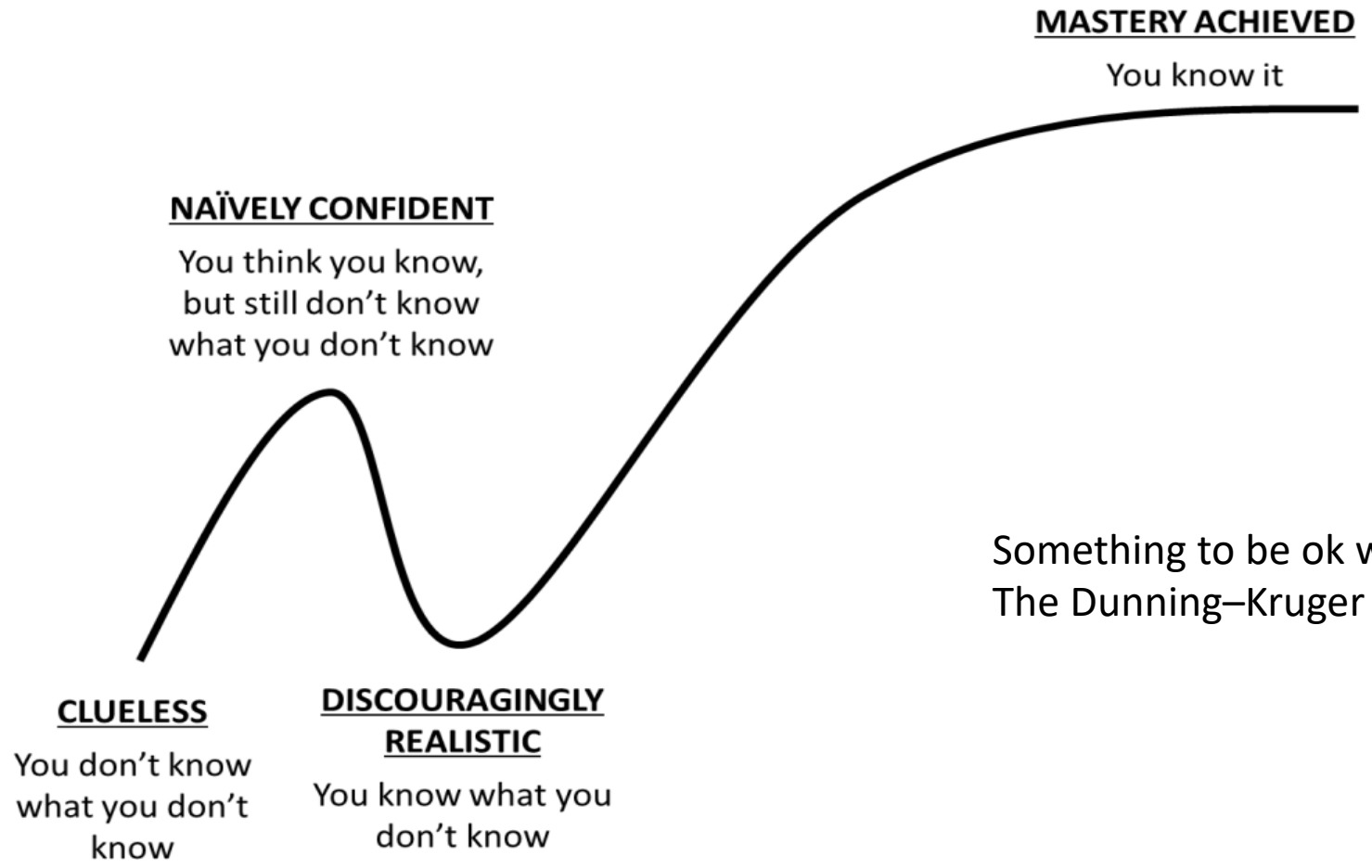
Making a Software Engineer

Lecture 2

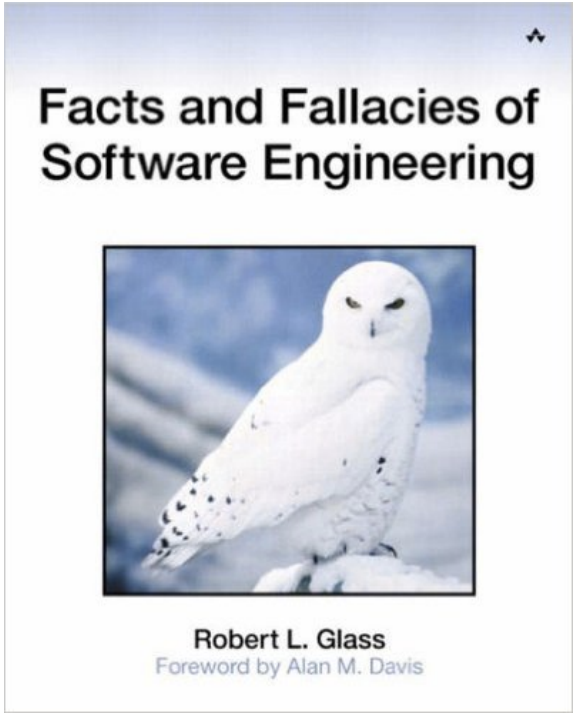
Today's Agenda

- Last Time in CSE 112 Explained
- Logistical announcements
  - Participation Approaches
- Reviewing the Homework
  - Why did we do such a homework?
    - 3 hands for answers please
- The Lecture
  - Slide Time!
  - But first some questions…

Where are you?



Something to be ok with –
The Dunning–Kruger effect

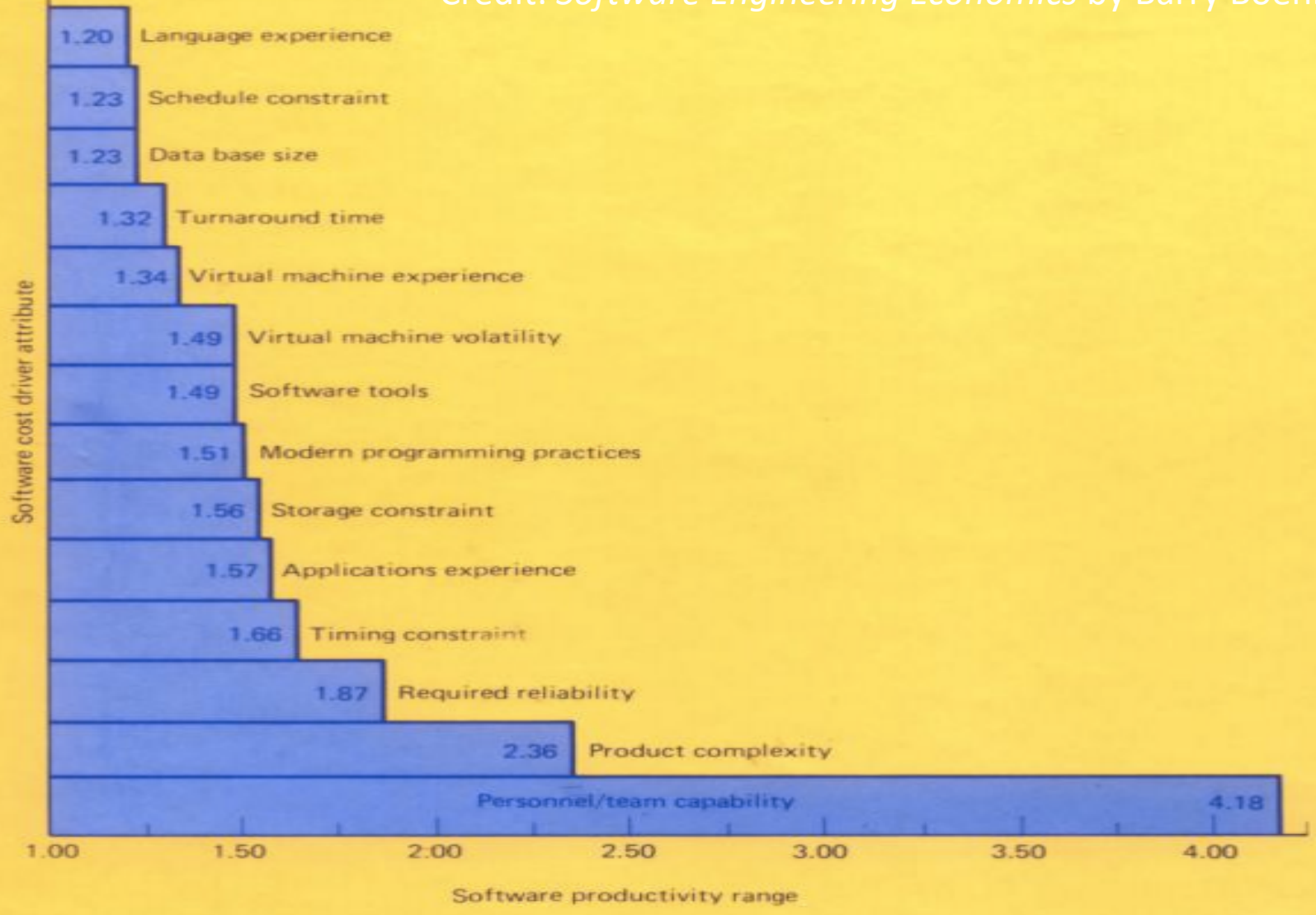


Fact #1

The most important factor in improving software development is not the tools and techniques used by programmers, but the quality of the programmers themselves


NO MATTER WHAT THE PROBLEM IS
IT'S ALWAYS A PEOPLE PROBLEM

Credit: *Software Engineering Economics* by Barry Boehm



Example #2: 10X Programmers

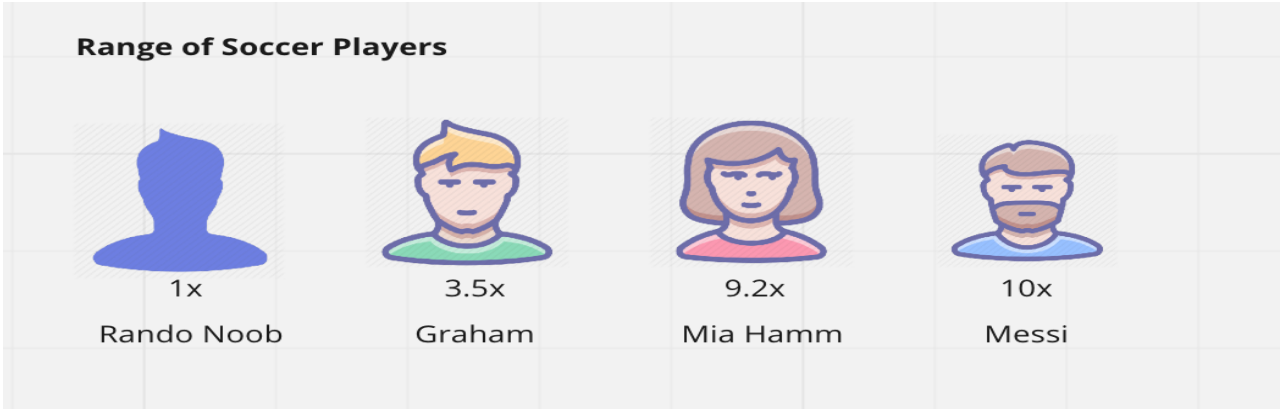
"…researchers have found 10-fold differences in productivity and quality between different programmers with the same levels of experience"

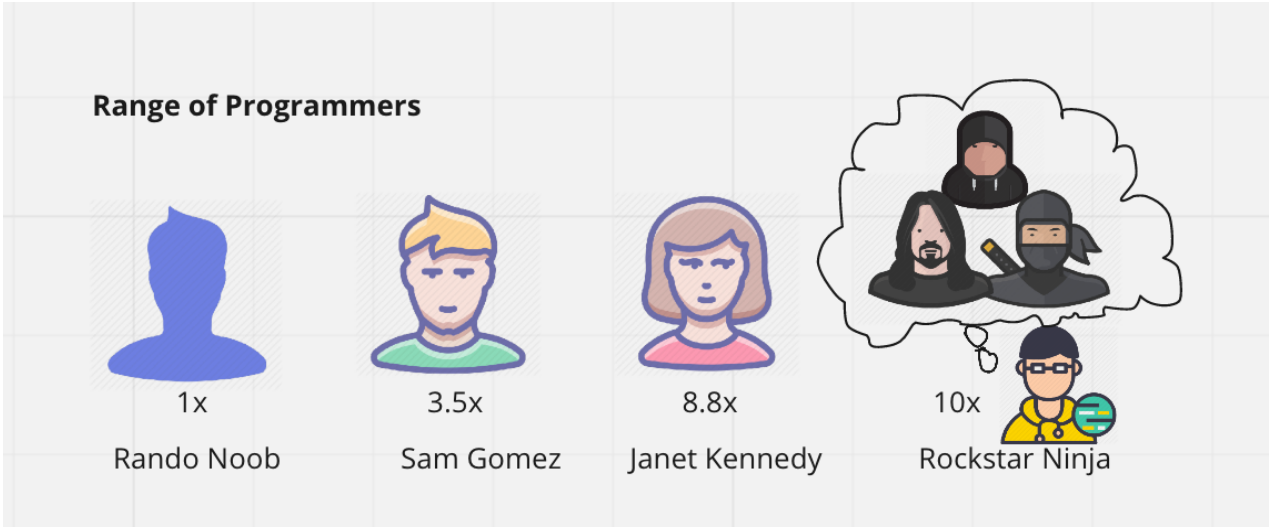
http://www.construx.com/10x_Software_Development/Productivity_Variations_Among_Software_Developers_and_Teams__The_Origin_of_10x/

The romantic image of an über-programmer is someone who fires up Emacs, types like a machine gun, and delivers a flawless final product from scratch. A more accurate image would be someone who stares quietly into space for a few minutes and then says "Hmm. I think I've seen something like this before."

http://www.johndcook.com/blog/2009/12/23/why-programmers-are-not-paid-in-proportion-to-their-productivity/

Of Course “10x” Exists





2x, 10x or 28x?

- Best programmers are X times better than average/worst programmers what X is
  - X generally isn't small per the experts it seems to range from 2, 10, to 28x or more depending on the pundit's degree of hyperbole.
  - Let's just agree it is better to have better programmers
  - TAP: "I rather have a coding SEAL team than 50 'hacks' in nearly every situation"
    - What about a brute force job?
    - Think about how the coding SEAL would address this?
      - "Code generator, etc."

Why fight Fact #1?

- We embrace the fallacy because what we do is hard as it is and we want it easier
  - Tools and languages are predictable, people often **seem** arbitrary and thus are much harder
- Idea: People are not computers with emotions, but instead are emotional beings who try to be logical or rational.

Fact #5 Supports Fact #1

Software tool and technique improvements account for at most 5-35% percent increase in productivity or quality, not the order of magnitude benefits promised

- Careful: Hypesters tend to have underlying reasons for the hype
  - Consulting, books, $ attraction (VC), naiveté and wishful thinking
  - Sometimes it is a hyperbolic means to an end
    - Common marketing approach to fixing a market is to make a new market
    - Can't beat the competition or already lost to them
      - Rename/rebrand existing idea and claim it is all new
- We like to believe the fantasy and we wish it were true
    - Less work more gain! 6 min abs, how about 3 min abs

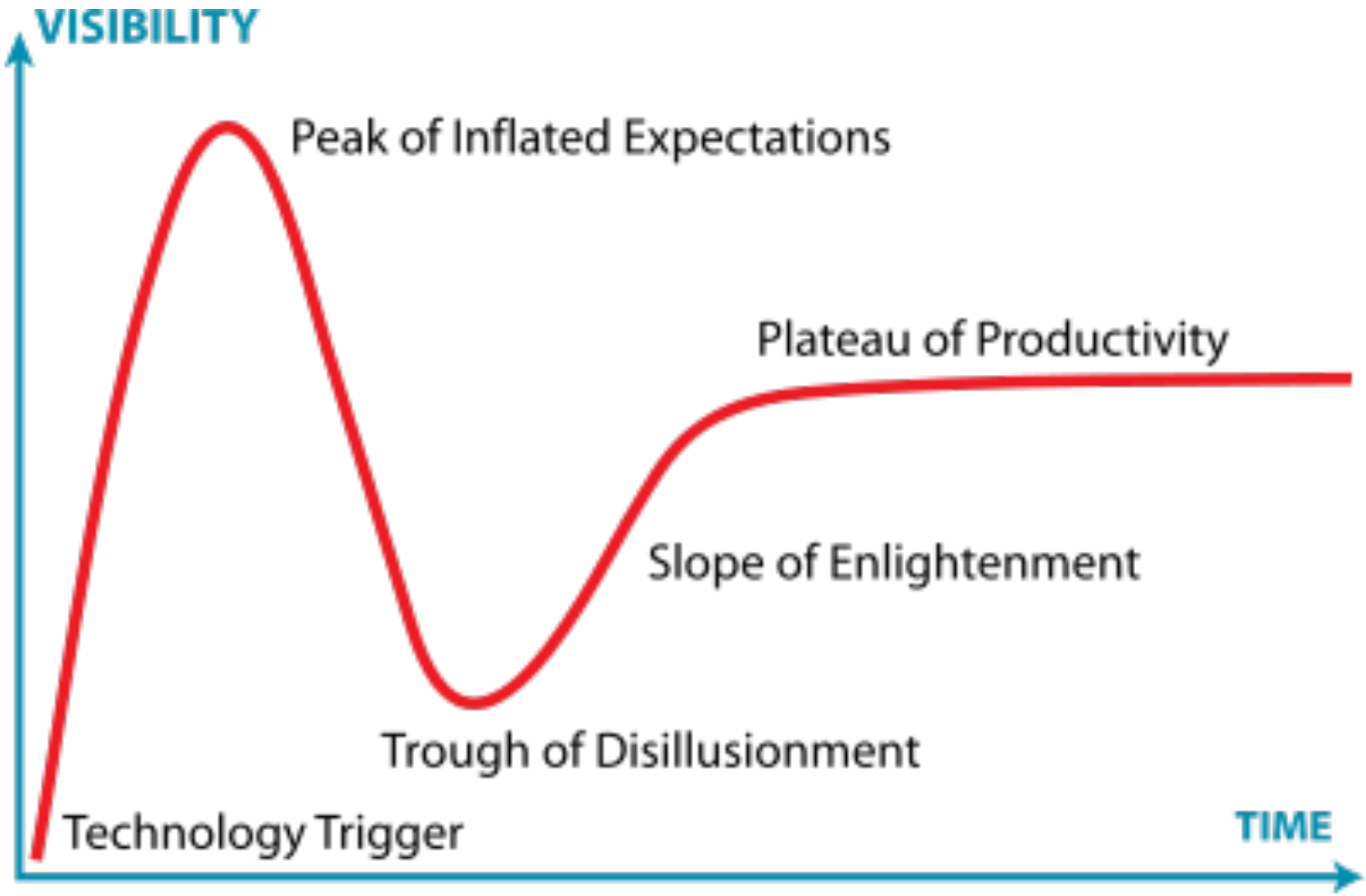
Fact #6 isn't acknowledged enough

Learning a new tool, language, library, technique, etc. actually lowers productivity and quality initially. The gains come only later

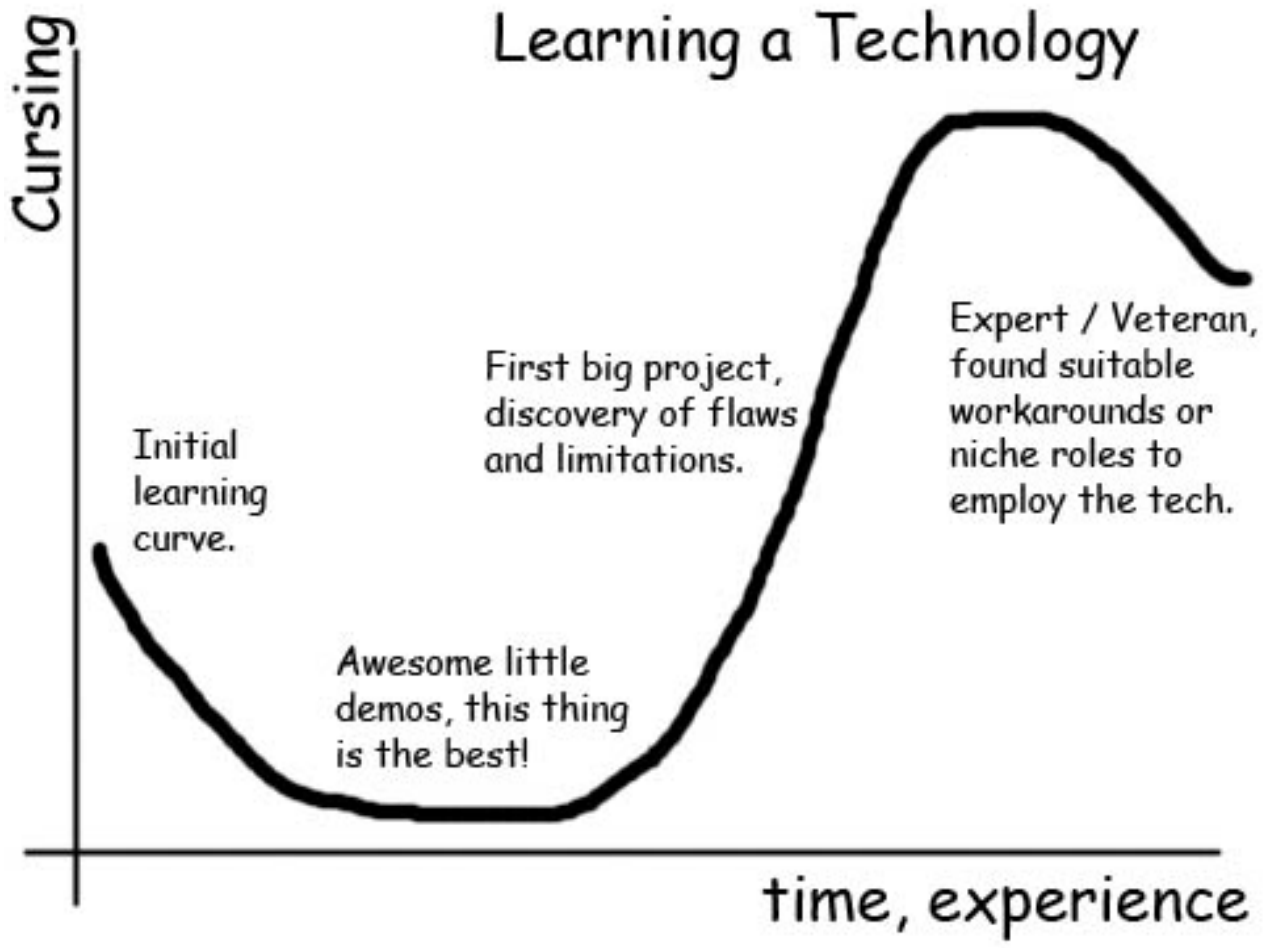
My Related Fact: There is always another tool! Because of this fact it is easy to always be chasing the next best thing!

- We talk a lot about tools, evaluate lots (usually too few), adopt/buy a number of them, initial use some, and very rarely adopt many long term!

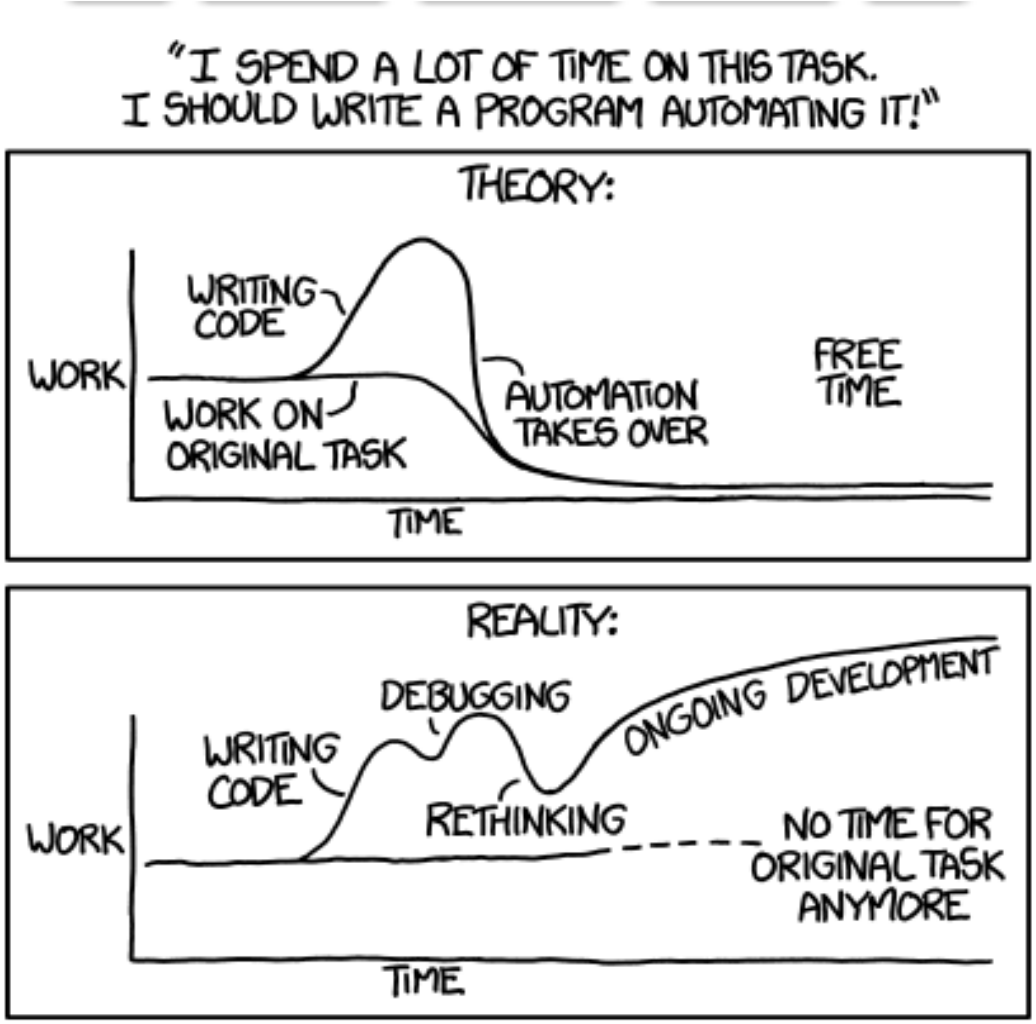
From the "Joke" Part of Lecture 1



A "Joke" for Lecture 2



Sadly None of this is a Joke

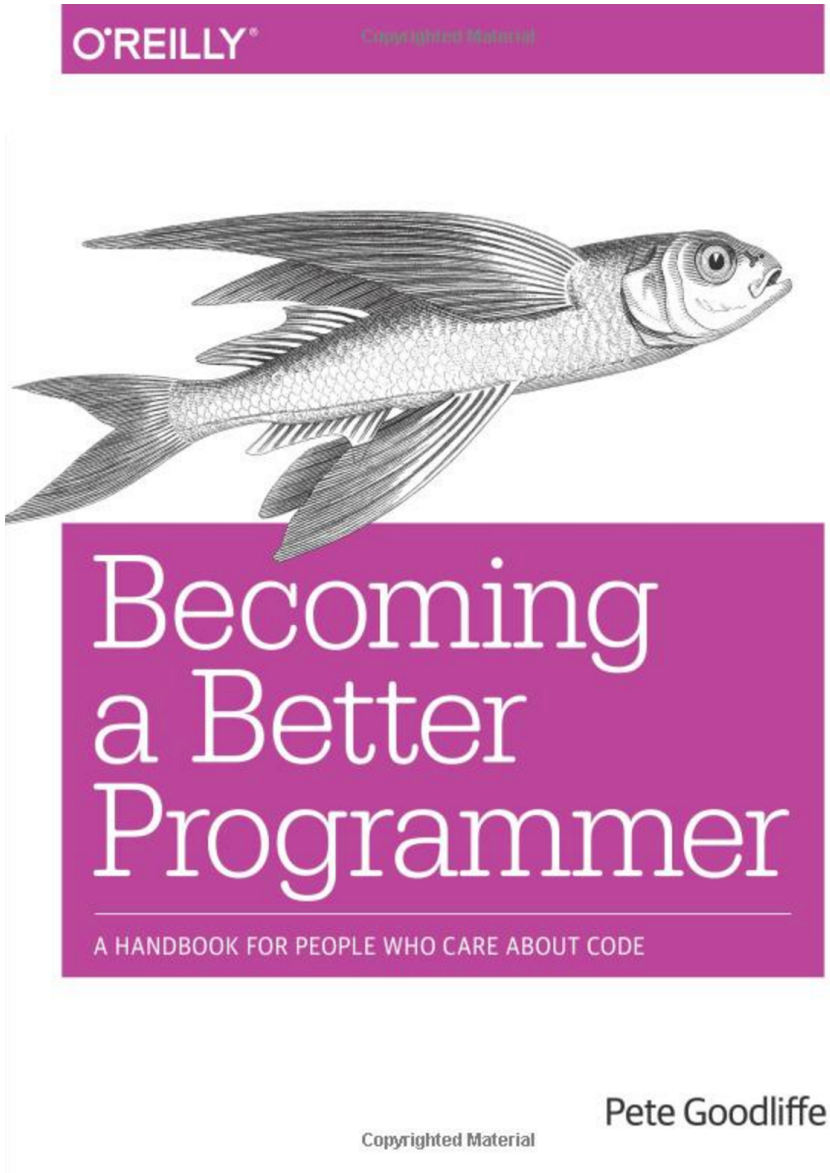


Programmer Master Thyself

- "When all is said and done, the ultimate factor in software productivity is the capability of the individual practitioner"
  - If this is true, then our goal is to make the individual practitioners better right!?
- Unfortunately: It is quite difficult to ~~control~~ influence the improvement others
- We have a fighting chance with ourselves so we should start there!

pro•gram•mer

n. [proh-gram-er]
an organism that
turns caffeine and
pizza into software


O'REILLY
Copyrighted Material
Becoming a Better Programmer
A HANDBOOK FOR PEOPLE WHO CARE ABOUT CODE
Pete Goodliffe
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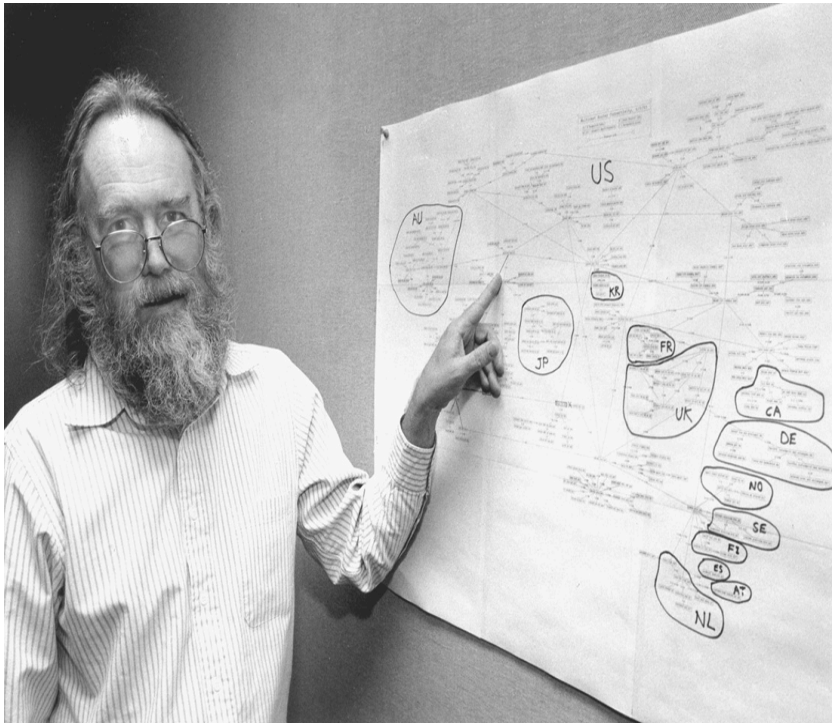
Postel's Law for Yourself

- Robustness principle
  - "*Be conservative in what you do, be liberal in what you accept from others* (often reworded as "Be conservative in what you send, be liberal in what you accept").
- Roughly applied to our effort you can control what you do and shouldn't contribute to the "mess" but need to be flexible with what others do since they might give you "mess"
- This seems to be a golden rule far beyond computing!



Attitude First

- You must **want** to be a better programmer
- It will take time and effort to become a better programmer
- Like any thing, to do good X you have to care about X
  - To write good code you have to care about it.
  - So being emotional about code is indeed valid
  - Disgust and pride are reasonable reactions to code
  - However, player != game, do not make YOU === CODE mistake

Q: How to make a better programmer?
A: Practice!

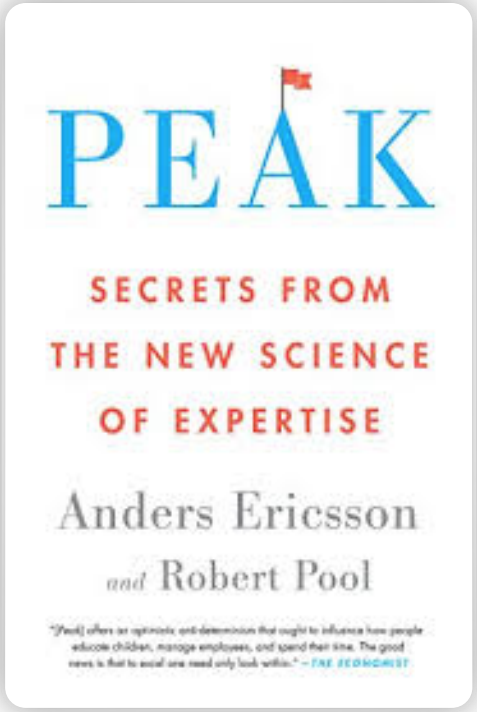
- The adage practice makes perfect is clearly not a programming specific idea
  - Example: I want to play the guitar
  - Requirement: Lots of time, need to practice, play chords, play songs badly many times, etc.

- If applied to the act of creating ideas like coding it suggests you need to write lots of bad code before you can write a little great code
  - Long held in writing - the “shitty first draft”
  - Don’t forget the rewrite (or in our case refactor!)

- 10,000 hours then!?
  - http://www.wisdomgroup.com/blog/10000-hours-of-practice/
- Or not
  - http://www.businessinsider.com/new-study-destroys-malcolm-gladwells-10000-rule-2014-7

The Need for Practice

- ‘Generally once a person reaches that level of “acceptable” performance and automaticity, the additional years of “practice” don’t lead to improvement. If anything … abilities generally deteriorate in the absence of deliberate efforts to improve
  - Think Driving
  - Rick O has an opinion on this!



Not any kind of practice

- Purposeful practice which has well-defined, specific goals

- 3Fs Required
  1. **F**ocus
  2. **F**eedback - positive focused feedback
  3. **F**ailure – just beyond one's comfort zone

- It won't be easy. You'll hit plateaus. And guess what there may be no limits?

Train the Brain?

- We all believe in some sense that you can improve the body, be it diet, lifting weights, etc. What about the brain?
  - Of course! In fact we can see in studies of brains of those undergoing long term training changes in brain structures which appear to be relevant or related to the skill being developed
- By design the human body is tuned to achieve homeostasis
- But you can adjust what that homeostasis is and the body will regain homeostasis over time

Memory Athlete!

https://well.blogs.nytimes.com/2014/05/19/remembering-as-an-extreme-sport/

To Optimize Here Is…

- Somewhat like what the soccer players would do
- You'd work on your abilities, you'd train, you'd worry about things like
  - Sleep
  - Energy
  - Focus
  - Health
  - Emotional state
- Right now that is pretty tough clearly! ☹
  - Yet rough situations can certainly be an effective teacher

We Avoid and Focus on Gear

- As a coder your ‘insturment’ is made up of your coding tools
  - Computer
  - Monitor(s)
  - Keyboard
  - OS
  - Editor/IDE
  - Language
  - Framework
  - Misc. Tools – Debuggers, Build Tools, Syntax Analyzers, etc.*
    - * Hesitate to break out since they are often part or heavily dictated by the IDE, framework
- We shouldn’t, but if are so focused let’s go there …

So what's your "*Trigger*"

https://en.wikipedia.org/wiki/Trigger_(guitar
https://www.youtube.com/watch?v=b6IB0trJoJU

Gear Up

- Computer – buy the best system you can always
  - I know we are students but really this is like being a musician please buy a good instrument!

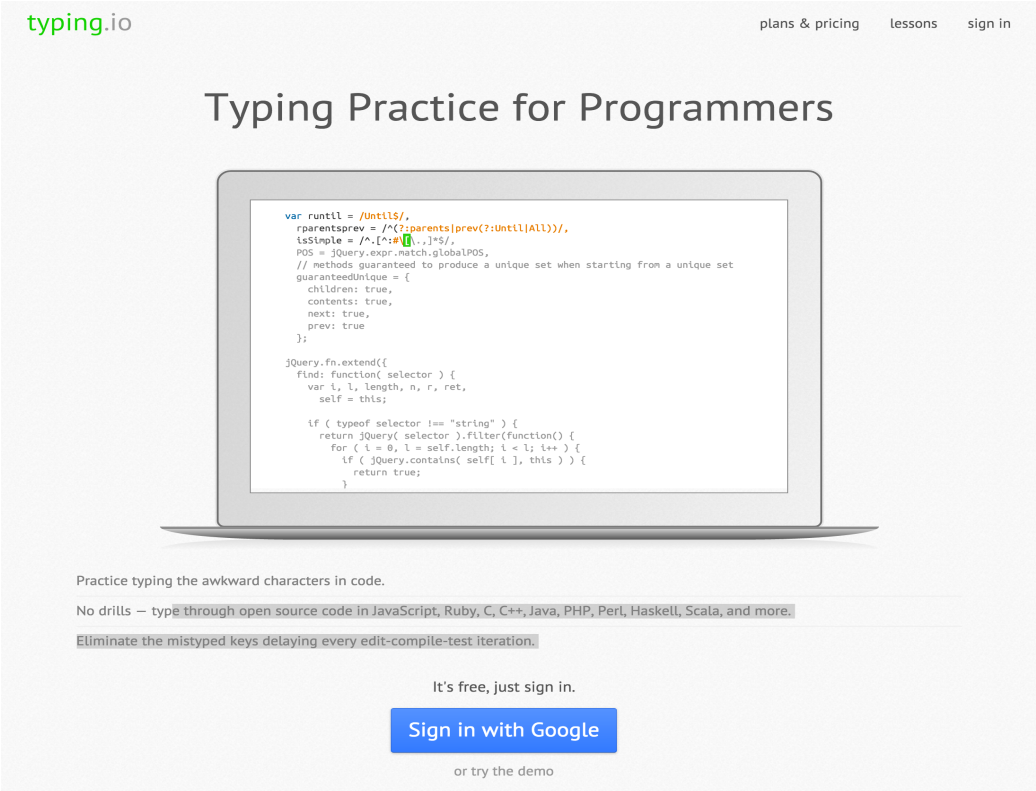
- Focus on I/O
  - Disk no, SSD yes
  - Multiple monitors or single wide monitor
  - Avoid cheap pointing devices
  - Keyboard (see dedicated slide)

- Connectivity
  - AirCards, WiFi access plans, VPN software if you must use public access points, fiber if you can get it

“Playing” aka Typing

- Being a code programmer requires you to be a good (fast and accurate) typist
  - http://blog.codinghorror.com/we-are-typists-first-programmers-second/
- Given the importance of typing
  - Get a good keyboard see next slide
  - Learn to type
  - Try to keep your hands on the keyboard at all times
    - Translation: Learn key commands, expanders, and build finger muscle memory
    - Window management, text expansion examples
  - Skeptical but strong opinions also surround possibility of changing to Dvorak keyboard - https://en.wikipedia.org/wiki/Dvorak_Simplified_Keyboard#Comparison_of_the_QWERTY_and_Dvorak_layouts

Interesting Service?



https://typing.io/

Good Keyboards

- A mechanical keyboard is widely thought as the way to go
  - http://blog.codinghorror.com/the-keyboard-cult/
  - http://www.tested.com/tech/accessories/460198-you-should-use-mechanical-keyboard/

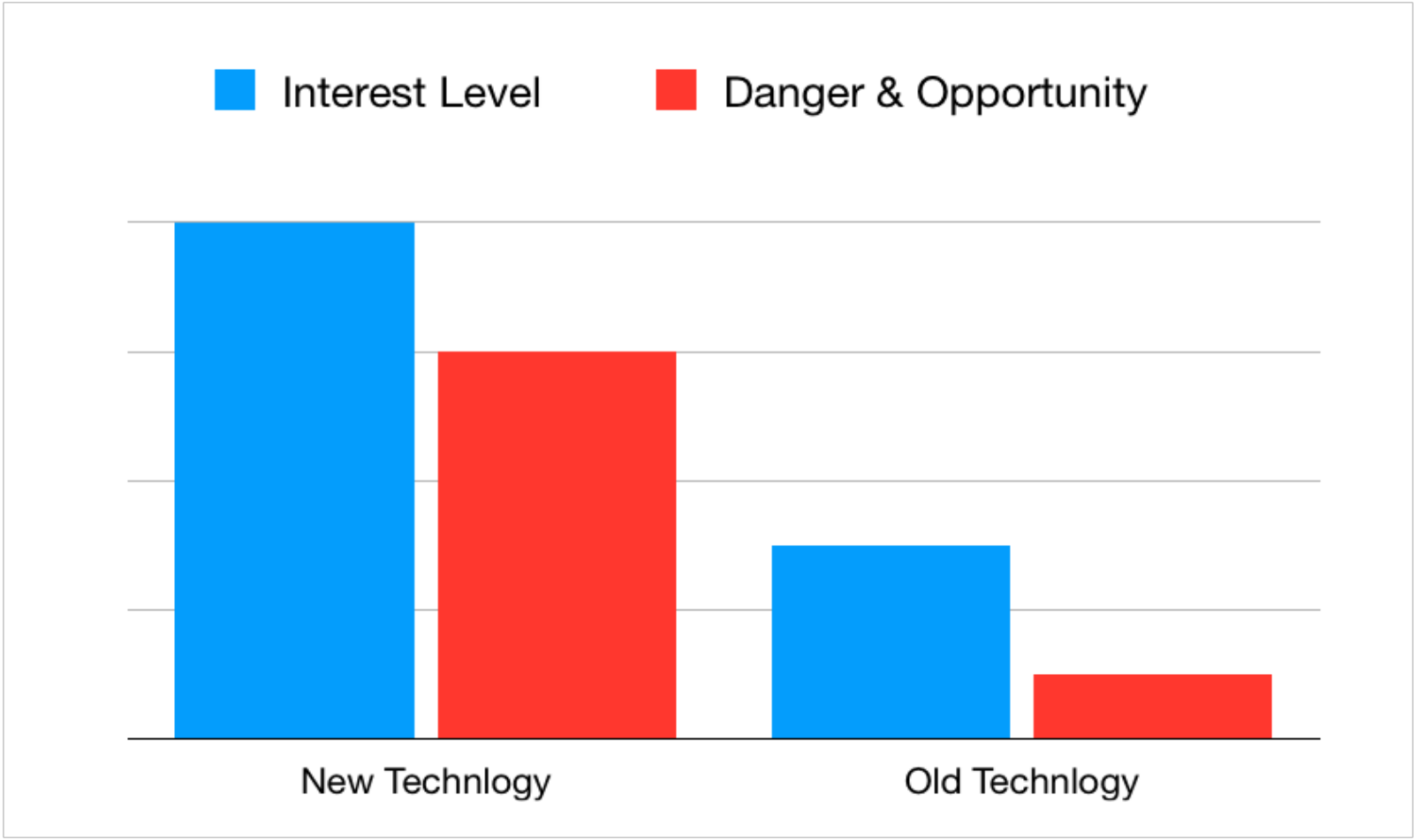
  - https://codekeyboards.com/
  - http://www.daskeyboard.com/
  - Check e-Bay to see how much vintage mechanicals still fetch

Another path to typing greatness?

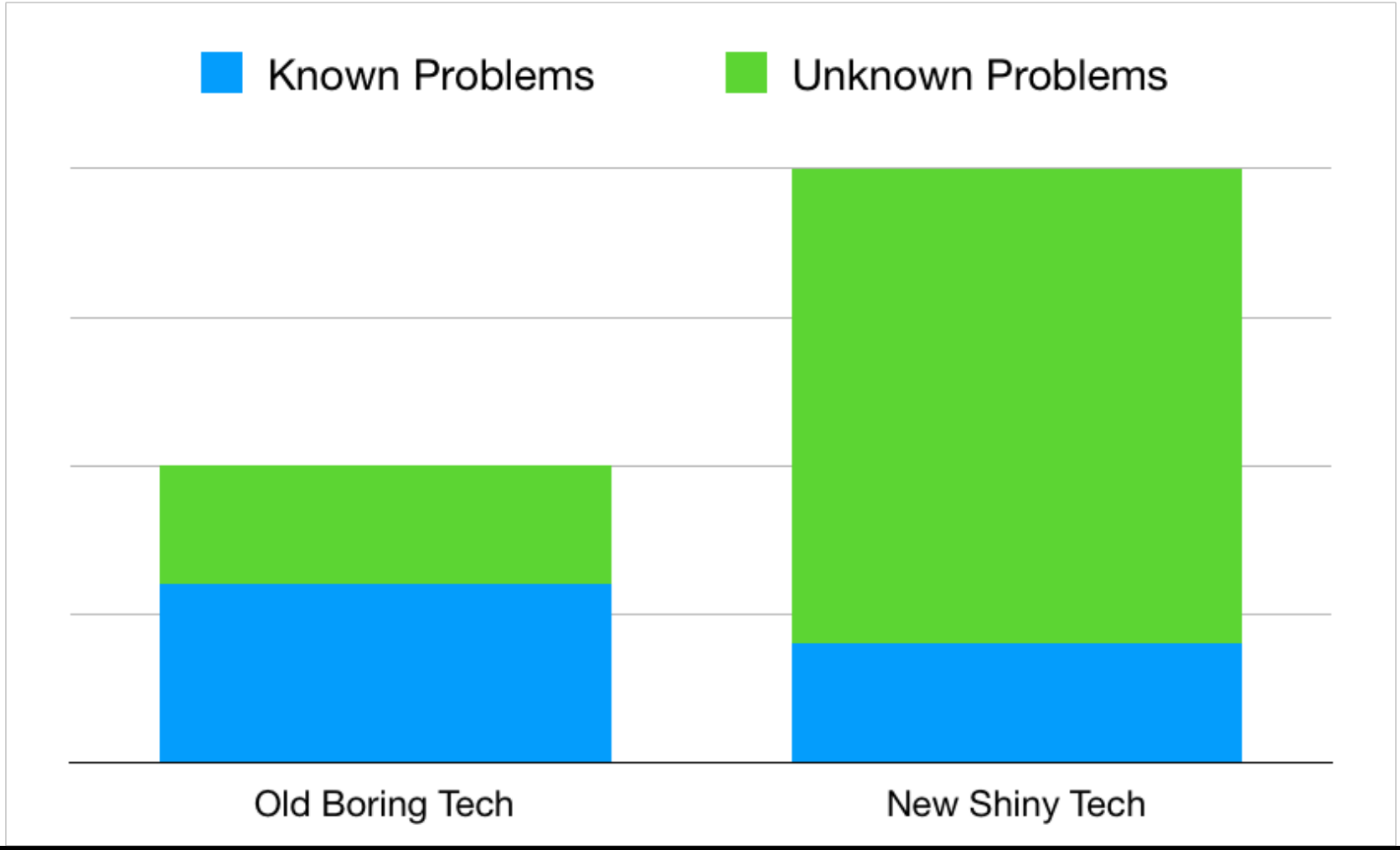
Tools

- We should certainly select good tools
- Rule: A good _____ does best with good tools, but good tools don't make good _____s.
- We should not be completely resistant to the evaluation of new tools after we mastered a tool though
- Tool analysis of course has to happen with Fact #5 and #6 firmly held
- Tool analysis also should be in light of specific need as opposed to generalized solution
- The newness or popularity of a tool is a far from perfect indicator of the value or efficacy of the tool

New & Old Tools/Tech Patterns?



Even though…


Known Problems
Unknown Problems
Old Boring Tech
New Shiny Tech

Gratification Problem?

- Seems almost as if we have some delay of gratification challenges here
  - Some influenced by those who would sell us stuff
  - Some influenced by our clear self-interest…get real we do need to stay relevant, so the crowds and their interests matter
  - Some pressure might be related at times to boredom or novelty
  - Some
  - I really wonder if we have a bit of the “Instant Cake” fable which while not quite true is quite instructive to today’s CLI fetishing
    - https://www.bonappetit.com/entertaining-style/pop-culture/article/cake-mix-history

Tool Belts and Boxes

- Given the programmer tendency to look for general solutions we see in industry an over emphasis on generalized tools or a search for the “one true tool”
  - Silver Bullets
  - LoTR Fixations

- Tools have trade-offs like anything else, best to have the correct tool for the job than a single tool for all jobs
  - Must acknowledge that too many tools leads to being good at nothing both because of lack of heavy use or tool compromise

- My pragmatic metaphor is the toolbox or tool belt then with some ‘go to’ tools within

Editors

- Compare to hammers - there is a range
  - Finishing, General/Claw, Framing, etc.

- Simple Text Editor
  - vi, emacs, Sublime, etc.
- Light Weight IDE
  - Coda
- Full IDE
  - Visual Studio, **VSCode,** IntelliJ (WebStorm), Eclipse

- Emphasizing
  - Mouse or Keyboard
  - Mode or not moded
  - Manual or Auto(complete)
  - Single Experience or Multi-Windowed/App Experienced

Trigger Doesn't Work Without…

Back to the big one!

- You!
  - Your brain
  - Your focus
  - Your energy
  - Your habits
- A large mistake being made by many programmers is ignoring the biologically and emotionally imposed limits of your abilities

Secret to Software Success

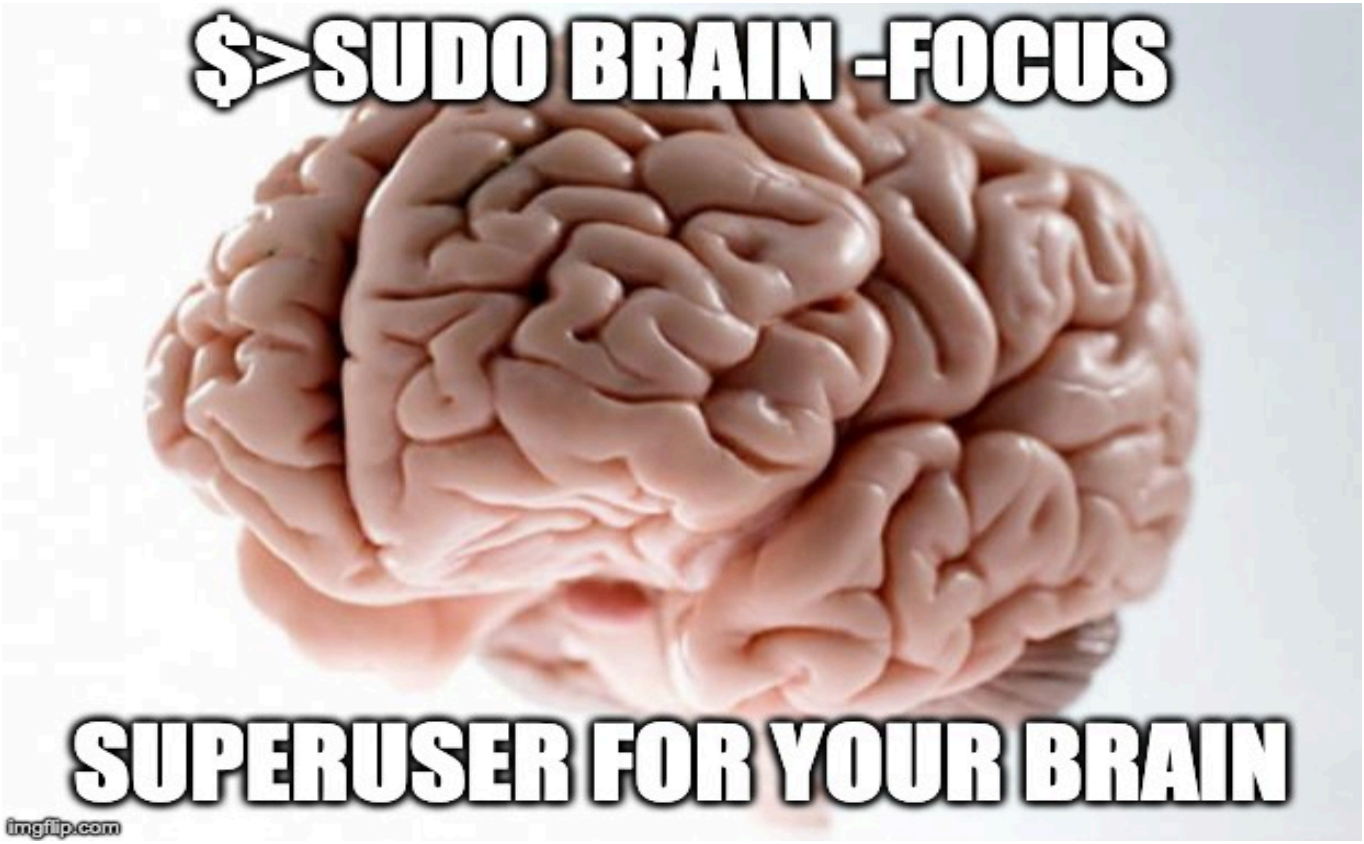
```
for i in people.data.users:
    response = client.api.statuses.user_timeline.get(screen_name=i.scre
    print 'Got', len(response.data), 'tweets from', i.screen_name
    if len(response.data) != 0:
        ltdate = response.data[0]['created_at']
        ltdate2 = datetime.strptime(ltdate,'%a %b %d %H:%M:%S +0000 %Y'
        today = datetime.now()
        howlong = (today-ltdate2).days
        if howlong < daywindow:
            print i.screen_name, 'has tweeted in the past' , daywindow,
            totaltweets += len(response.data)
            for j in response.data:
                if j.entities.urls:
                    for k in j.entities.urls:
                        newurl = k['expanded_url']
                        urlset.add((newurl, j.user.screen_name))
        else:
            print i.screen_name, 'has not tweeted in the past', daywind
```

Actually…

- This is actually not reasonable for many ways
  - Body and health would of course effect brain
  - We'd have to think about restfulness, moods, etc.
  - Pushing ourselves like that just isn't going to work, at least not over the long haul.
  - We'll not get into this now for time reasons, maybe later

- As we have limited time together so let's focus on the brain and what we can do to optimize it or be aware of things that will directly effect our thinking and code productivity

Do you have root access?

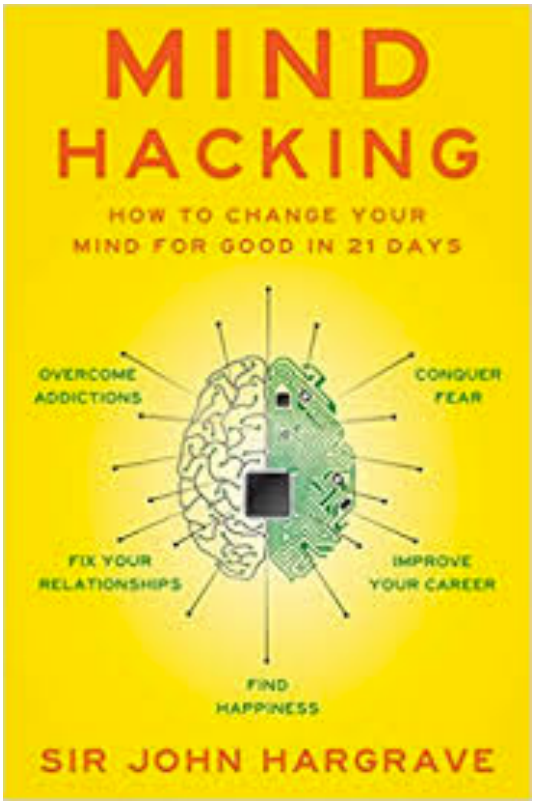


Should we hack it?

- The trick is becoming conscious of when you're in control of the mind (superuser mode) and when you're lost in the mind (user mode).

- Three Parts to the Hack
  - Analyzing
  - Imagining
  - Reprogramming

- Metacognition - think *about* our thinking
  - We CS types are often good at meta which is both good and quite bad at times



The Character of Mind

- At times, our brains are like misbehaving dogs
  - Positively though dogs can be trained!
- When are minds are like misbehaving dogs.
  - Technology toys are like squirrels in our front yards
  - Your mind craves information, that's what it eats.
    - Unfortunately, your mind has bulimia
- It takes attention to make attention, so we have to invest attention to create even more of it.
- Not new at all.
  - William James - "...the skill of voluntary bringing back a wandering attention, over and over again, is the very root of judgement, character, and will."

Two Minds

- Top Down – Higher Level
  - Powerful and allows us to decide to focus on the midterm
- Bottom Up – Lower Level
  - Helps us miss getting hit by the bus when some yells "look out”
- The two streams cross too often and bottom-up today has been exploited by those who know how powerful it is.
  - Sorry to disappoint, especially for those good at top down, but bottom up rules the day ultimately
- To reclaim attention and focus concentration you must attack from both top and bottom

Two Top Minds

- Even at the top we are more than one thing – it isn't all logic.
  - Are we computers that act emotionally OR emotional beings who try to act like computers
  - As logical as you might think you are your biological and emotional system severely effects you
    - Things dubbed soft skills or characteristics end up being weakened to the point of danger
    - If we had to make a D&D character for ourselves what are our stats?
      - Intelligence? Wisdom? Constitution? Strength? Charisma? Etc.
      - Are we balanced characters?
- While we are not computers obviously interestingly, we driven by loops
  - Improve your loops improve yourself

METAL

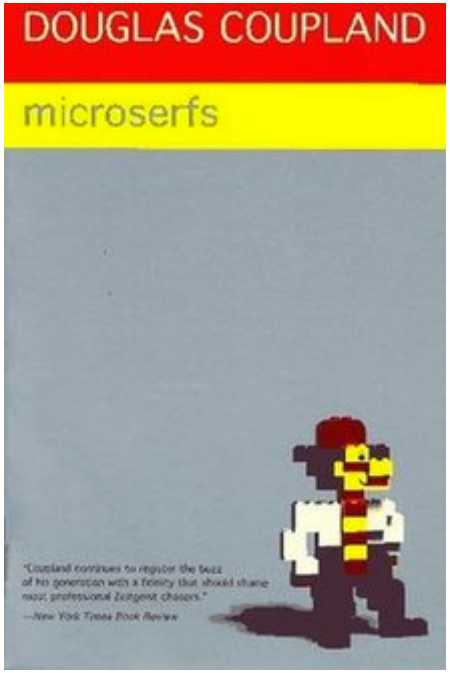
- **M**y
- **E**motional
- **T**hought
- **A**ction
- **L**oop

Come on Prof…really

- Yeah really. Believe the ancient philosophers or believe modern sports if you like, it is the same advice
- Ask yourself a question, why do the elite athletes have “mental coaches”
  - Seattle Seahawks example
- Nearly all the elite people in sports and executional type things know this
  - Mental Simulation
  - Pro Golf Example – Reverse Movie Playback Visualization
  - The Media Knows This – How many times do you need to see it to realize this is real?
    - Example: The movie Rocky? Many Kung-fu movies? Describe the “montage”
  - Ask Steve Jobs – watch some of his noted various speeches

Soft/Special/Extra Skills = $$$$$$

- If $ is what you want I strongly believe the faster route is working on these skills
- We do not want to be
  - Code Farmers, Meat Bots, Work Units, expanded “head count”, etc.



https://en.wikipedia.org/wiki/Microserfs

What I have Observed

- Poor or Average Software Engineers are just coders and find themselves troubled by tech shifts
- Good Software Engineers are at least somewhat Social Engineers and are less troubled by shifts and make predictable $ gains over time.
- Great Software Engineers are almost always often polymaths who happen to code and often can name their price.
- If you want to be great, you'll ignore these observations at your peril, as so far 25 years+ they are holding other than random cases for me*
  - Tip: I avoid arguing with "lotto winner" style thinkers. If your friend's cousin did none of this and got millions as a coder know we can find someone who went to 7/11 and got millions in the lotto too. We can't all be special cases anyway!

Productivity Myths

- Maximum productivity is a myth

- Novice Programmers – believe in utopian workdays
- Experienced Software Engineers – accept real world days

- Real world agile does fundamentally agree with this in that in the estimation phase one is supposed to include a velocity factor (often 0.7) to temper work availability and estimates

Work Rhythms Part 1
Time of Day

- Many people argue strongly for morning work regardless of discipline as the most effective approach for productivity increase
- A decent number on the other side cite individual energy patterns and push night work
- Few seem to argue for midday and afternoon work as it appears that human cycles and societal patterns don't seem to make this a great time for productivity
- My experience suggests it is ultimately it is somewhat the way a person is wired. However, rest seems to result in better work energy (thus the morning or the nap or exercise push) and interruptions tend to be a big deal (thus the night or early morning) and tiring out plus food comas are real so watch out for the afternoon. Ask Ben Franklin, Edison, Churchill, about naps, work, booze, rest, etc.

Work Rhythms Part 2
Length of Work

- The problem with too much particularly all at once
- There are clear diminishing returns in focus and quality that have been measured
  - Again this is not at all specific to programming
- Idea: Employ the Pomodoro Technique
  - 25mins on, 5 mins off, work iterations if you like
- Roughly it appears particularly over time it is better to 2-4 hours focused attention (in flow hopefully) daily than 8+ hours of diminishing energy and distraction

Work Rhythms Part 3
Variety and Type of Work

- It is clear that some types of work requires heavy concentration and other type of work doesn't
- Try to schedule your efforts for your energy and focus availability
- Cleaning code and making it meet a style guide can be a great mindless break, but why waste high energy hours doing that?
  - Easy to see people do this when they check off the easy items in an issue tracker right away thinking it builds momentum
  - Productivity research seems to suggest instead you would do better tackling harder things first when energy and attention is most plentiful
- Task switch is like "mental crop rotation" when done right and is distracted and inefficient thrashing when done wrong

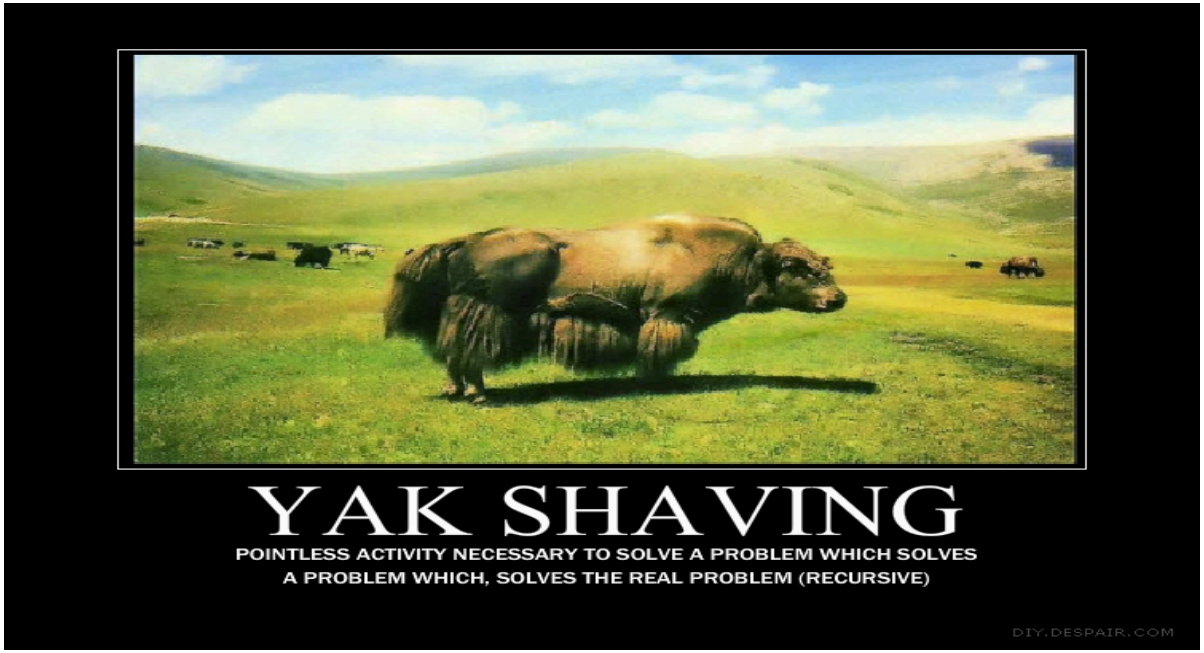
Movie Time

The Sequel with Science!

Work Rhythms Part 4
Multitasking and Distraction

- Multitasking just doesn't work. Period. Stop.
  - Yes, we do it, but at our detriment for programmer productivity
- The Internet sings a constant siren song of better opportunities and information just over the horizon
  - There appears to be a generalized fear of being left behind, whether it be a social update or a new framework
- We can easily trick ourselves to seek out more motivating things often in the guise of being looped into what we are supposed to be doing
  - Examples: Product Hunt, Reddit, Hacker News, TechCrunch, etc.
  - We even see people with productivity porn like habits always looking for the new GtD system, Todo list, Lifehack, etc.!

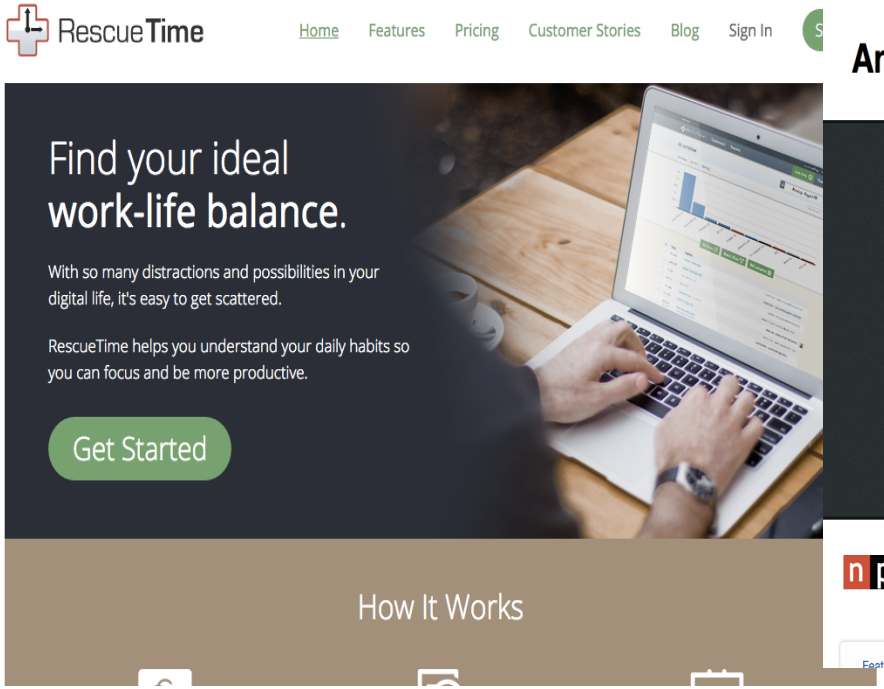
Yak Shaving != Productivity



http://www.hanselman.com/blog/YakShavingDefinedIllGetThatDoneAsSoonAsIShaveThisYak.aspx

http://sethgodin.typepad.com/seths_blog/2005/03/dont_shave_that.html

Why do we need these?



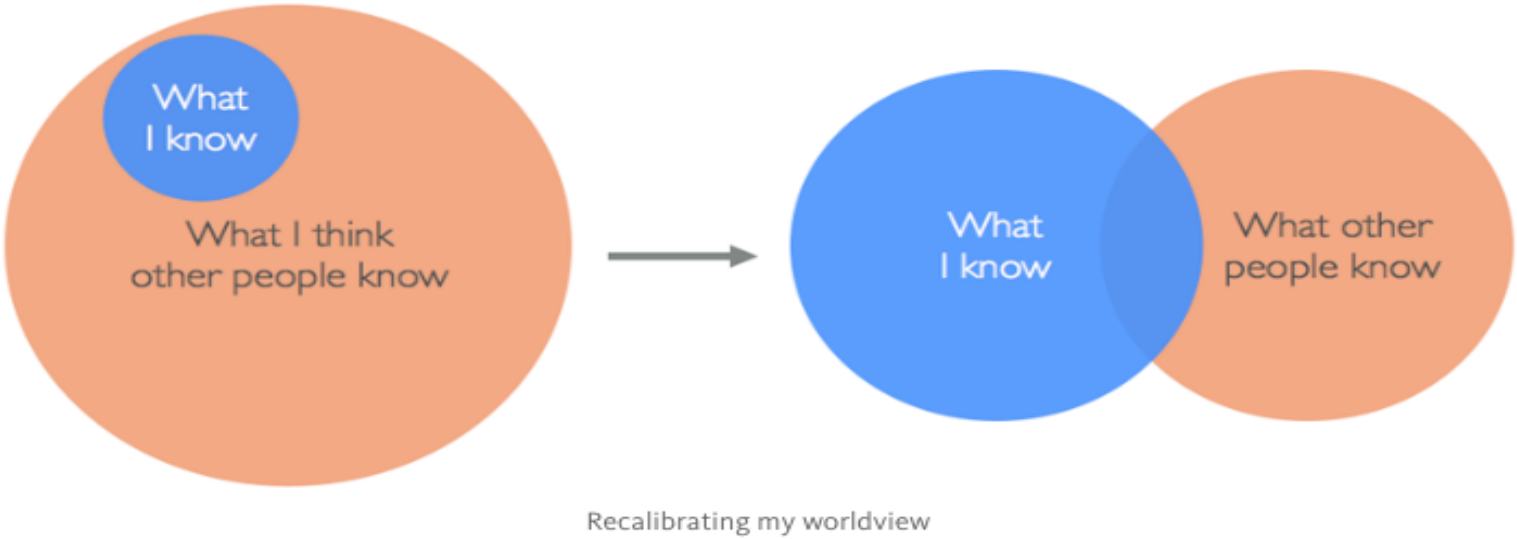
Work Rhythm Part 4
Flow State

- Focused concentration where lots of other things melt away and you often are highly effective (and calm)
  - https://en.wikipedia.org/wiki/Flow_(psychology)
  - http://psygrammer.com/2011/02/10/the-flow-programming-in-ecstasy/
- Getting into flow state is difficult somewhat like meditation and requires practice
  - Getting knocked out of it is easy with interruptions
    - Headphones, private offices over open floor plans
    - Distractions – chat, email, the Internet ☺
- Generally a few hours of flow is better than a day of bouncing around, even though you might feel you worked a lot you might have accomplished a little

Living with Imperfection

- Fact: Some days just don't go well and you won't get into flow at all
- Very productive good days shouldn't be interpreted as what should always happen and in fact may only be good relatively or be enabled because of many "less good" days
- Ultimately you will fail
  - You will …
    - write some boneheaded code
    - push broken code to master
    - overwrite working code
    - get very little done
    - Add your own
- Be **very** careful relating an unproductive day, bad code review, screwed up algorithm, crash, etc. with your own self worth.

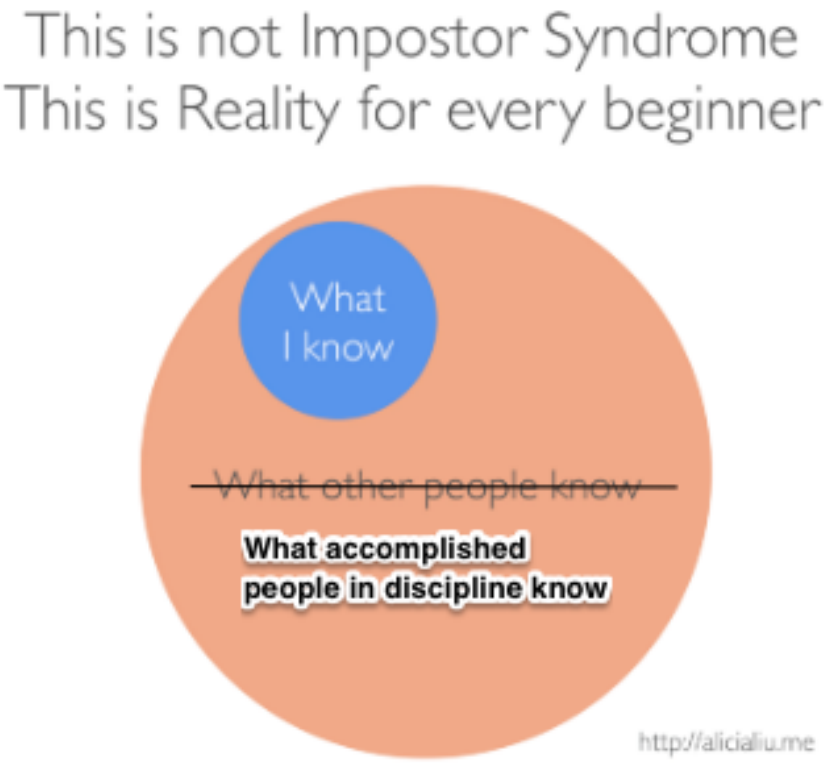
Impostor Syndrome



https://medium.com/@aliciatweet/overcoming-impostor-syndrome-bdae04e46ec5#.jl5rmjs2u

https://www.reddit.com/r/cscareerquestions/comments/1tbmmm/how_do_you_deal_with_impostor_syndrome_as_a/

Healthy View of Being Novice



Perfectionism

- https://en.wikipedia.org/wiki/Perfectionism_(psychology)
  - This is actually not a positive trait; some tendencies are but in general it is very counter productive
- Perfectionism really seems anti-Agile as agile embraces continuous improvement
  - In my experience perfectionists don't ship software often and when they do it isn't perfect anyway
- Procrastination is related to perfectionism

Programmer Personalities

The 5 types of programmers

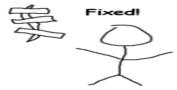
July 18th, 2010 – Desktop Development, Web Development (Opinion) 272 Comments »

In my code journeys and programming adventures I've encountered many strange foes, and even stranger allies. I've identified at least five different kinds of code warriors, some make for wonderful comrades in arms, while others seem to foil my every plan.

However they all have their place in the pantheon of software development. Without a healthy mix of these different programming styles you'll probably find your projects either take too long to complete, are not stable enough or are too perfect for humans to look upon.

The duct tape programmer

The code may not be pretty, but damnit, it works!



This guy is the foundation of your company. When something goes wrong he will fix it fast and in a way that won't break again. Of course he doesn't care about how it looks, ease of use, or any of those other *trivial* concerns, but he will make it happen, without a bunch of talk or time-wasting nonsense. The best way to use this person is to point at a problem and walk away.

The OCD perfectionist programmer

You want to do what to my code?

This guy doesn't care about your deadlines or budgets, those are insignificant when compared to the art form that is programming. When you do finally receive the finished product you will have no option but submit to the stunning glory and radiant beauty of perfectly formatted, no, perfectly beautiful code, that is so efficient that anything you would want to do to it would do nothing but defame a masterpiece. He is the only one qualified to work on his code.

The anti-programming programmer

I'm a programmer, damnit. I don't write code.

His world has one simple truth; writing code is bad. If you have to write something then you're doing it wrong. Someone else has already done the work so just use their code. He will tell you how much faster this development practice is, even though he takes as long or longer than the other programmers. But when you get the project it will only be 20 lines of actual code and will be very easy to read. It may not be very fast, efficient, or forward-compatible, but it will be done with the least effort required.

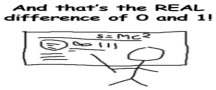
The half-assed programmer

What do you want? It works doesn't it?

The guy who couldn't care less about quality, that's someone elses job. He accomplishes the tasks that he's asked to do, quickly. You may not like his work, the other programmers hate it, but management and the clients love it. As much pain as he will cause you in the future, he is single-handedly keeping your deadlines so you can't scoff at it (no matter how much you want to).

The theoretical programmer

Well, that's a possibility, but in practice this might be a better alternative.



This guy is more interested the options than what should be done. He will spend 80% of his time staring blankly at his computer thinking up ways to accomplish a task, 15% of his time complaining about unreasonable deadlines, 4% of his time refining the options, and 1% of his time writing code. When you receive the final work it will always be accompanied by the phrase "if I had more time I could have done this the right way".

http://stevenbenner.com/2010/07/the-5-types-of-programmers/

Mental Costs of Decisions

- Optimal decisions and will power have been studied to come from a finite source
  - This source is related to rest and glucose availability
- Generally this idea is related to what is termed decision fatigue
  - https://en.wikipedia.org/wiki/Decision_fatigue
- General Effect

  "…if your willpower is depleted, you're more likely to make a decision that's good in the short-term, but bad in the long-term. Once your willpower is depleted, you become less likely to thoroughly consider the complex tradeoffs some decisions require."
  http://greatnotbig.com/2011/08/decision-fatigue/
- Trouble: Coding is filled with decisions!

Decision Fatigue and the Modern Programmer

- Programmers are people this stuff effects us
  - Maybe more than the average person since we work so heavily with decisions
  - http://effectivesoftwaredesign.com/2011/08/23/how-decision-fatigue-affects-the-efficacy-of-programmers/

- Example: Copy-Paste coding
  - What's easier thinking out an abstraction or copying paste some working code?
  - Answer: The later
  - Downside: Your code bloated! Short-term gain but long-term consequence of software rot, technical debt or fragility

Wait what!? Why?

```
if (me.initAfterRender) {
  if (me.initIf && eval(me.initIf)) {
    me.widget.on('afterrender', me.init, me);
  } else {
    me.widget.on('afterrender', me.init, me);
  }
} else if (me.initOn) {
```

Tech Fatigue

- Computing and the web space in particular suffers from a proliferation of technologies
  - http://www.sitepoint.com/drowning-in-tools-web-development-industry/
  - https://medium.com/@ericclemmons/javascript-fatigue-48d4011b6fc4#.tvzld2bjg
  - TodoMVC example
  - Languages that compile to JS
- Generalized false assumption: 2.0 better than 1.0
  - If so, why do the majority of movie sequels suck so bad!?
- Combine this with impostor syndrome (if I don't learn X I am not worthy) and perfectionism (better tool or approach just over the horizon) and you can spend more time evaluating than doing (remember Yak Shaving?)

Decision Off Load

- Employing deep higher-level thinking uses lots of decision energy and is ‘expensive’

- Solution 1: habits offload decisions
  - Think CPU vs GPU, we want to move lots of our stuff to the “HPU” (Habit Processing Unit) of coding
  - Conclusion: We should develop good programmer habits or programming practices

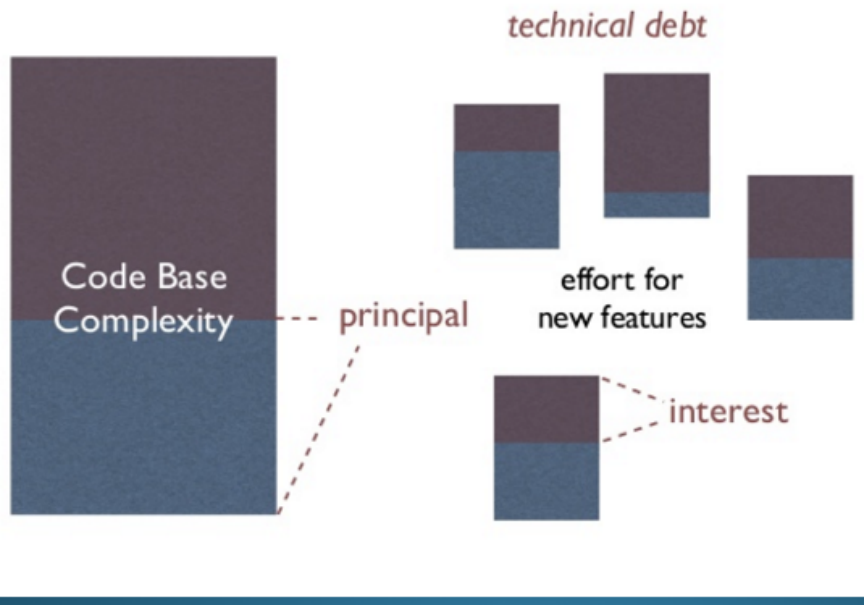
- Solution 2: outsource decisions
  - Use mental short-cuts like social proof to make decisions
  - Opinionated Programming and Frameworks – people make a decision and you just should accept it, it’s easier
  - Solution 2 seems pretty dangerous and goes against our premise of only being able to control for ourselves

Good Habits

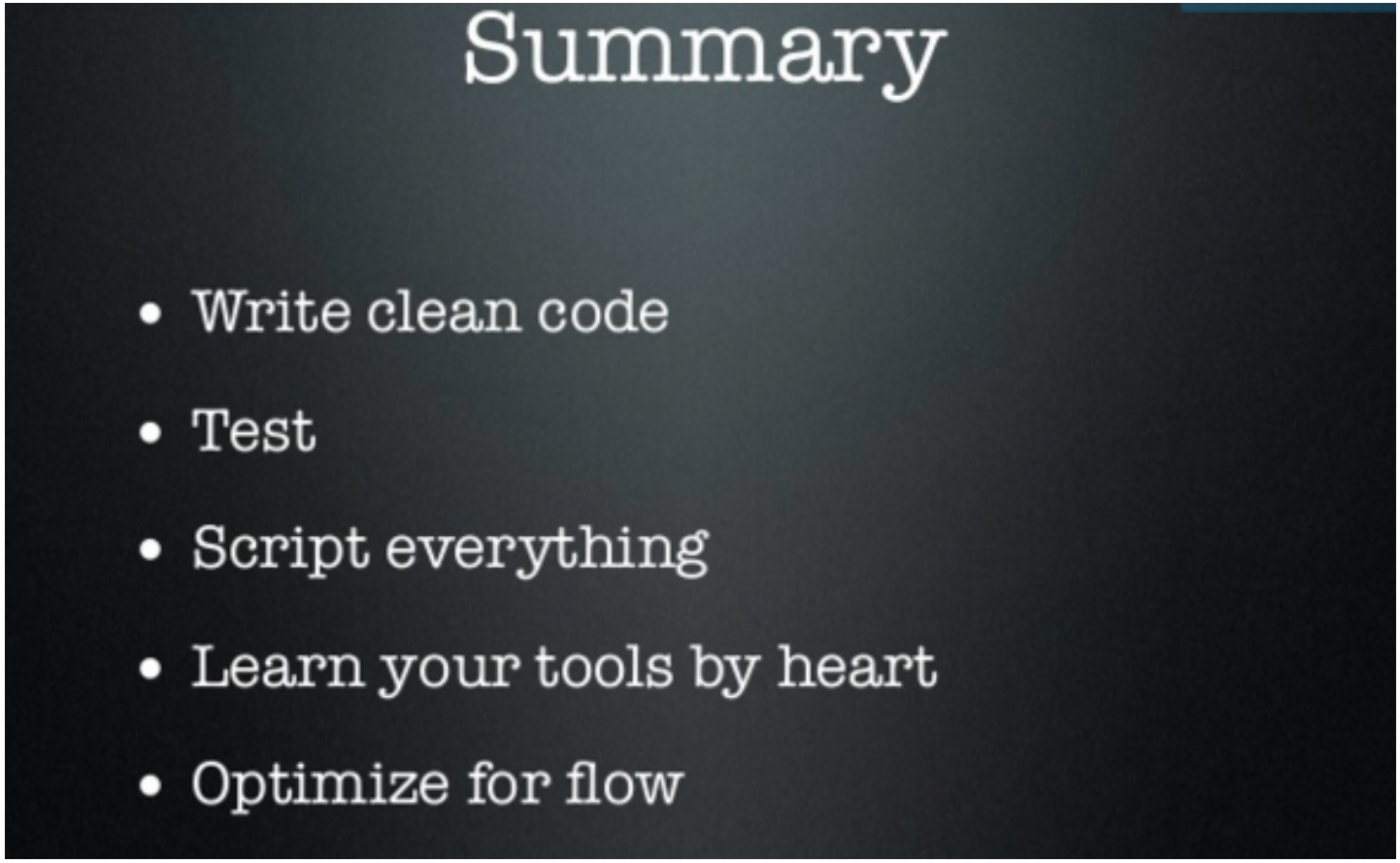
- Habit - an acquired behavior pattern regularly followed that becomes almost involuntary
- Habits are the kind of the things that can lead to some forms of ‘multitasking’
  - The muscle memory of editing and reformatting for example
- How long to develop a habit?
  - 21 days, 6 months, a long time
- Hard to stick to habits
  - Try ‘Micro Habits’ – 1 yard plays is what I call this
    - Code cleaning, relate to job site cleaning and technical debt
- Keystone Habits can lead to much much more

Habit Example

- Cleaning up the work site I mean code base is a really good habit to have
  - If you don't clean up, generally bad things happen (eventually)
  - "Sweeping" your code can be the boring part but it is vitamins that avoids your eventual need for aspirin

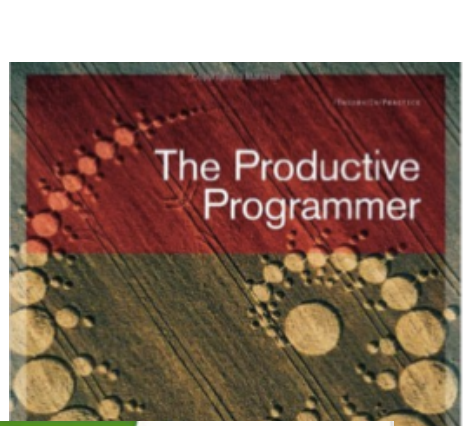


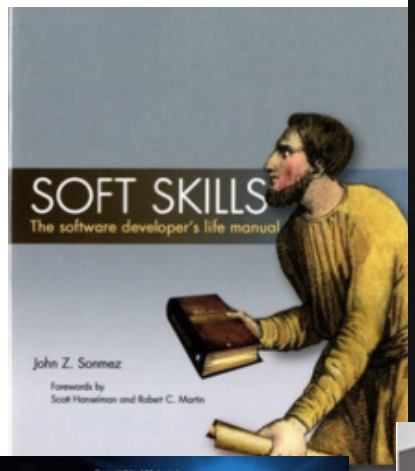
Habits of The "Good" Programmer Trending Again

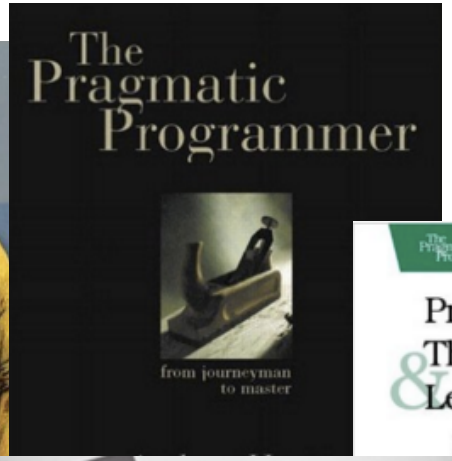


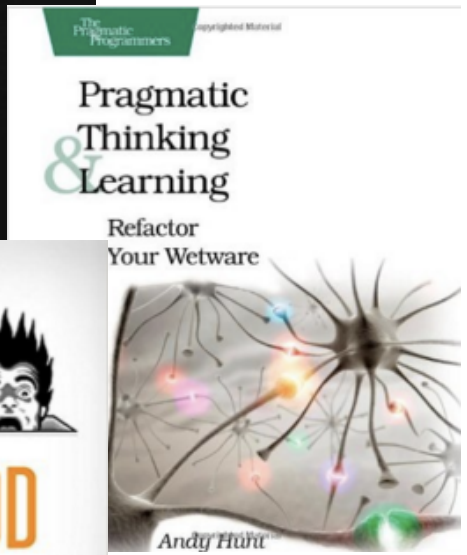
http://www.slideshare.net/andersjanmyr/habits-of-a-responsible-programmer

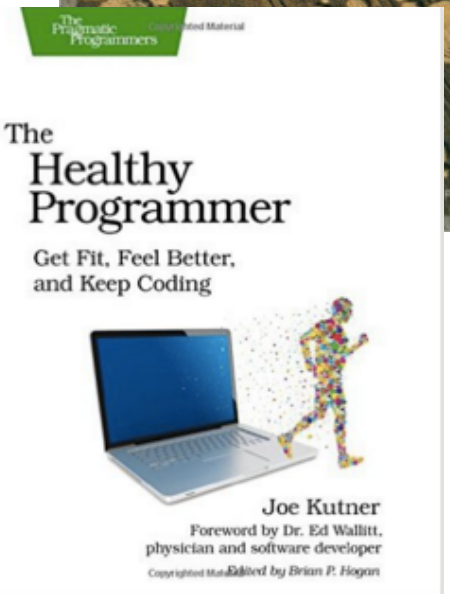
Hmmm…There's a Reason

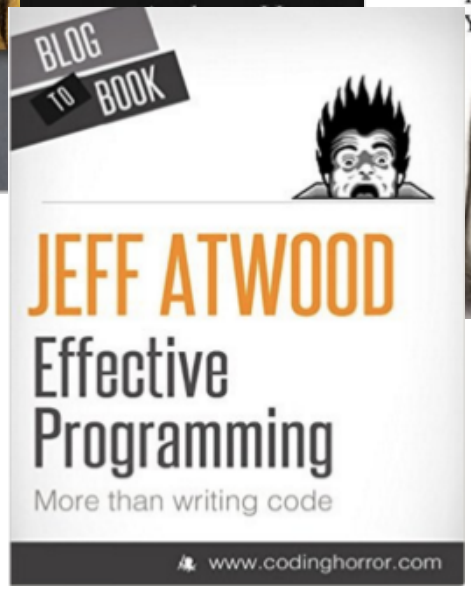






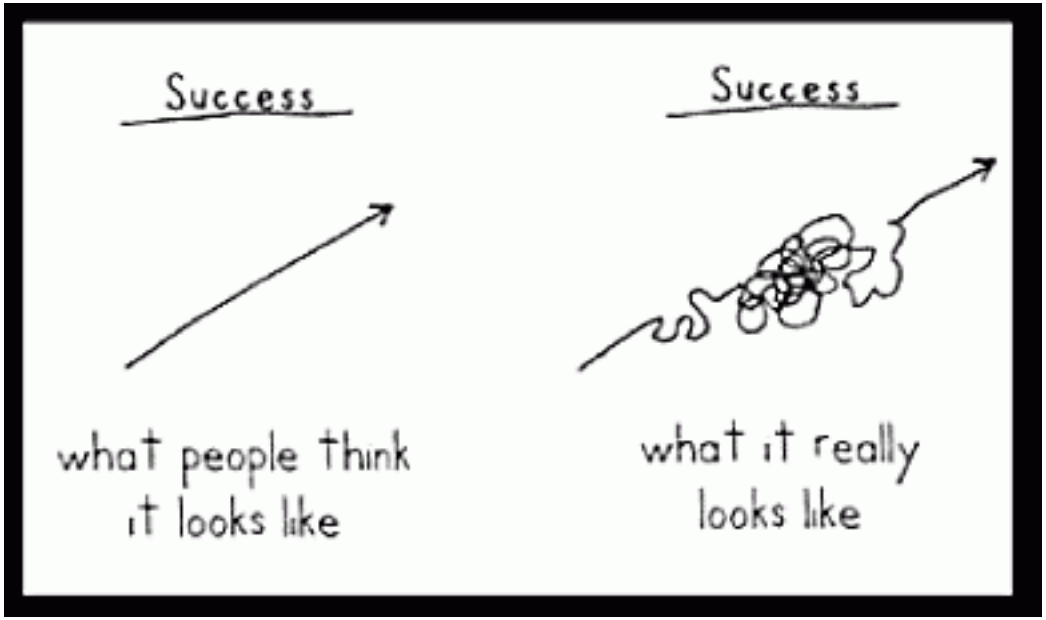




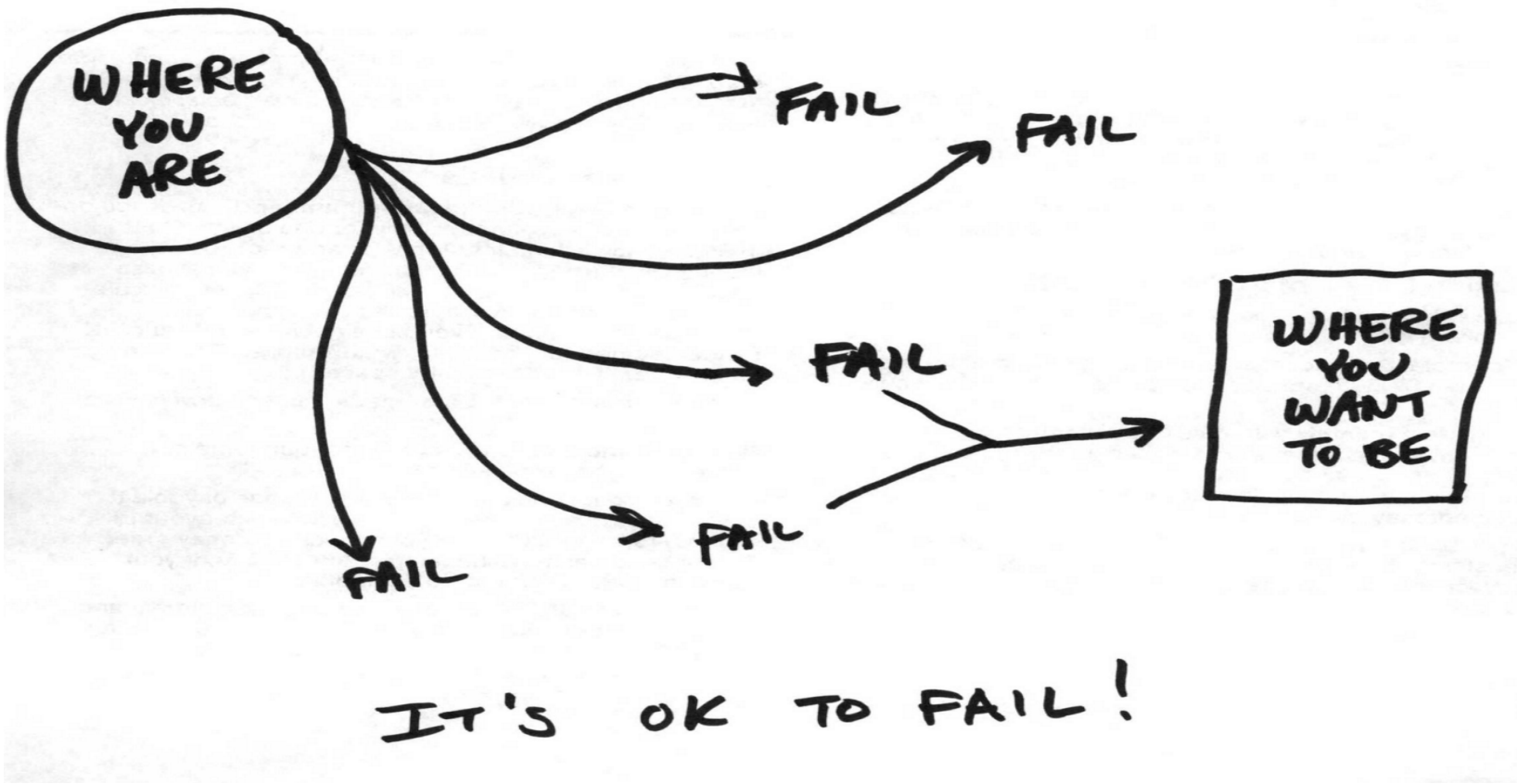


Embrace Failure

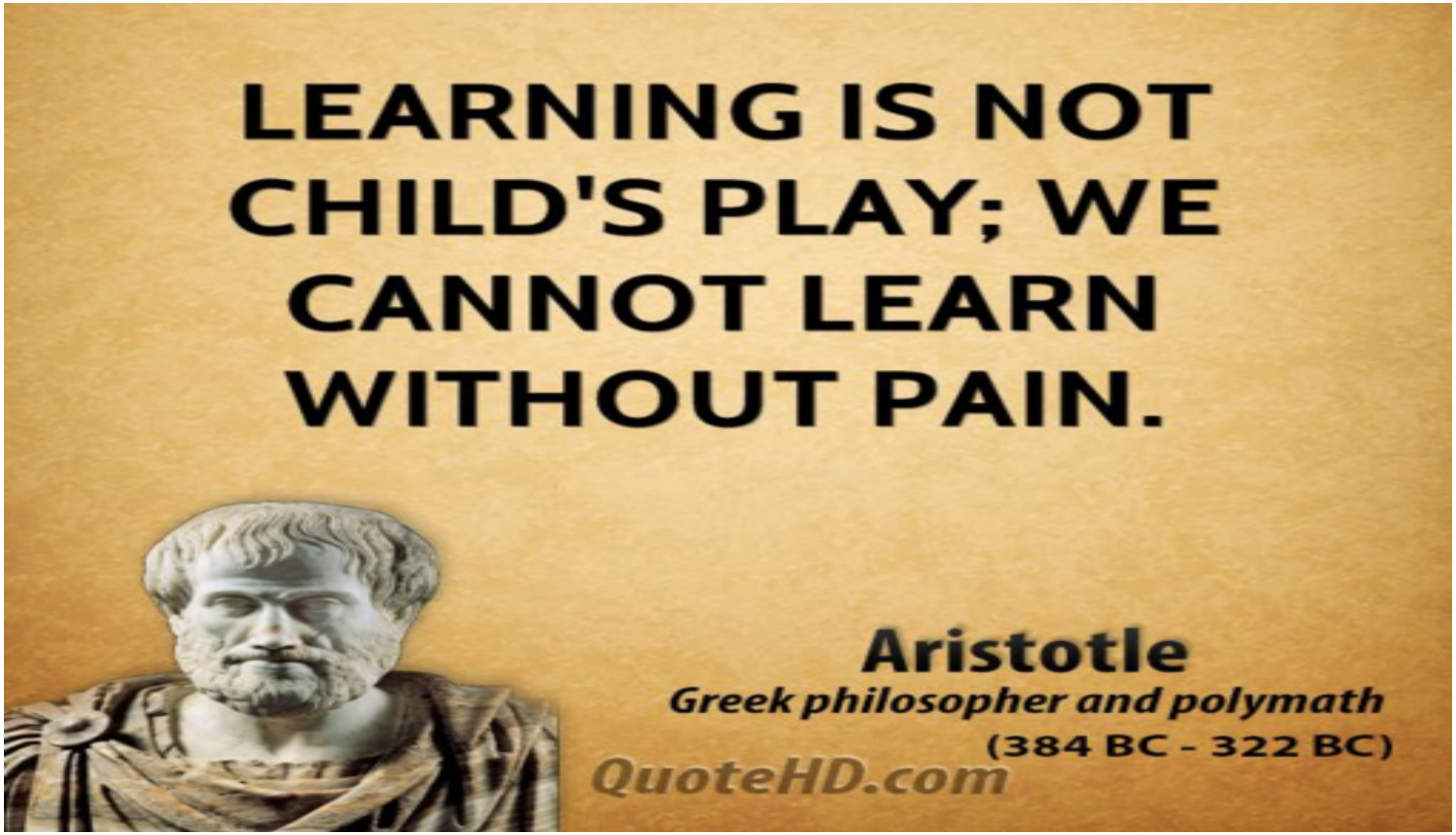
- Generally getting to a successful outcome takes many failed outcomes.
  - Well known quotes from Edison and others
- This often goes against the romantic idea of things

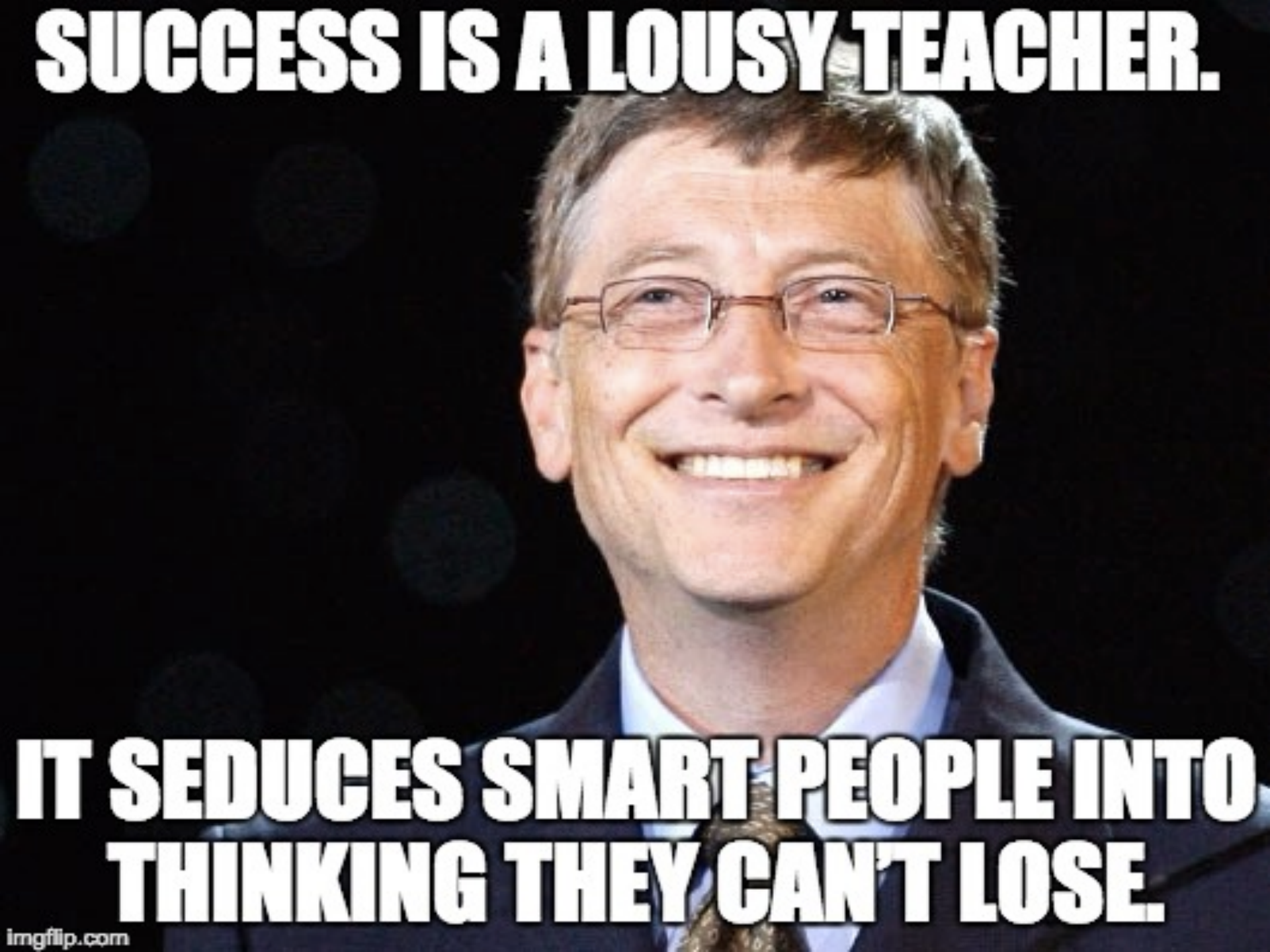


Seeing the path to success from the place you failed



The pain of learning and failure is certainly not a new idea



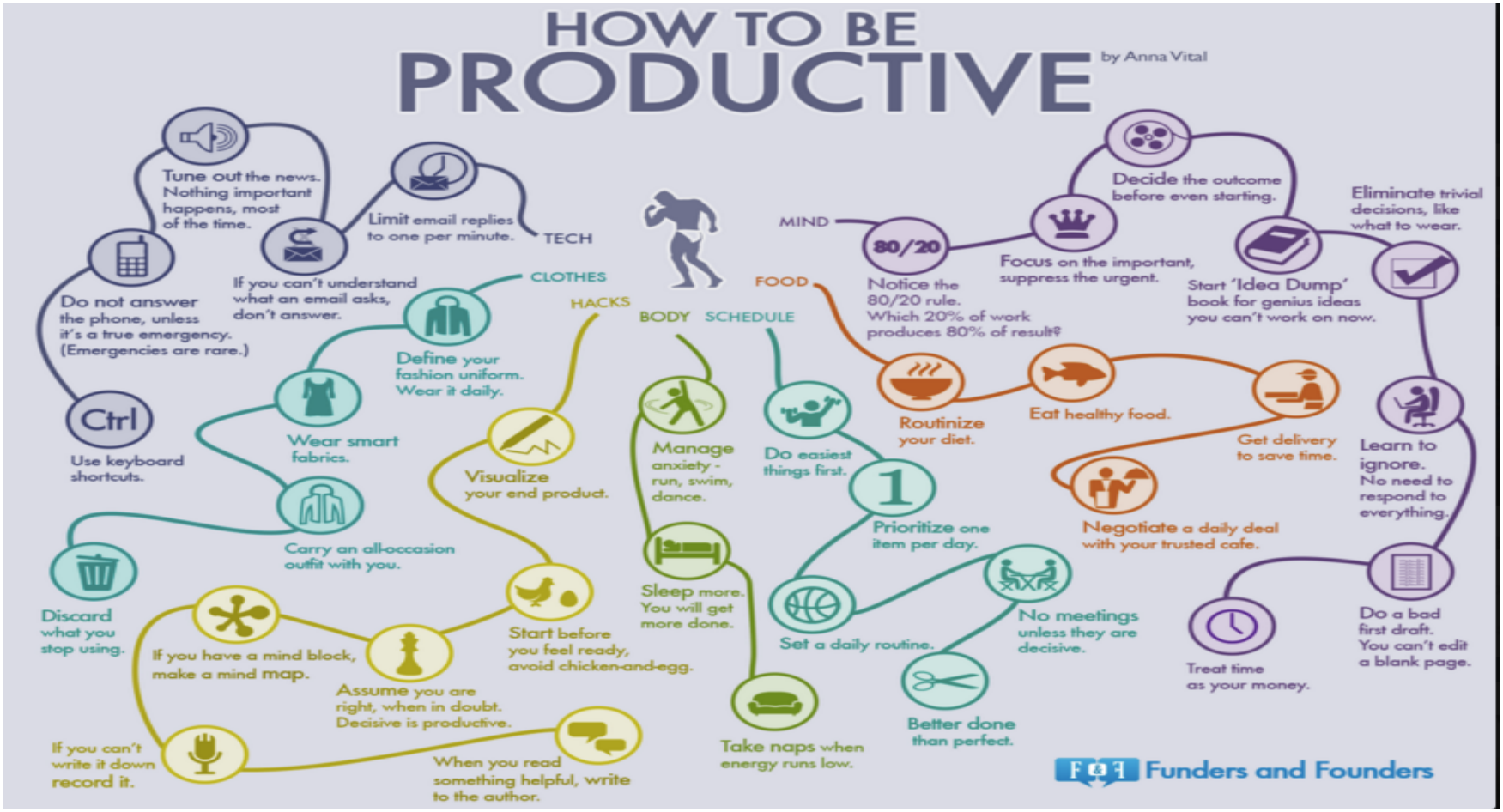

SUCCESS IS A LOUSY TEACHER.
IT SEDUCES SMART PEOPLE INTO THINKING THEY CAN'T LOSE.
imgflip.com

Train for a Marathon, Not Sprints

- Most self-aware successful people tend to acknowledge the role of perseverance, timing and luck in their eventual success
- Writing meaningful code takes quite a LONG time
  - If your code becomes legacy then you win…it generally means it is useful!
- Careful mistaking that you prove the reverse with the speed code effort using the proof of idea by PoC aim of MVP development, hackathons, market effects, etc.
- Code can be like wine, it can age well, but only under the right conditions and processes, take UNIX as an example. Converserly code can be like milk and spoil quickly, especially if exposed to unstable dependencies and environments


TIMING, PERSEVERANCE,
AND TEN YEARS
OF TRYING WILL EVENTUALLY
MAKE YOU LOOK LIKE
AN OVERNIGHT SUCCESS.
-BIZ STONE
imgflip.com

Finally – A Graphic Overview?



Stop, Drop and Apply

- Clearly, we can get quite off track and end up deep in self-help tactics and introspection
  - Maybe not a bad thing unless it leads to analysis paralysis
  - However, none of this stuff is good for us as aspiring Software Engineers unless we find some applied use for it

- For our remote quarter I think this deck will be more important than it usually is so whatever you can do to apply structure and improve yourself will probably pay off in ways well beyond success with your team or this course.
  - If you do discover tools or techniques, we especially want you to share.

Coming Up in CSE 112

- Leader Selection
- Remote Group Launch
- Group Dynamics Lecture
- Team Building Exercise
- SE Approaches and Tooling Wide Cut
- Initial check-ins with TA, Tutor, Prof