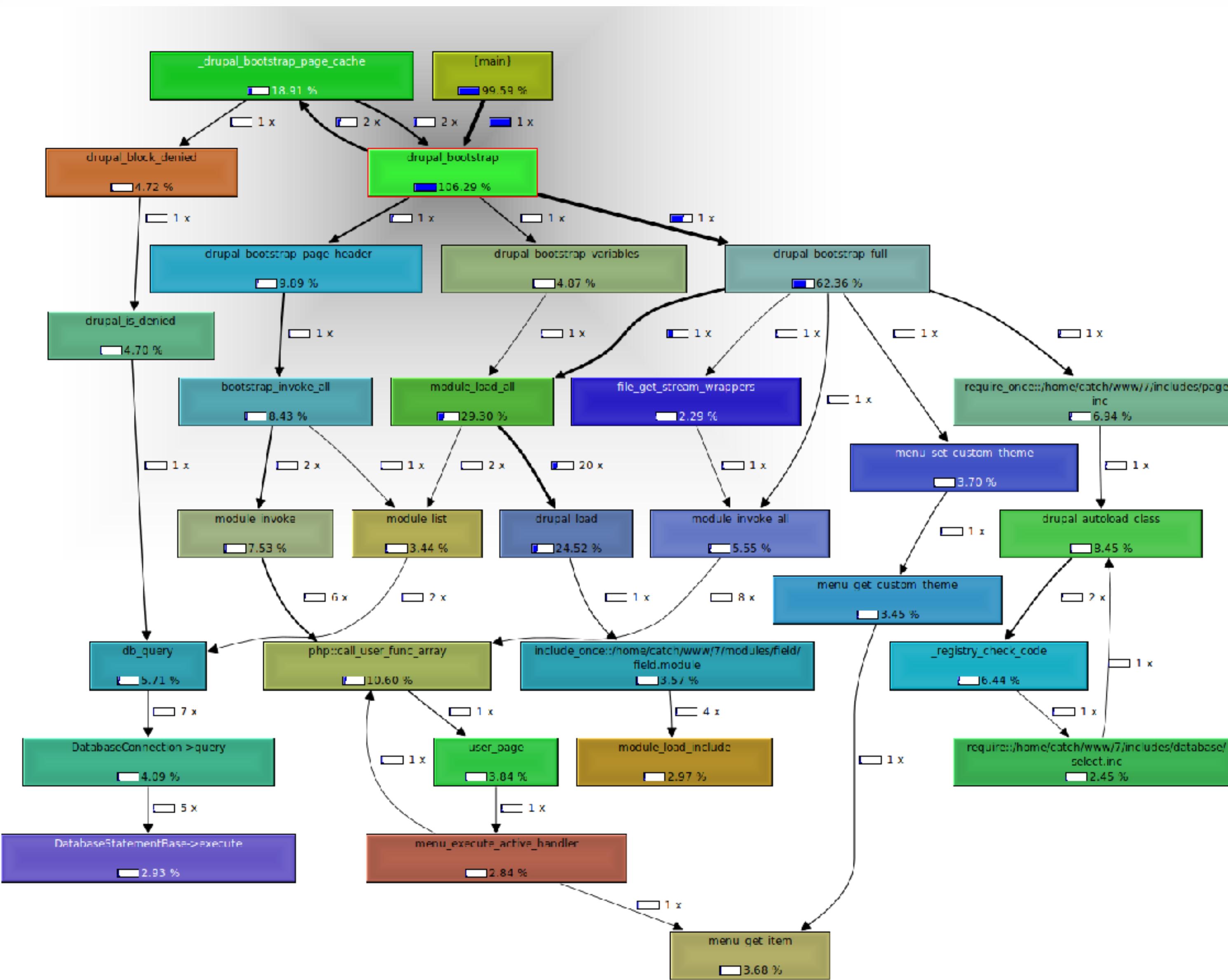
Mental Model of Drupal



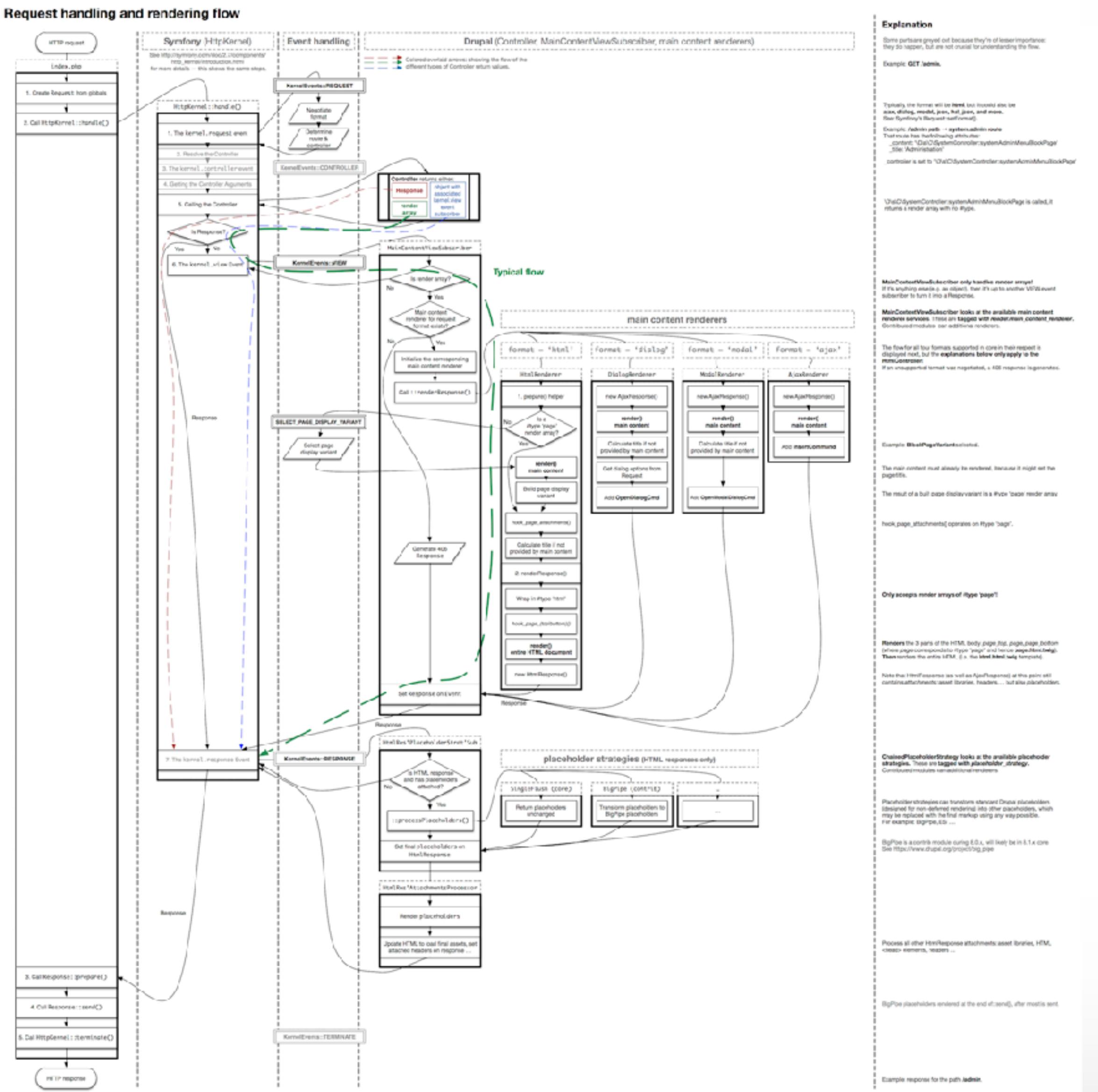
Mental Model of Drupal



Mental Model of Drupal



Mental Model of Drupal



Start At The Beginning

When All You Have Is A Hammer



CC by 2.0 <https://www.flickr.com/photos/raindrift/7095238893/>

Text Editors

- “Text Editors”
- Text Editors
- IDEs

“Text Editors”

- Notepad (Windows)
- Text Edit (Mac)
- Nano (Linux / Mac)

Text Editors

- Notepad++ (Windows)
- Dreamweaver (Mac / Windows)
- Sublime Text (Mac / Linux / Windows)
- Atom (Mac / Linux / Windows)
- Microsoft VS Code (Mac / Linux / Windows)
- vim (Mac / Linux)

Integrated Development Environments

- PHPStorm (Mac / Linux / Windows)
- Eclipse (Mac / Linux / Windows)
- Komodo (Mac / Linux / Windows)

Operating Systems With Built In Text Editors

- emacs (Mac / Linux / Unix / Everything else)

Development Environments

- On your server
- On your machine
- On your machine, but it acts like the server

Development Environments

- FTP Development
 - “Cowboy coding”
- Local Environments
 - MAMP / LAMP
- Next generation
 - Vagrant / Docker

FTP Development

- FTP Development
 - “Cowboy coding”
 - No version control up front
 - Little debugging visibility
 - Log files (maybe), debug statements
 - Watchdog logs (maybe)

Debug Statements in Code

- print_r()
 - Raw dump of a variable or context, no formatting
 - print_r(\$node);
 - <pre><?php print_r(\$node); ?></pre>
- dsm() / kint()
 - Formatted dump of a variable or context
 - dsm(\$node);

Local Development

- MAMP / Dev Desktop / Native LAMP
 - Code runs entirely locally
 - Added bonus of offline work, no internet required
- print_r(), dsm(), kint(), but also more
- xdebug

Local Development: The Next Generation

- Kalabox / Lando for Acquia / Pantheon / Platform.sh
- DrupalVM / Homestead and other Vagrant boxes
- print_r(), dsm(), kint(), xdebug
- Very accurate performance profiling
 - XHProf
 - Blackfire
 - Tidewater

What's xdebug?

xdebug: Step Through Debugging

- Hitting pause on code execution
- Inspect the current state of “the stack”
- Modify values *live*

xdebug: Step Through Debugging

Something Is Broken!



Relax.



DHH

@dhh

Unless you're making software for rockets, self-driving cars, or pacemakers, ease off on the "mission critical" bullshit, yeah?

RETWEETS

353

LIKES

968



7:22 AM - 15 Feb 2017

50

353

968

Relax.

Remember Cobble's Knot



What's Broken?

- Is something not showing up?
 - New content - is it published?
 - Old content - are permissions set properly?
- Is something showing up that shouldn't?
 - Raw HTML and Javascript in a WYSIWYG field?

Work From The Bottom Up

- Log Files
 - You should learn how to find your log files **before** you need your log files
- multitail
 - Linux / Mac utility to easily view logs with more options than tail

Where Is It Broken?

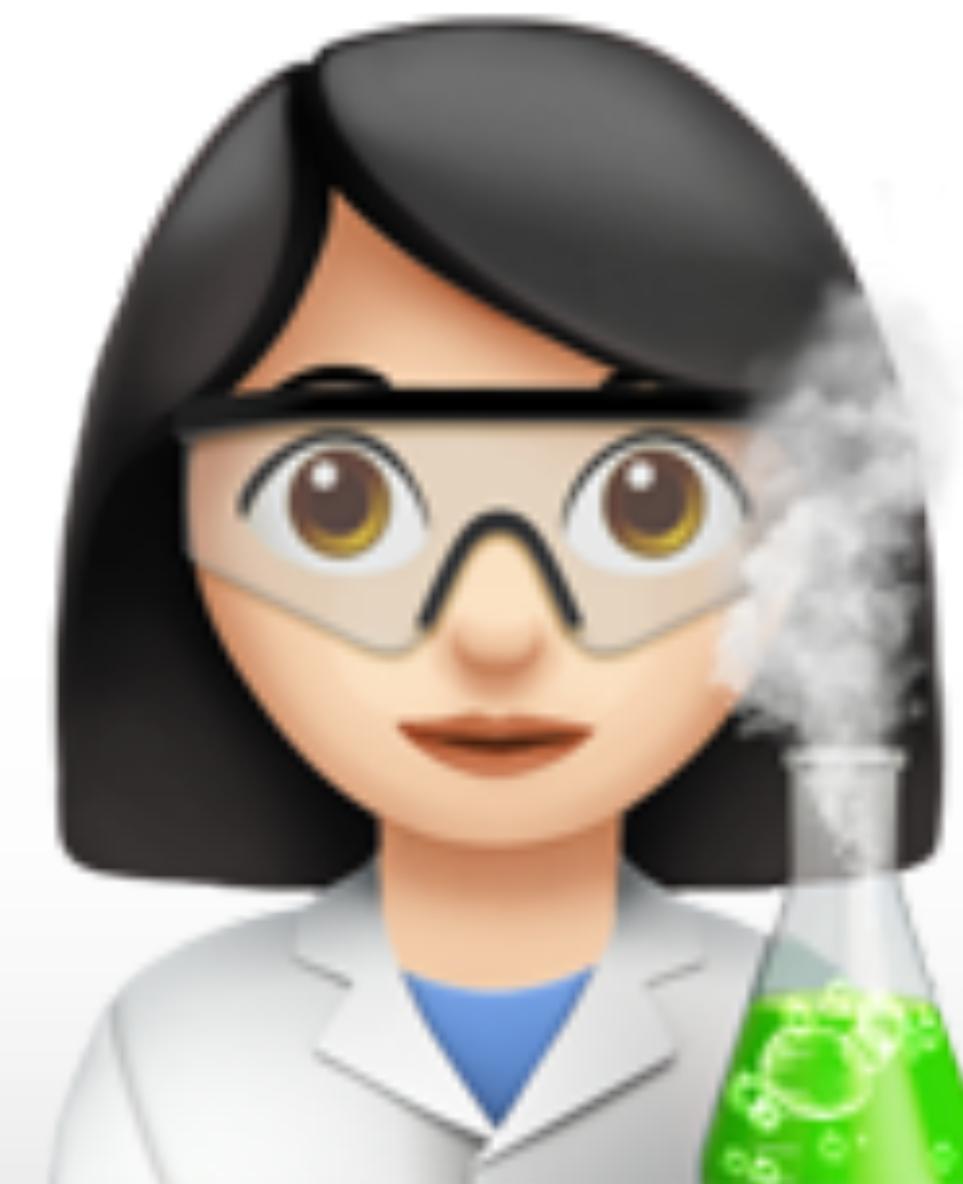
- Custom Module
- template.php / .theme file
- Theme Template



The Scientific Method

Finally, Debugging

- Change **one** thing at a time
- Test that change
- Repeat



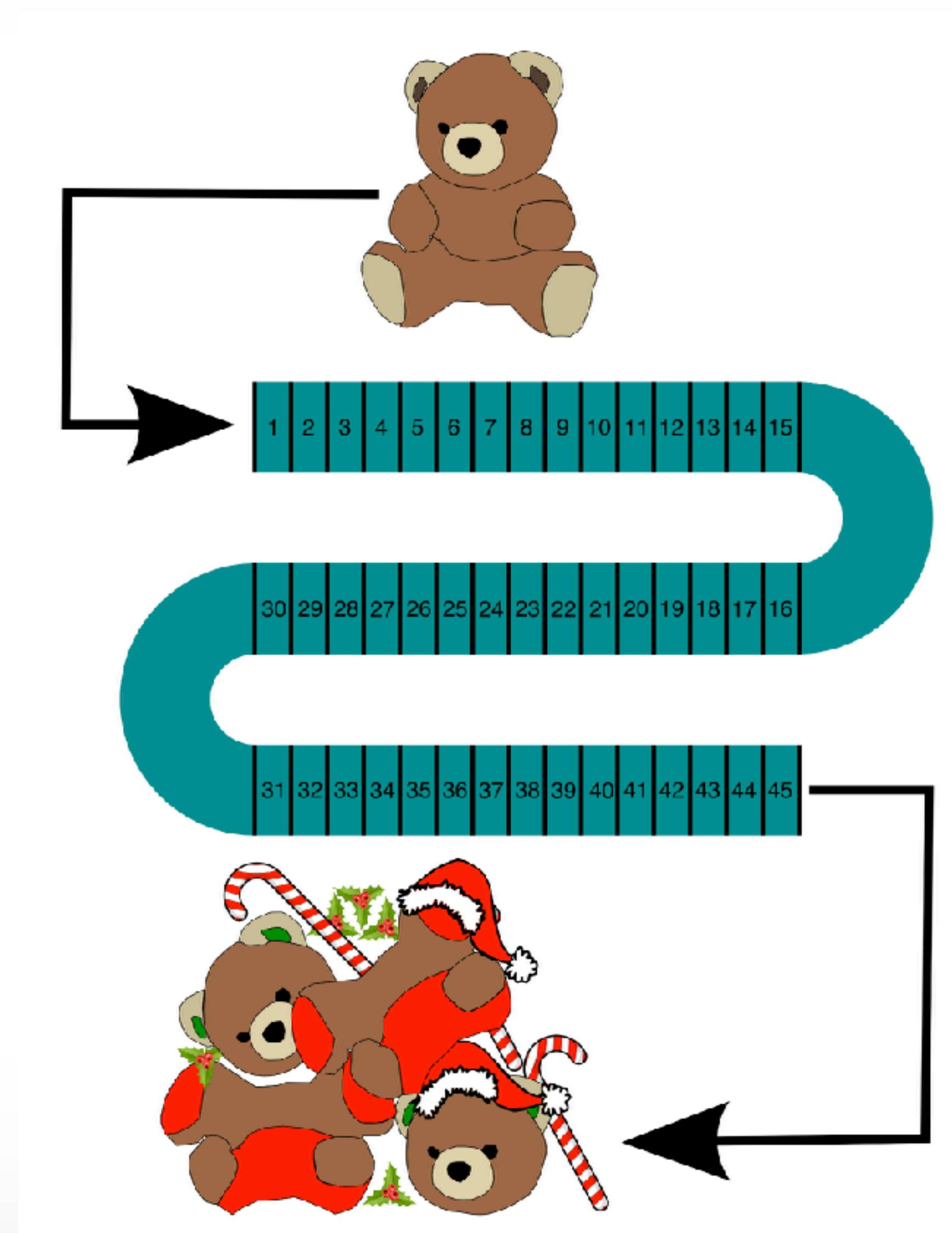
git Is Your Friend

- Save your progress as you work
 - Recreate your Features or config yml
 - Makes rabbit holes manageable

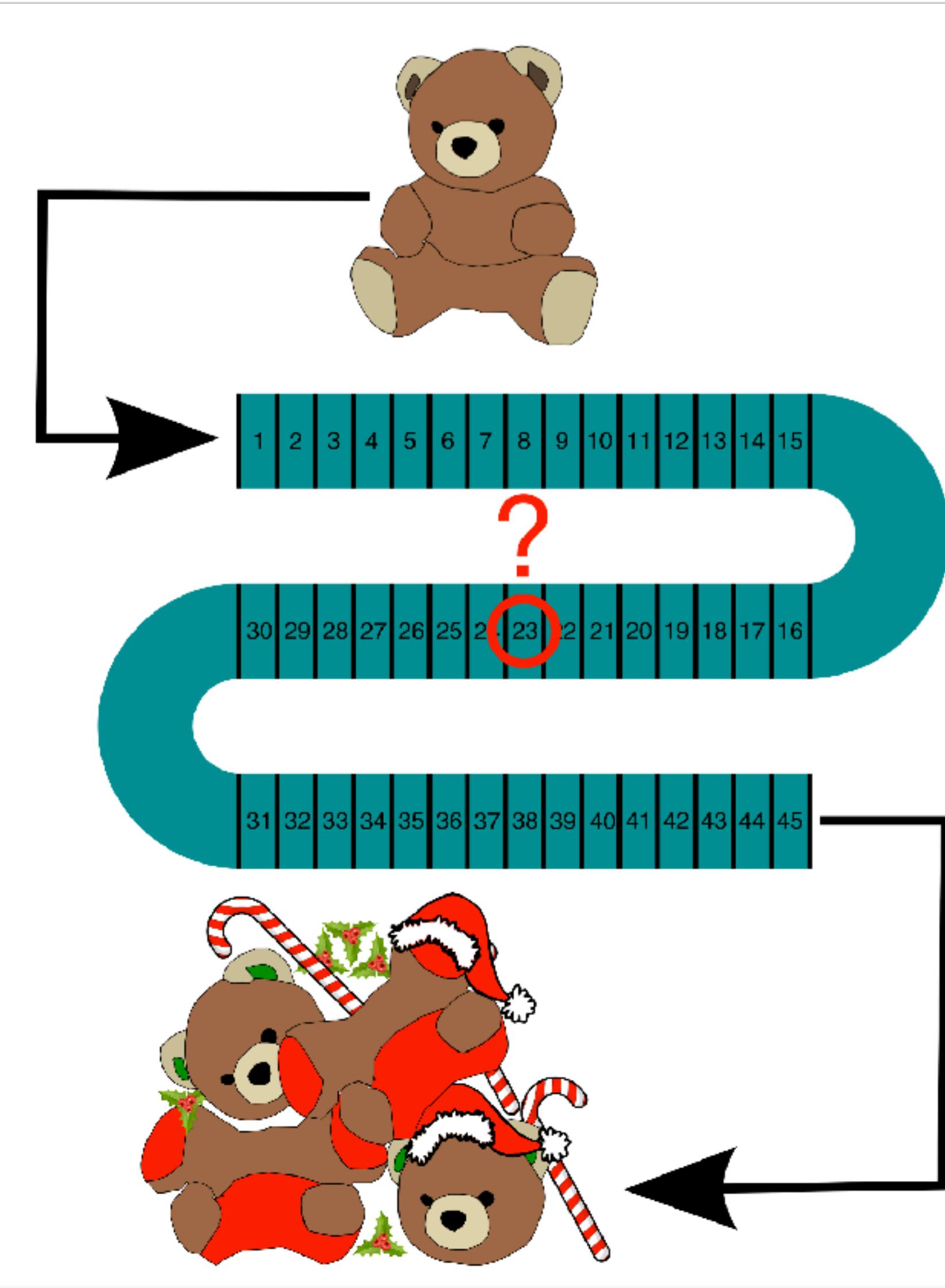
git bisect Is Your Friend

- Let's you isolate changes between commits

git bisect Is Your Friend



git bisect Is Your Friend



git diff Is Your Friend

- Remove your debug statements
- Ensure you only changed **as much** as you needed to change
- You only push **print_r('Ughhhhhh');** to master **once**

git blame Finds Your Enemies

git blame Finds Your Enemies

git blame Is Your Friend

git annotate Is Your Friend

- Can help you track down who wrote the offending code
 - This **should not** be a witch hunt
 - This **should** be a chance to find context for the issue

[Code](#)[Pull requests 0](#)[Insights](#)[drupal / index.php](#)[100644](#)

23 lines (16 sloc)

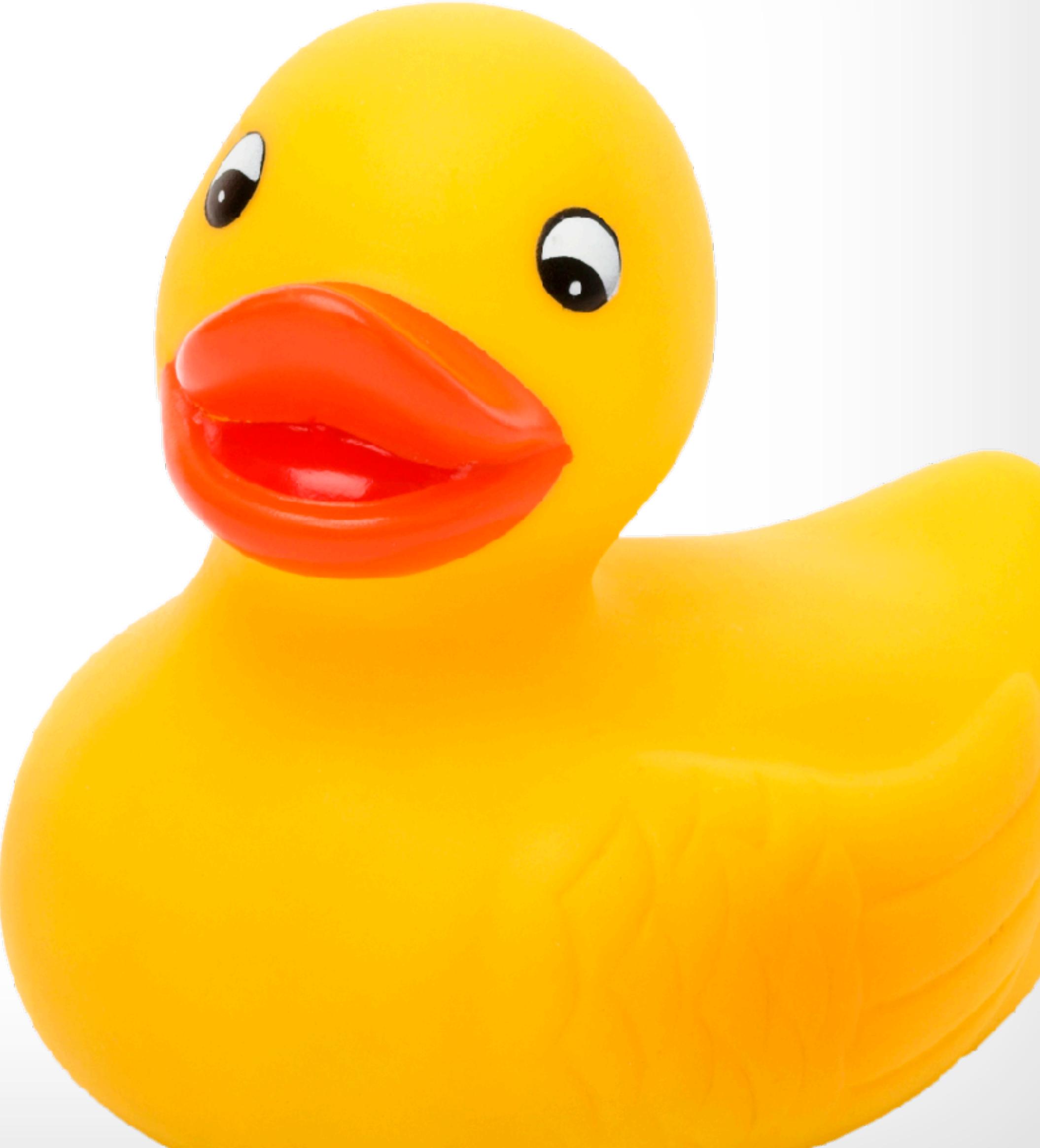
549 Bytes

| | | | | | |
|--|--|--------------|--|----|-------|
| | - applied David Norman's patch to turn all <?'s into fully qual... | 17 years ago | | 1 | <?php |
| | Imported sources | 18 years ago | | 2 | |
| | - Patch by JonBob: for consistency and readability, add brief ... | 14 years ago | | 3 | /** |
| | | | | 4 | * @fi |
| | | | | 5 | * The |
| | | | | 6 | * |
| | - Patch #174226 by keith.smith, pwolanin et al al -- and grea... | 10 years ago | | 7 | * All |
| | Issue #22336 by quicksketch, scor, boombatower, and rfay. M... | 7 years ago | | 8 | * See |
| | - Patch by JonBob: for consistency and readability, add brief ... | 14 years ago | | 9 | */ |
| | | | | 10 | |

Other Debugging Methods

Debugging Techniques

- Walk away. Seriously.
- Talk to a coworker.
- Talk to a rubber duck.
- Write it down. By hand.



Make The Future Easier

Proactive Debugging

- watchdog() (D7)
- \Drupal::logger() (D8)
- Monolog
- syslog Module
 - <https://www.elastic.co/blog/heya-elastic-stack-and-x-pack>
 - <https://loggly.com>
 - <https://www.sumologic.com>
- Write a test!
 - Simpletest / PHPUnit / Behat

- **The Art of Troubleshooting** by Jason Maxham
 - <https://artoftroubleshooting.com/book/>
- **Debugging: The 9 Indispensable Rules for Finding Even the Most Elusive Software and Hardware Problems** by David Agans
 - <http://debuggingrules.com>
- **Debugging During Development in Drupal 8** by Allie Jones
 - <https://www.gitbook.com/book/zivtech/debug-tools-for-drupal8/>
- **Using the PhpStorm Debugger** by JetBrains
 - https://confluence.jetbrains.com/x/_idqAw
- **Maniac Magee** by Jerry Spinelli
 - <https://www.worldcat.org/oclc/20422223>

**Further
Reading**

**Thanks!
Questions?
War stories?**

@milsyobtaf

<https://github.com/milsyobtaf/prez>