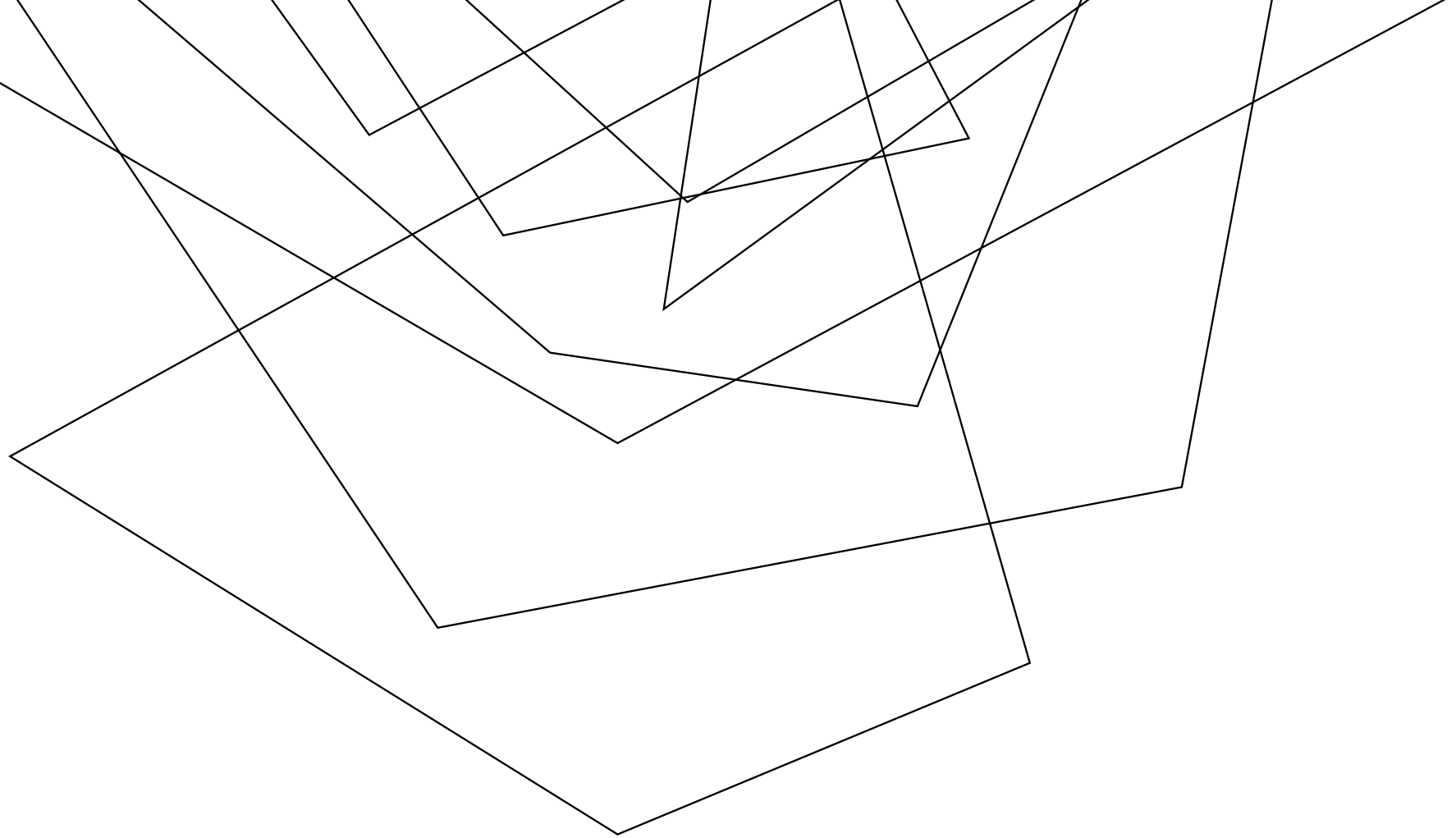
EXERCISE #1

BASELINE KNOWLEDGE REVIEW

Write your name and answer the following on a piece of paper

(I have paper for this class only)

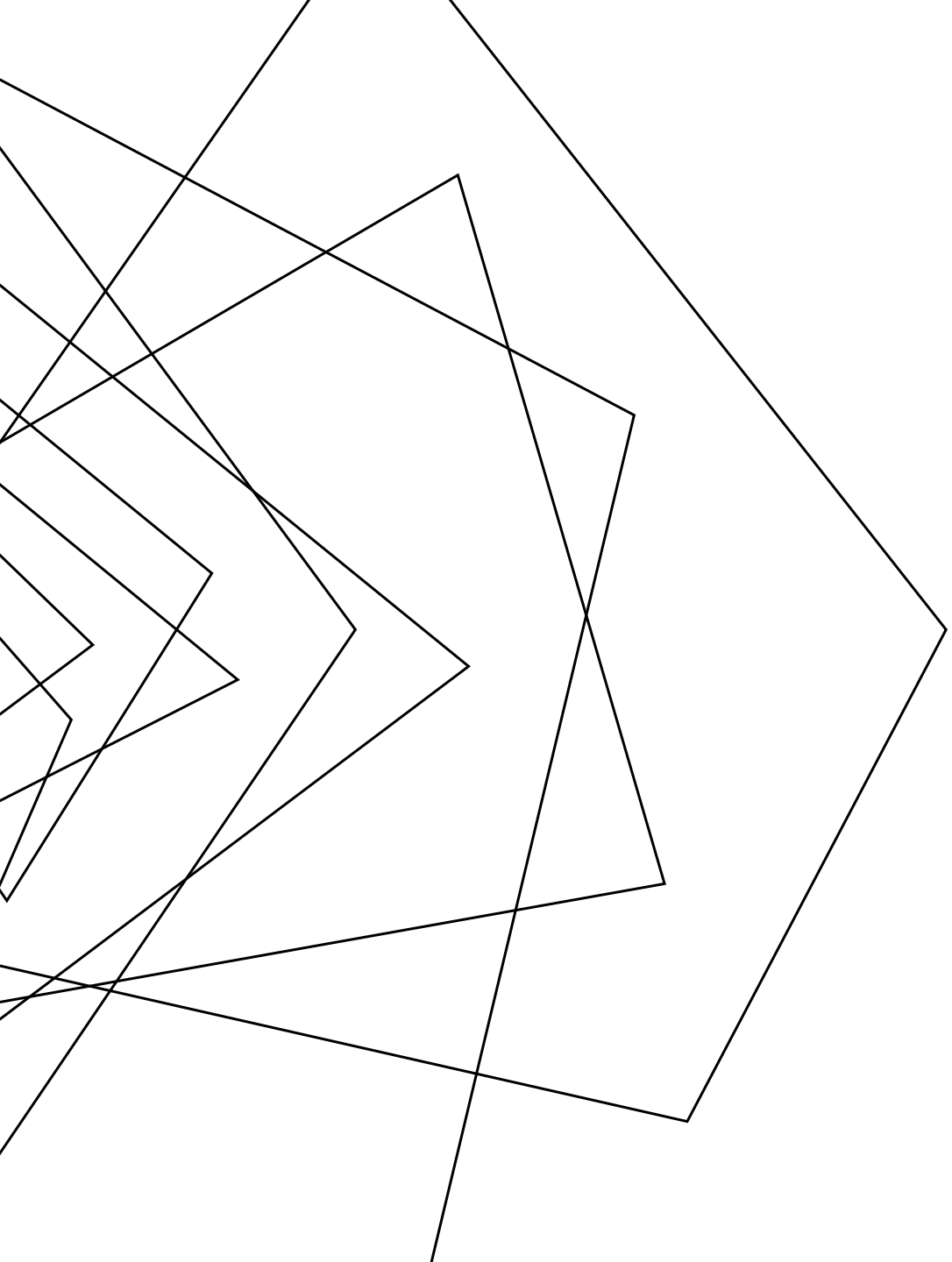
- What is a buffer overflow attack? What are the consequences of such an attack?
- What is static analysis?
- In computer security, to what does the CIA triad refer?



OVERVIEW

EECS 677: Software Security Evaluation

Drew Davidson



FAST FACTS FROM THE JUMP

I'M RECORDING THIS LECTURE

I'LL POST THE VIDEO AND THESE SLIDES ON THE CLASS WEBSITE

ADMINISTRIVIA AND ANNOUNCEMENTS

ASSIGNMENTS

Entry Survey

- Out **now**
- Due tonight at 11:59 PM on Canvas

Exercise #1

- If you're here, you just got 100%
- If you missed this class, due on Sunday at 11:59 PM
- In the future, you'll need to bring your own pencil + paper

TODAY'S ROADMAP

Orientation

- About me
- About you
- About the course

Evaluating Evaluation

ABOUT ME

(Associate) Professor Andrew “Drew” Davidson

Pronouns: he/him/his

THE JOB OF A PROFESSOR

ABOUT ME

The actual start of my job offer letter from KU:

Dear Drew

We are delighted that you will be joining the Department of Electrical Engineering and Computer Science (EECS). The terms and conditions of your appointment are set forth in your official offer of employment from the University. This letter provides details and expectations specific to your academic unit.

Responsibilities

Distribution of Effort (FTE).

The 1.0 FTE for this initial appointment is distributed as follows:

0.4 FTE Teaching/Advising
0.4 FTE Research
0.2 FTE Service

I'M A MANDATORY REPORTER

ABOUT ME

https://civilrights.ku.edu/sexual-misconduct
I (like nearly all KU faculty and staff) am designated as a **mandatory reporters**.

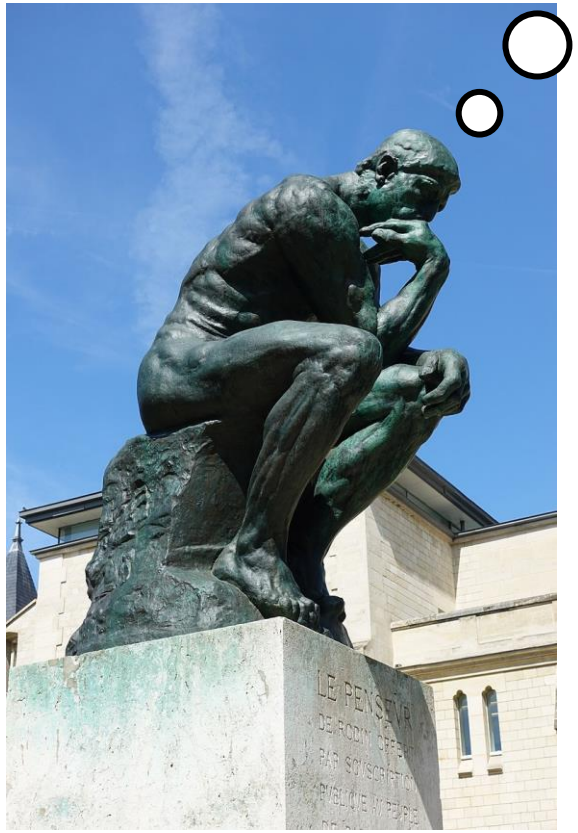
I'm required to report incidents of discrimination and sexual harassment, including sexual violence, to the Office of Civil Rights & Title IX.

The following positions **are not mandatory reporters** and can keep your information confidential:
CARE (Campus Assistance, Resource, and Education) Coordinator
785-864-9255 | care@ku.edu
KU Counseling and Psychological Services (CAPS)
785-864-2277 | caps.ku.edu
University Ombuds
785-864-7261 | ombuds@ku.edu

MY TEACHING PHILOSOPHY

ABOUT ME

How Teach?



Teach the class I'd like to take

- Treat your time as a valuable resource
- Avoid the annoyances I experienced as a student

Objectives – Teach a class that is

- Entertaining
- Enjoyable
- Informative ← *Most important*

"Like what?"

WHAT TO CALL ME

ABOUT ME

- **Preferred:** “Drew”
- **Ok:** “Professor Davidson”, “Dr. Davidson”
- **Never:** “Andy”, “Andrew”, “Mr. Davidson”, “Dr. Drew”

Dr. Drew (Extremely not me) [1]

[1]: Credit: www.podcastone.com/Dr-Drew-Show

INTERACTING WITH ME

ABOUT ME

(I think) **I am pretty friendly**

- I'll make an effort to learn every student's name
- If you see me outside of class, feel free to say "hi!"

I like when you visit office hours

- Appreciate when you come with a specific question

TODAY'S ROADMAP

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Evaluating Evaluation

THIS COURSE IS BUILT FOR YOU!

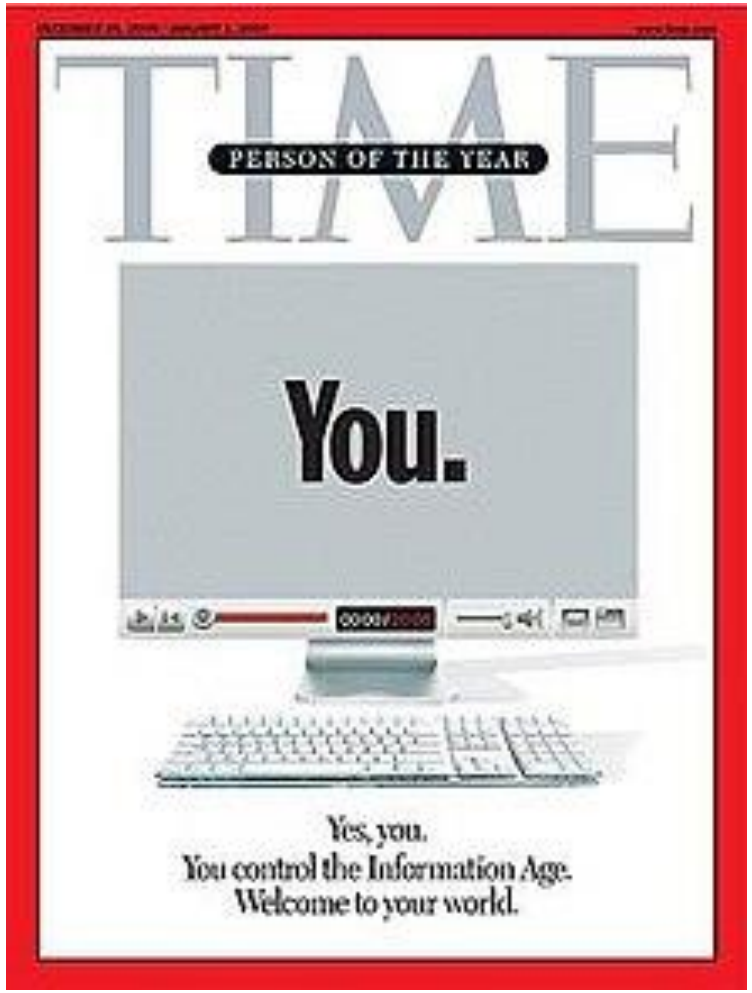
ABOUT YOU

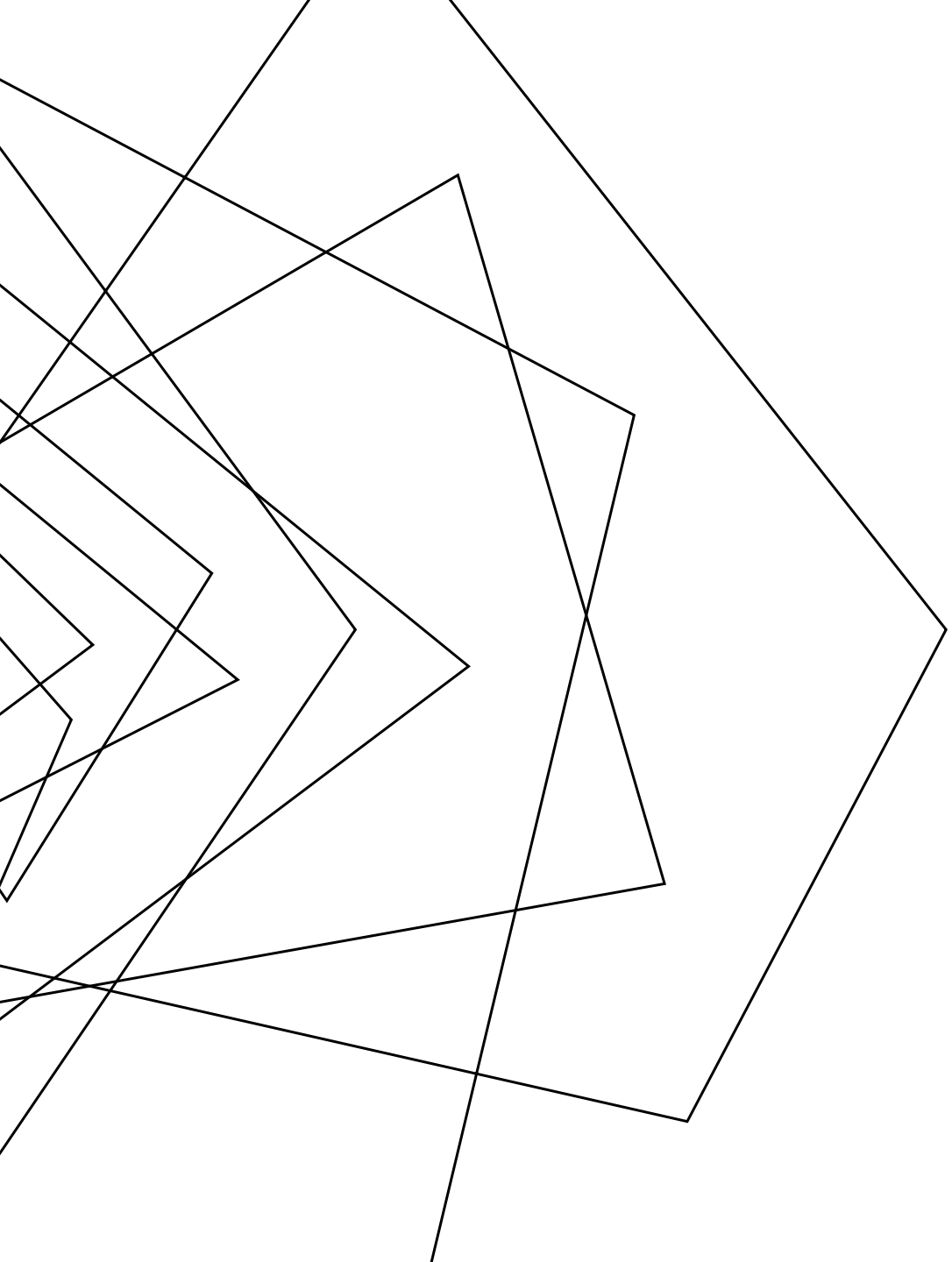
My effort is only as valuable as the result

- If you're having trouble, let me know!

I value feedback

- This course improves by matching your needs
- I encourage questions, comments, etc. (within reason)





CLASS COMPOSITION

67% UNDERGRADUATE STUDENT

33% GRADUATE STUDENT

COURSE ENTRY SURVEY

ABOUT YOU

To get a better sense of each student, I'm also asking you to complete a brief (private) survey

https://analysis.cool/survey

YOUR HYPOTHETICALLY ASKED QUESTIONS (HAQ)?

ABOUT YOU

IS DREW A GOOD TEACHER?

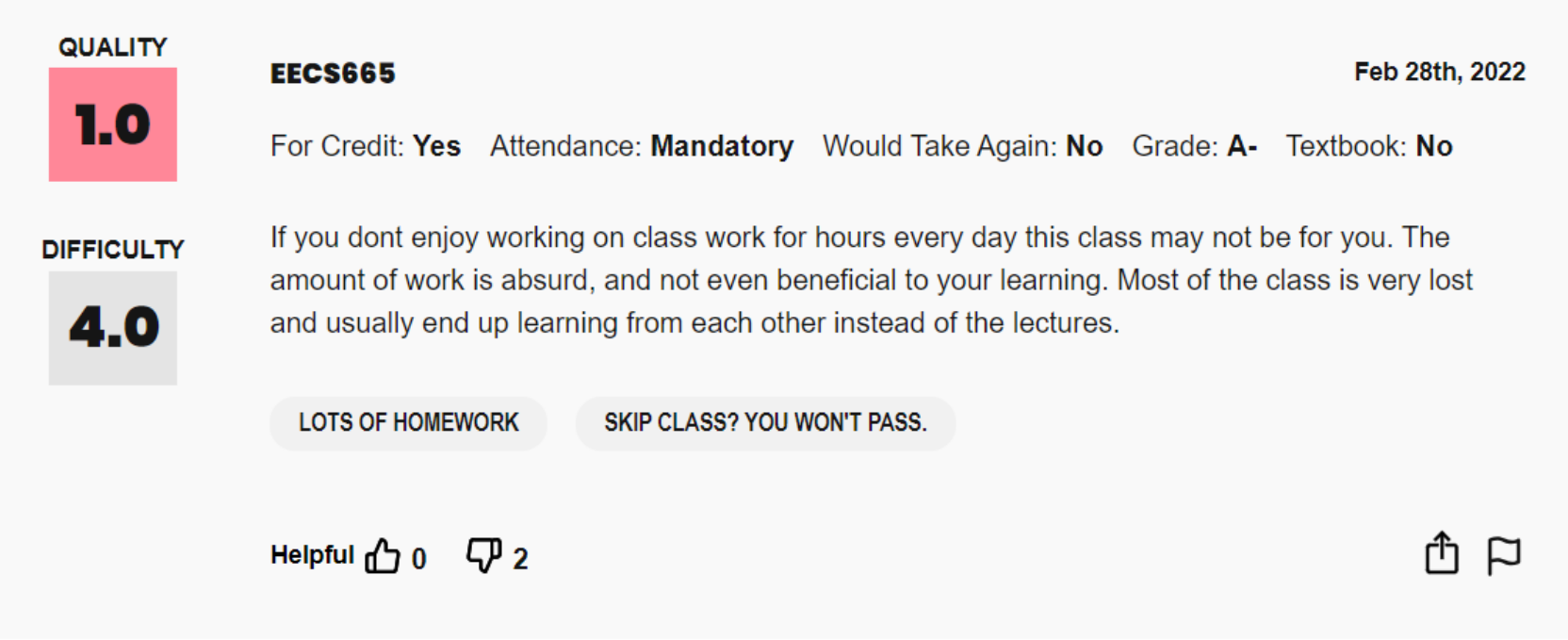
Maybe?

YOUR HYPOTHETICALLY ASKED QUESTIONS (HAQ)?

ABOUT YOU

IS DREW A GOOD TEACHER?

Maybe?



YOUR HYPOTHETICALLY ASKED QUESTIONS (HAQ)?

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Maybe?

IS THIS CLASS HARD?

Depends what you mean!

IS THIS CLASS HARD?

ABOUT YOU: HAQ

Depends on your definition of “hard”

“A Lot of work”

- I hope it’s a moderate amount of work

“Success is rare”

- Probably not

“Miserable”

- I want this to be “No”

“Conceptually Complex”

- I want this to be “yes”

Grade Breakdown

Survey - 1%
Quizzes – 39% (planning on 3 total)
Exercises – 10%
Homework – 50%

YOUR HYPOTHETICALLY ASKED QUESTIONS (HAQ)?

ABOUT YOU

IS DREW A GOOD TEACHER?

Maybe?

IS THIS CLASS HARD?

Depends what you mean!

DO I HAVE TO COME TO CLASS?

No!

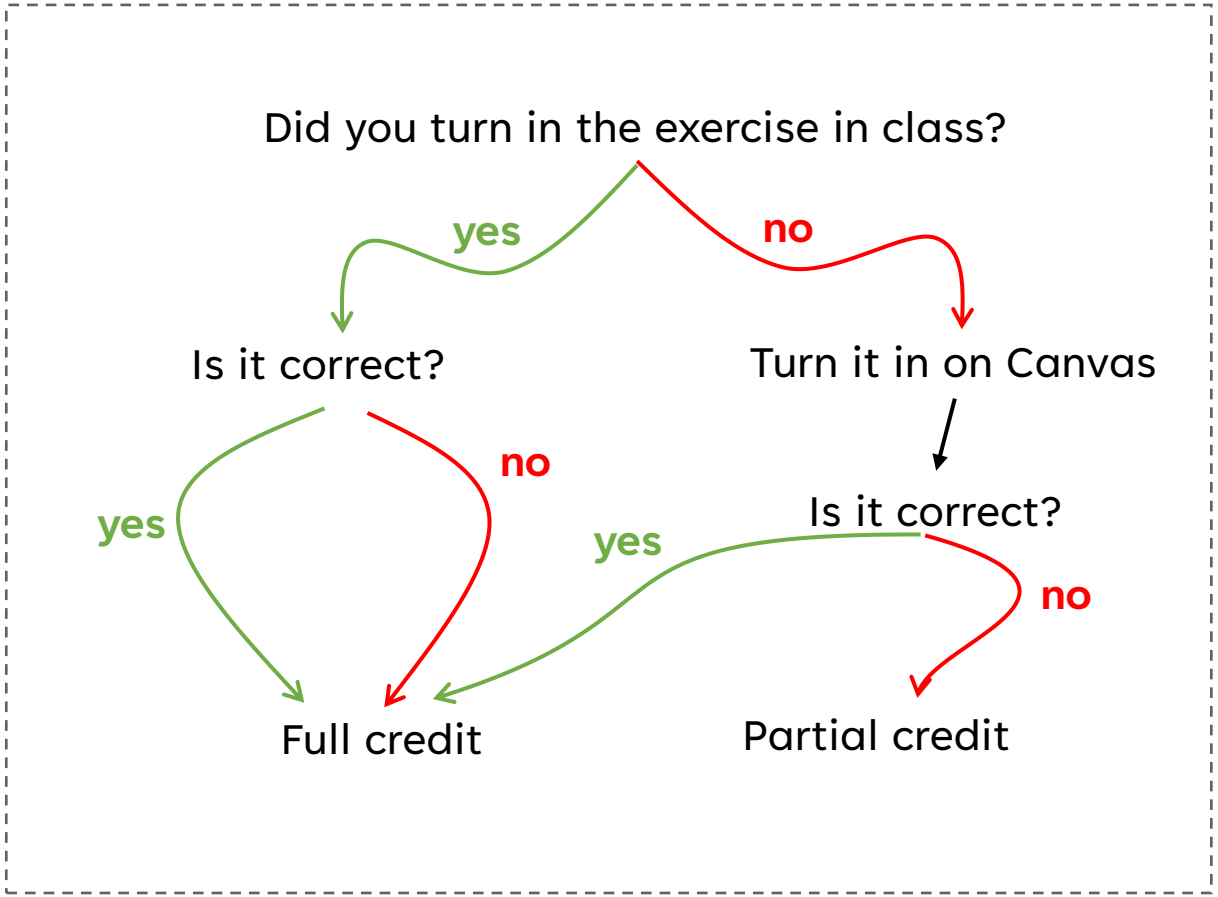
EXPECTATIONS OF YOU

ABOUT YOU

Attendance

- My assumption is that you will engage with this class
- Your attendance is rewarded, but not required

Exercises Decision Flowchart



EXPECTATIONS OF YOU

ABOUT YOU

Administrivia

- Class website: https://analysis.cool

  You're expected to read the website

- Piazza (link in syllabus and on website)

  You're expected to read Piazza

- Canvas

  You're expected to turn in assignments through canvas

EXPECTATIONS OF YOU

ABOUT YOU

Depends somewhat on the course you're in

- *EECS 677 vs EECS 777*

TODAY'S ROADMAP

Orientation

- About me
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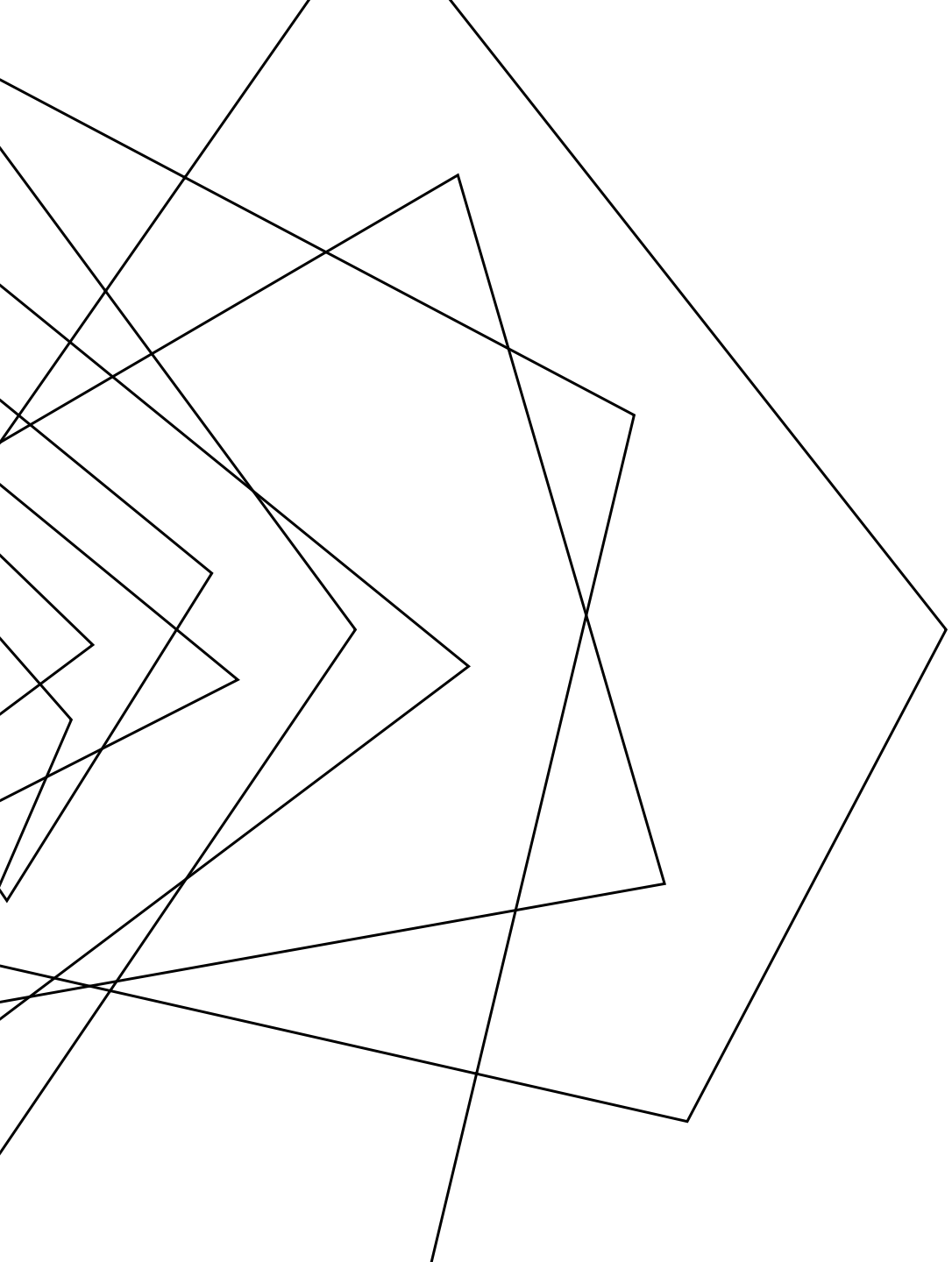
Evaluating Evaluation



COURSE TOPIC

TOOLS AND TECHNIQUES TO EVALUATE THE SECURITY POSTURE OF SOFTWARE AND WRITE MORE SECURE CODE

COURSE PERSPECTIVE

ABOUT THE COURSE

Security flaws are design flaws

- Limitations of the toolset / misuse of the toolset
- How do we evaluate and prevent issues?

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ABOUT THE COURSE

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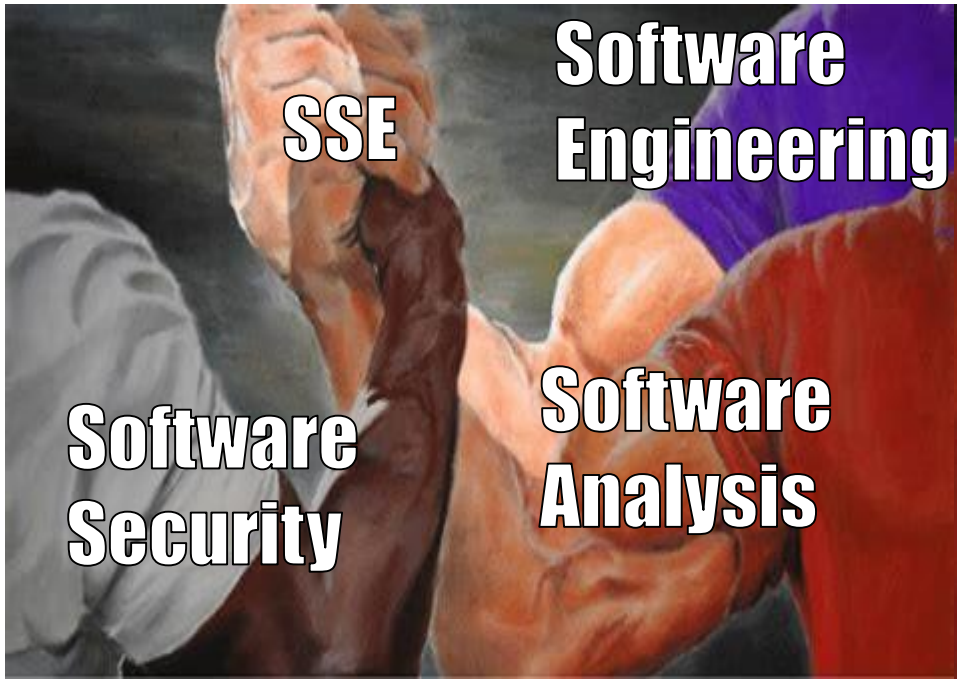

BASIC TOPIC BREAKDOWN

ABOUT THE COURSE

Secure Software Engineering

Analysis Techniques

Analysis Tools

TODAY'S ROADMAP

Orientation

- About me
- About you
- About the course

Evaluating Evaluation

ANALYZING SOFTWARE

EVALUATING EVALUATION

How the heck do we tell what software is doing?

"Simpler question: how the heck do we tell what software ***that we write*** is doing?

One answer: just be really, really careful when you write your code so you don't make any mistakes

Historically insufficient answer

Software, basically

LOTS OF OTHER PROBLEMS

EVALUATING EVALUATION

How do we describe programs at all (the source code is a specification after all)

Perhaps we simply detect the presence/absence of a particular set of behaviors
“Does this program send personal data to the network?”
“Does this program allow a user to inject code and run it?”

How do we actually detect the presence/absence of a program property?
Not immediately obvious, with some very disheartening realities!

TESTING AS ANALYSIS

EVALUATING EVALUATION

Most familiar form of program analysis:
Observation

Determine what is “supposed” to happen under some circumstance
Create an input specification and output specification
Run the program on the input specification, check against the output specification

Really good at proving the presence of some behavior!
Really easy to get started!

Really bad at proving the absence of a behavior!

ANALYZABLE PROGRAMS

EVALUATING EVALUATION

If we're even going to get started, we need an easy way to specify programs

- Boil down to the essential features of computation
- Something both human-readable and machine-readable

LECTURE END

Fill out the course entry survey

https://analysis.cool/survey

Read the syllabus

https://analysis.cool/syllabus

Sign up for Piazza