# How to Learn

CS16: Introduction to Data Structures & Algorithms

Spring 2020

# Expectations

‣ CS16 material is very challenging

- ‣ we have to cover a lot of material

- ‣ a lot of problem solving *w/o "recipes"*

- ‣ a lot of completely new material

- ‣ a new mindset

‣ No one "just gets it"

- ‣ Not me, not Doug, not the HTAs, not the UTAs

# Sound Familiar?

"I'm just not good at CS"

"I'm not really cut out for this"

"It just doesn't come as easily to me as others"

"It takes me so much longer than
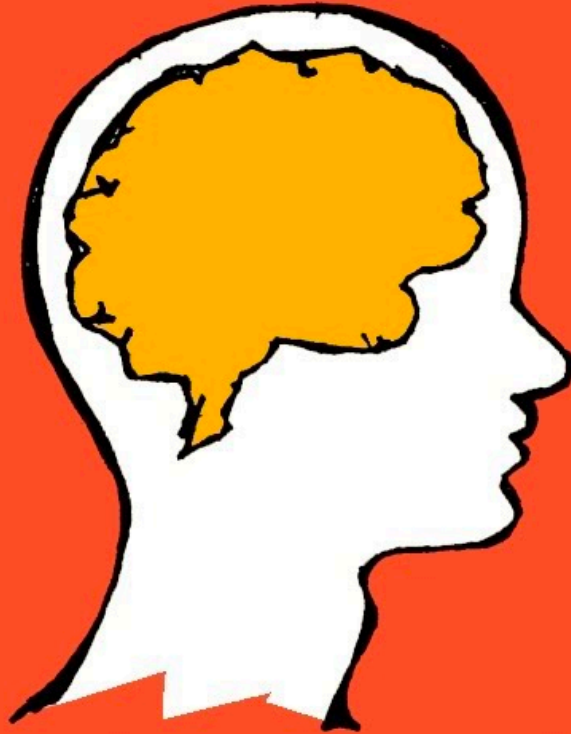everyone else to do the HWs…"

# Natural CS Ability?

‣ No one has a natural CS ability?

  ‣ That's ridiculous!

‣ People who impress you have experience

  ‣ they've seen *it* or *something like it* before

# Maya!

# HS to College



- ▸ Jump from HS to College is massive

  - ▸ What you did in HS won't always work in College

- ▸ Most HS athletes have to adapt to College level

  - ▸ and so do you!

- ▸ It took me some time to really understand this

  - ▸ Once I did my grades improved massively

# What's Holding You Back?

‣ Different for everyone

‣ For me

   ‣ too many extracurriculars/commitments

   ‣ completely unorganized

   ‣ no study techniques

‣ No one had ever told me these things mattered

# Commitments

‣ This material is hard and takes time to learn

‣ Time is needed to

1. attend lecture where you hear material for first time

2. go over lecture again so you hear it for second time

3. go to Section

4. do homeworks

5. do projects

6. go over concepts & techniques you didn't get in 1-6

# Time Management System

- How do you manage your time?

- Have a plan for your Month & Week

- Minimal time management system

  - Sunday night plan everything for upcoming week

    - down to the hour!

    - make sure to overestimate how long something will take

  - adjust as the week progresses

## ~~MONDAY~~

### Text books

| | | |
|---|---|---|
| • Income Tax Book #1 | Buy new - Amazon | $210 |
| | Rental - Bookstore | $33 |
| • Income Tax Book #2 | Rental - Bookstore | $8 |
| • Real Estate Transaction | Rental - Amazon | $87 |

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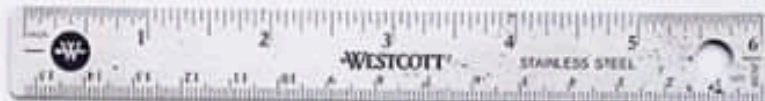
## Monday Aug. 15

### Personal
- X Close Interest Bank Account
- • Research Textbooks →
- X Check Uni E-mail
- X Get Cash from ATM
- X Contact School about Externship

### Business
- X Set up DFU
- • Look into forms header
- • Figure out Bot Problem →
- X Do user testing
- X Look at Job listings

B: N/A   L: Brick oven Pizza   D: Sushi   S: Popcorn

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## Tuesday Aug. 16

### Personal
- ☑ Dr. Appt.
- △ Lunch with Pat
- X Research Textbooks
- X Check fluids in car
- X Drive... All day

### Business
- • Look into forms header →
- • Figure out bot Problem →
- • Clean up side bar →

B: N/A   L: Eggplant Sandwich   D: Orange Chicken Fried rice   S: Pringles, Skittles, Driving but...

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## Wednesday Aug. 17

### Personal
- X Order Textbooks
- X Reply to externship Email
- X Reply to Schiff and Dykeman Email

### Business

B: N/A   L: Pizza   D: Leftover Pizza... OH No   S:

# Time Management System

- ▸ Bullet Journals

    - ▸ https://bulletjournal.com/

- ▸ *Analog* time management & note taking

- ▸ Can get very elaborate but some simple variants too

# A computer-science professor at Brown uses a single text file to organize his to-do list every day — here's what it looks like

Jeff Huang, Brown HCI   Feb 17, 2020, 11:00 AM
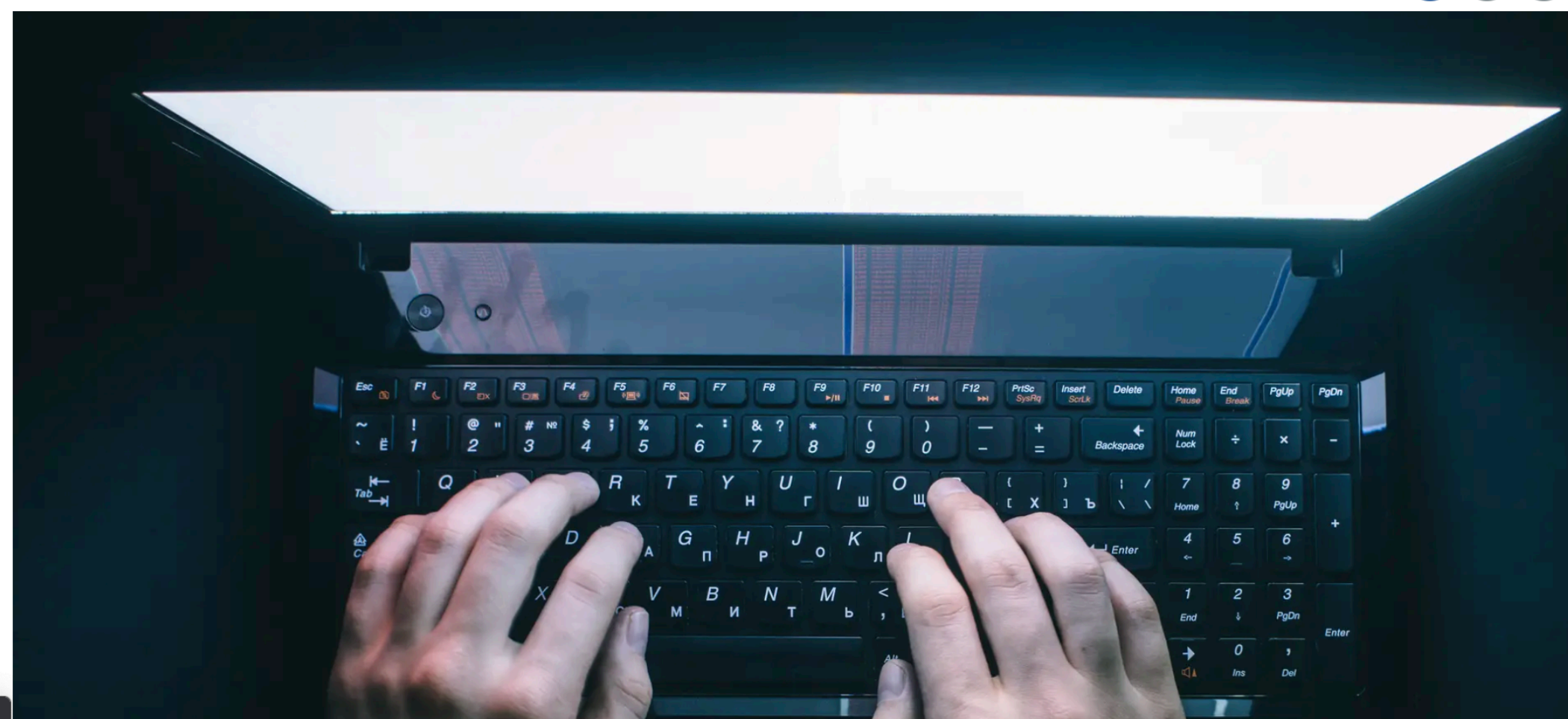
# The Jeff Huang Method

▸ Article

  ▸ https://www.businessinsider.com/professor-brown-single-text-file-to-do-list

  ▸ also here: https://jeffhuang.com/productivity_text_file/

▸ Discussion on Hacker News

  ▸ https://news.ycombinator.com/item?id=22276184

# Cal Newport

▸ Georgetown CS professor

▸ Wrote many books

  ▸ study techniques, productivity, distraction/focus

▸ Study Hacks Blog

  ▸ https://www.calnewport.com/blog/

▸ Thoughts on time management system

  ▸ https://www.calnewport.com/blog/2018/02/02/on-simple-productivity-systems-and-complex-plans/

# Time Management System



- ‣ Find a system that works for you!

    - ‣ there is no "best" system

    - ‣ the key is that you can use it **consistently**!

    - ‣ try a system & switch if it's not working

    - ‣ at some point you'll fail to use it; that's OK try again
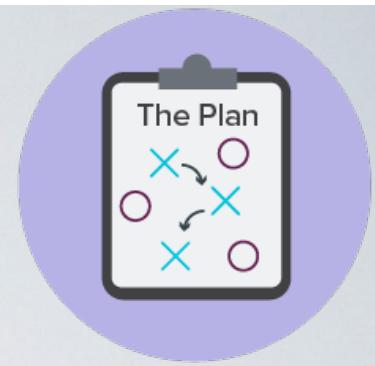
# Time Management System



▸ Why are they so important?

    ▸ make you more productive

    ▸ make you more efficient

    ▸ make you feel more in control

    ▸ make you *less stressed and anxious*!

# Time Management System

‣ What system do *you* use?

# Learning Plan

- How do *you* plan to learn this material?

- Learning doesn't happen by "absorption"

  - it happens by *doing* and by *failing*

- How are *you* going to use Lectures?

- How are *you* going to use Section?

- How are *you* going to use HWs? Projects?

- How are *you* going to use Exams?

# Learning Plan

- ▸ In 16 we provide a basic structure for you

  - ▸ Lecture, Section, HWs, projects, Exams

  - ▸ but this won't always be the case

- ▸ You should have your own learning plan

- ▸ How will you make use of the resources provided?

# Learning Plan

▸ What is your learning plan?

# Study Strategies

- How do you learn hard material?

  - do you just attend lecture?

  - do you use lecture capture?

  - do you read the book/slides?

  - do you simulate algorithms on small examples?

# My Study Strategy



- Junior year, a friend explained how…

    - …the top student in multi-variable calculus worked

    - It changed my life!

- After every lecture

    - he *wrote* his own notes for the lecture

- Before every exam

    - he *wrote* his own notes for the sections covered

- Writing my own notes helped me

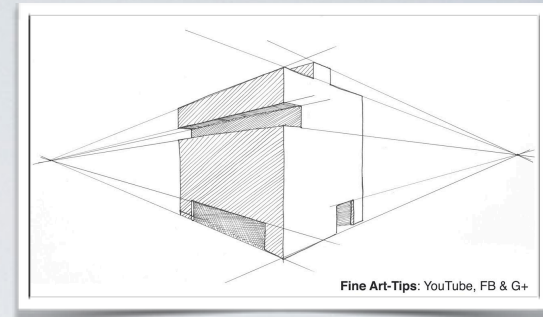    - *learn* material much better, *debug* my mis-understandings, *remember* material much better

# My Study Strategy

‣ It's time consuming but…

  ‣ …for me totally worth it!

  ‣ reuse notes when you forgot something

  ‣ reuse notes to study for final/exams

‣ I still do this today!

  ‣ *Everyone* I know that works w/ hard material does this

# Study Strategy

▸ What strategies do *you* use?

# Perspective

- ‣ What % is CS16 in your career as a CSist?

- ‣ You'll be working for the next 45 years!!

- ‣ What's the worst-case scenario?

  - ‣ a C? plenty of students w/ Cs in 16 go on to do great

  - ‣ an NC? take it again!

- ‣ What's *your* plan for *your* worst-case scenario?