CLEMSON UNIVERSITY

CPSC 3720
Lesson 1:

Why Do I Need This?
+ Class Intro

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Professor of Practice

School of COMPUTING

Who is Professor Taylor?

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- https://www.linkedin.com/in/constanceltaylor

Why Did You Decide to major in Computer Science?

- Money
- Love programming
- Liked Math
- Enjoy using technology
- Like puzzles
- Job security
- Flexibility
- I was good at it
- My parents made me do it
- Didn’t have a better option
- I am a gamer and want to make games

Scan the QR or use link to join

https://forms.office.com/r/BDtAb7Xd-Px

Copy link

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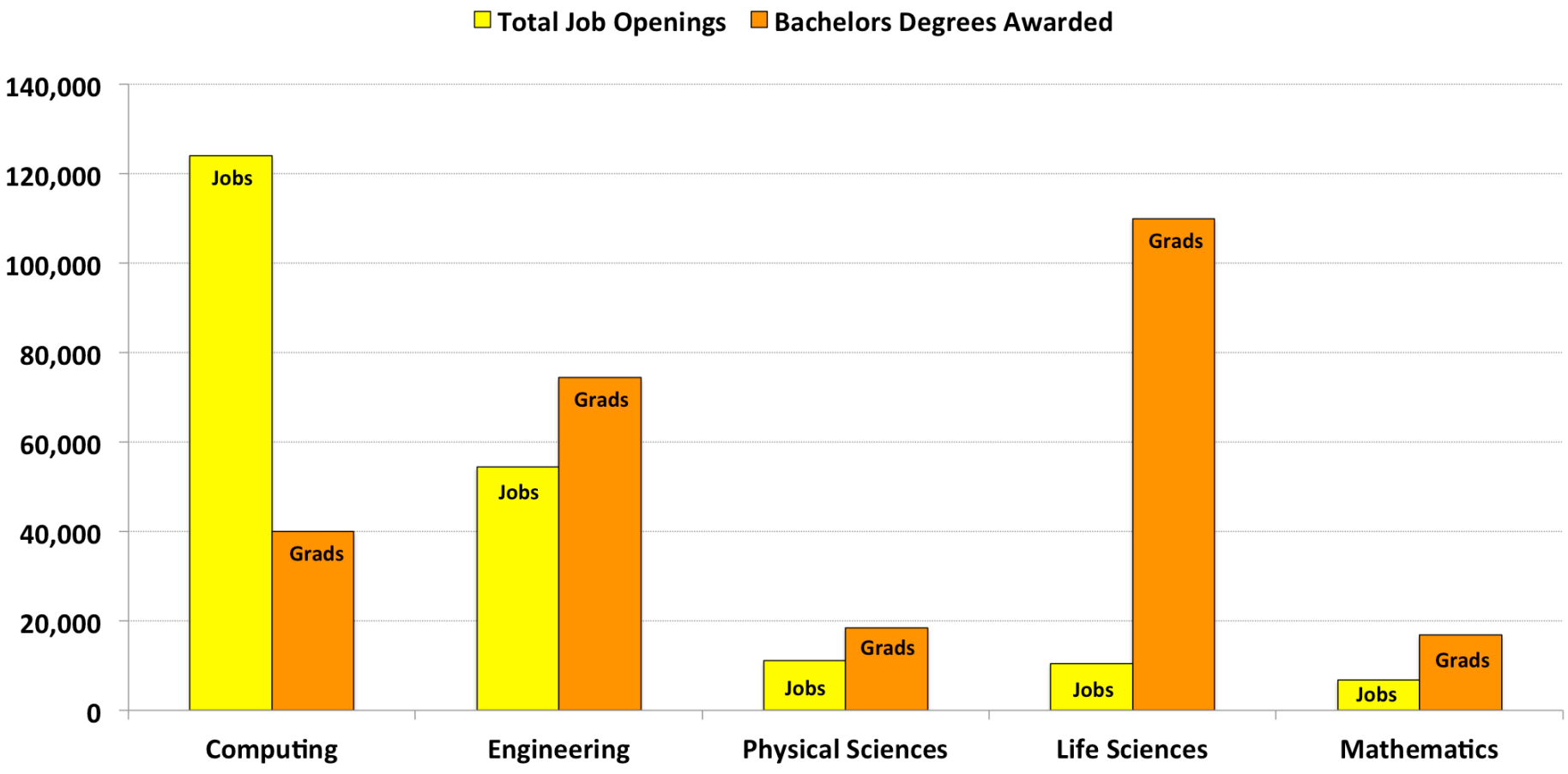
Pick the top 3 reasons you chose Computer Science as a major:

- Money
- Enjoy programming
- Like Math
- Enjoy technology
- Like puzzles
- Job security
- I am good at it
- Flexibility in my career
- My parents made me do it
- I didn't have a better option
- I am a gamer and want to make games

Regardless of reason, you made a good choice…



Data Sources: US-BLS Employment Projections, 2012-2022 (*www.bls.gov/emp/ep_table_102.htm*)
National Science Foundation NCSES (*www.nsf.gov/statistics/nsf13327/pdf/tab26.pdf, tab33.pdf, tab34.pdf, tab35.pdf, tab46.pdf*)

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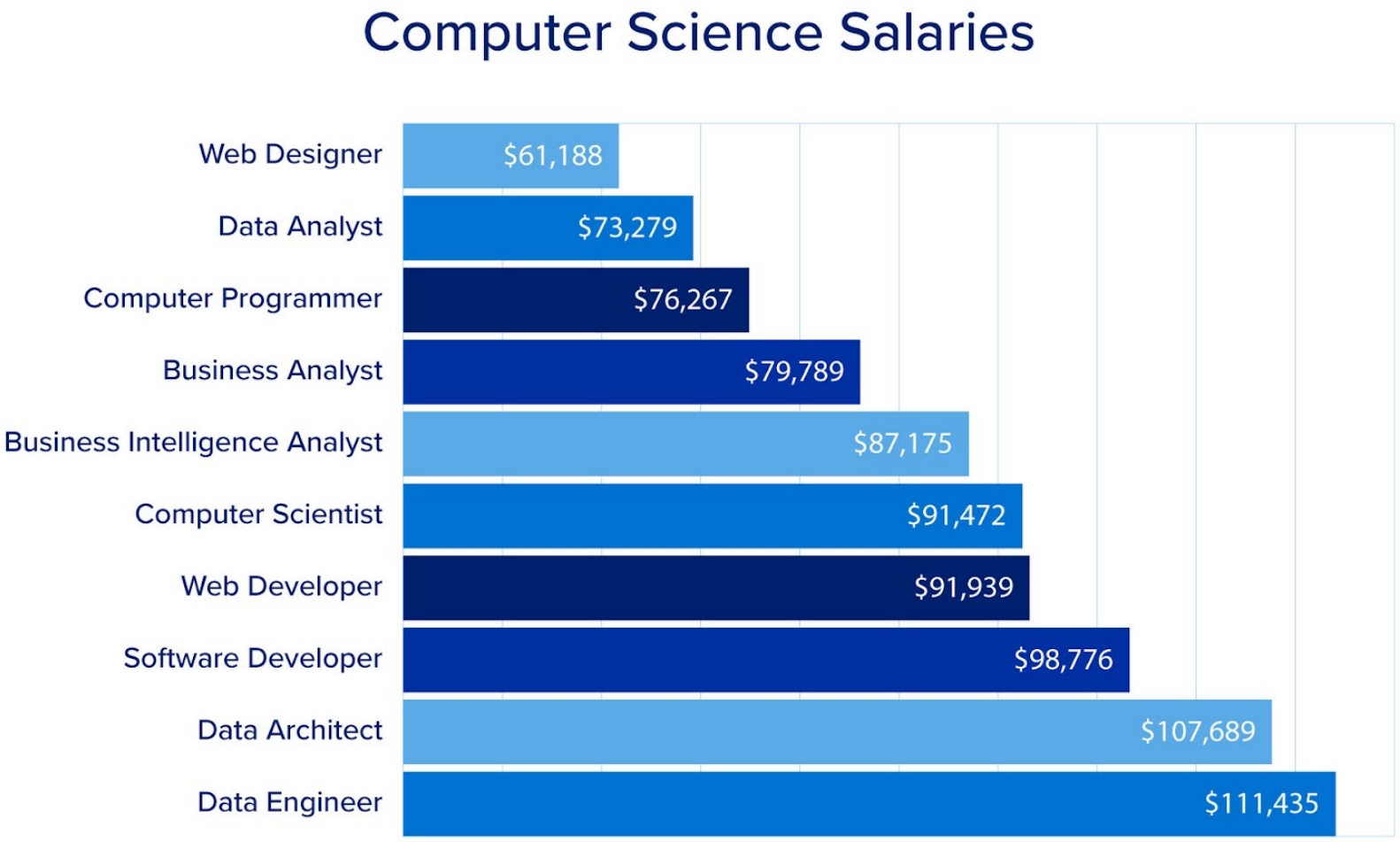
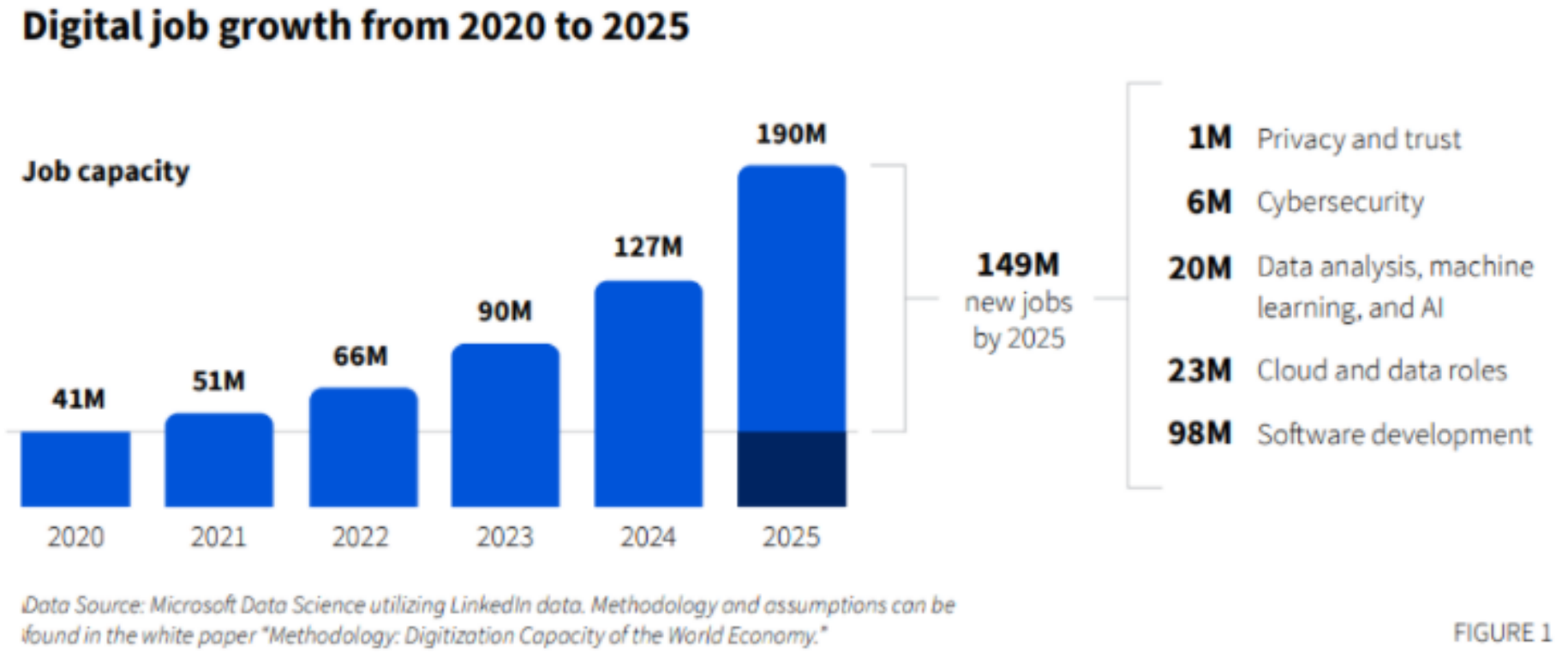


Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." (2022) http://www.burning-glass.com

Regardless of reason, you made a good choice…



Data Source: Microsoft Data Science utilizing LinkedIn data. Methodology and assumptions can be found in the white paper "Methodology: Digitization Capacity of the World Economy."

FIGURE 1

WITH
GREAT POWER COMES
GREAT RESPONSIBILITY

"With great power comes great responsibility"

- **You're responsible for the software you produce**
  - You want it to be high quality software
  - You need to verify your system does what is required
  - You need to ensure that the software is properly tested and maintained

- **Otherwise, you can have:**
  - Angry customers
  - Wasted money and time
  - Even worse – lost lives….

The Job of A Software Engineer/Developer

Software Engineer

Our mission is to develop products and technology that serve the needs of our diverse audience.What you will bring to the table is more than just your technical skills — your unique perspectives, ideas, and cultures will help us create better products and services.

What you'll do:

- Work closely with your team to design and develop features that will empower our users
- Measure and improve site performance and scalability
- Write well-tested code that is resilient to heavy iteration
- Manage individual project priorities, deadlines and deliverables.

What we're looking for:

- University and/or Higher Degree in Computer Science, Information Systems, or adequate
- Strong programming skills and verifiable mastery of at least one of the following languages: Java, PHP, Python, C/C++, C#, Ruby, Go, JavaScript, and TypeScript
- Ability to work independently and in groups

Benefits:

- Competitive salary
- Flexible work hours
- Investment in growth and education

Instead of filling specific needs, we hire talented engineers first and then work with them to map out areas of potentials and growth. **Apply Now!**

Other Roles for Computer Scientists

At your tables

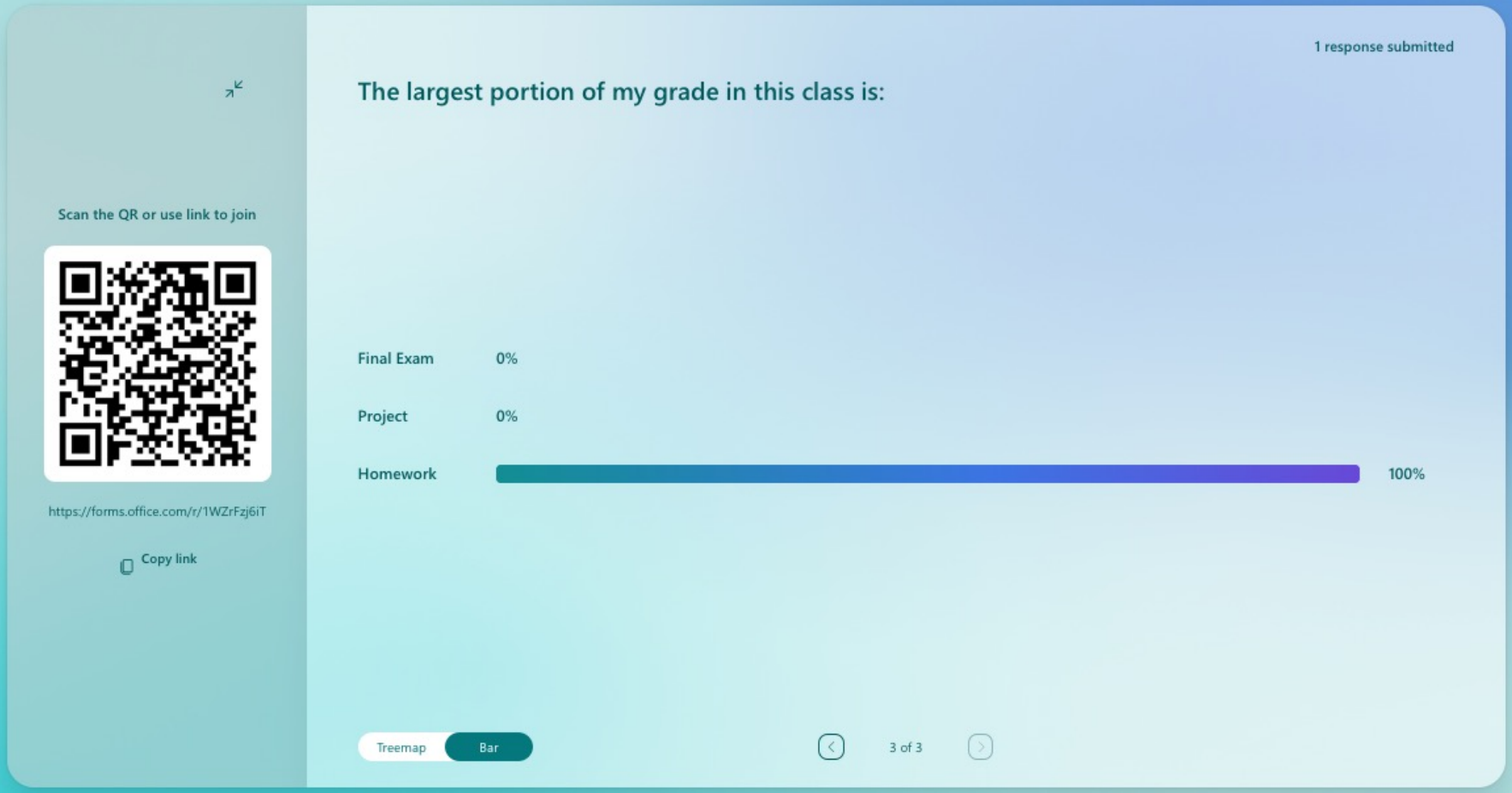
List more job types/roles for computer science majors and discuss which one you find most appealing and why?

How will this class help you in whatever role you want?

- Learn about software development in “the large”
- Understand what it really means to build and deliver software (hint: it is not just about writing code)
- Learn and use modern and relevant technologies
- Work in a team on an Agile project

Syllabus Review

Syllabus Quiz



What are these logos for?

1 

2 

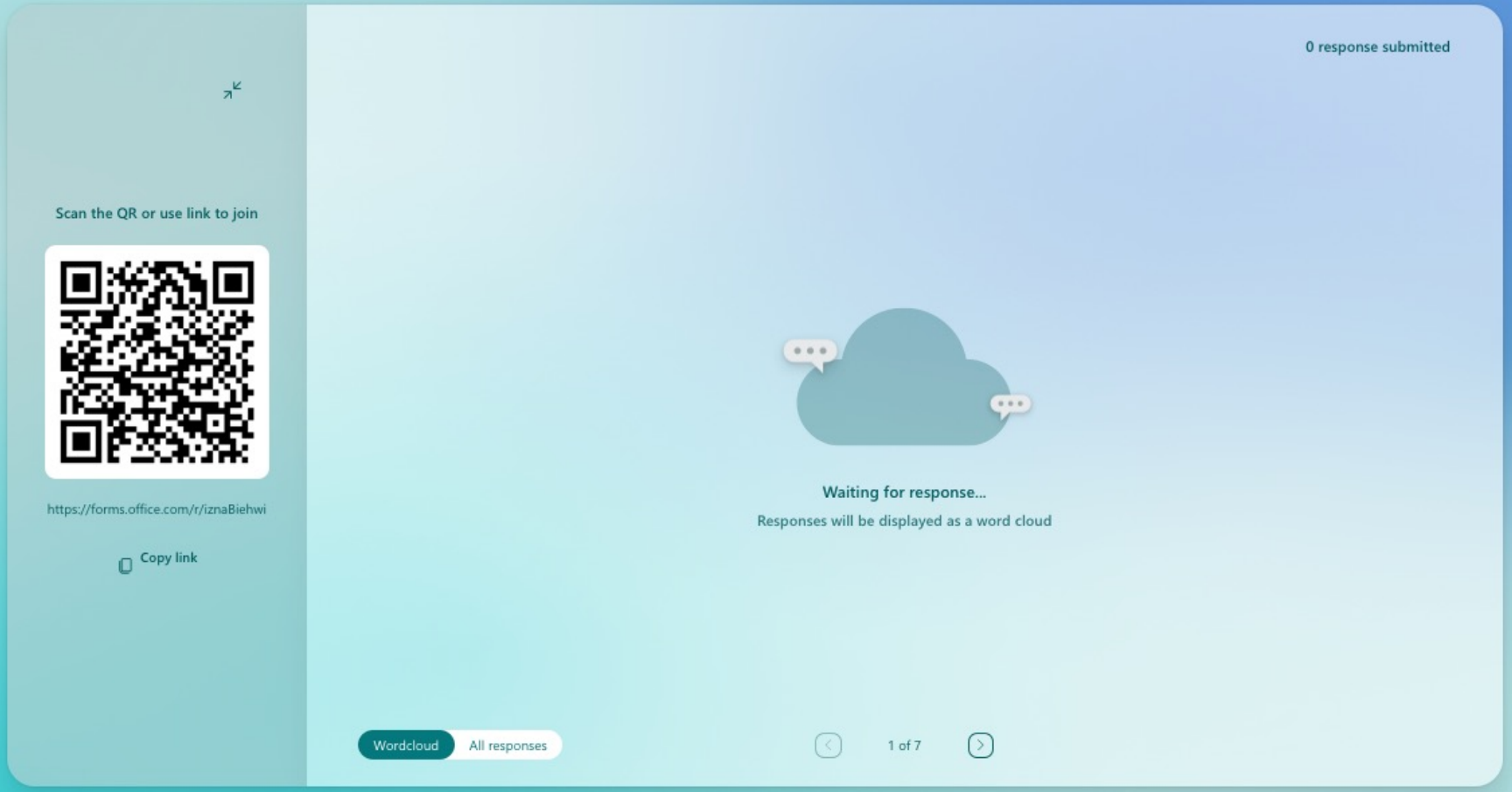
3 

4 

5 

6 

7 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Copy link
Waiting for response...
Responses will be displayed as a word cloud
Wordcloud
All responses
1 of 7

How to be Successful in this class (and your career)

- Be **present**
- **Pay attention** to lessons
- **Do the work** (reading and homework**)**
- Be a **team player**
- **Ask questions** to understand
  - Take advantage of office hours!

Software development is hard

- Can’t model it
- So many permutations in design, dev, testing
- Large, complex, software systems have many independencies

How do you ensure a successful software project?

What do you think is the most important factor in software project success?

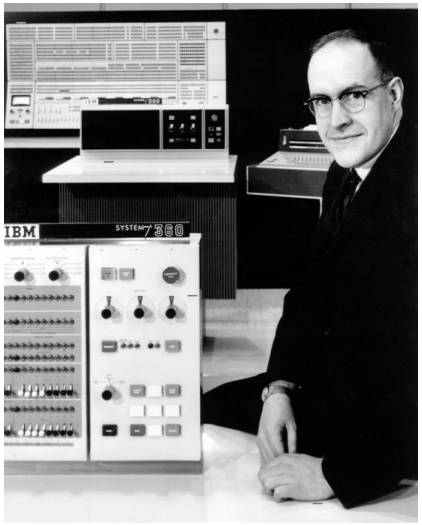
History of Software Engineering

The Pioneering Era
1955-1965

The Stabilizing Era
1965-1980

The Micro Era
1980-2005

The Cloud Era
2005-now



The Pioneering Era 1955-1965

- Software programs had to be rewritten to run on new machines that were coming out every year or two.
- Programmers did not have computers on their desks and had to go to the "machine room" to run the software
- Software programs were run by
  - signing up for machine time or by operational staff.
  - putting punched cards for input into the machine's card reader and waiting for results to come back on the printer.
- Software would have to be rewritten to meet the needs of new machines; this led to the need of high-order languages like FORTRAN & COBOL

Making predictions of a project's completion date was almost impossible. Why?

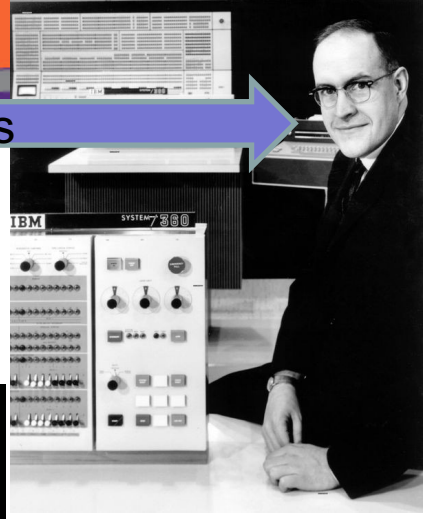
The Pioneering Era
1955-1965

https://youtu.be/FMXT4f8C63A

The Stabilizing Era
1965-1980

- The **IBM 360** signaled the beginning of the stabilizing era. It combined scientific and business applications into one machine.
- Software people could finally spend time writing new software instead of rewriting the old.
- The notion of timesharing, using terminals at which jobs could be directly submitted to queues of various kinds was beginning to emerge. Programmers still had to go to the "machine room" and did not have computers on their desks.
- As the software field stabilized, software became a corporate asset and its value became huge.
- "Structured Programming" burst on the scene in the middle of this era.

The Stabilizing Era
1965-1980



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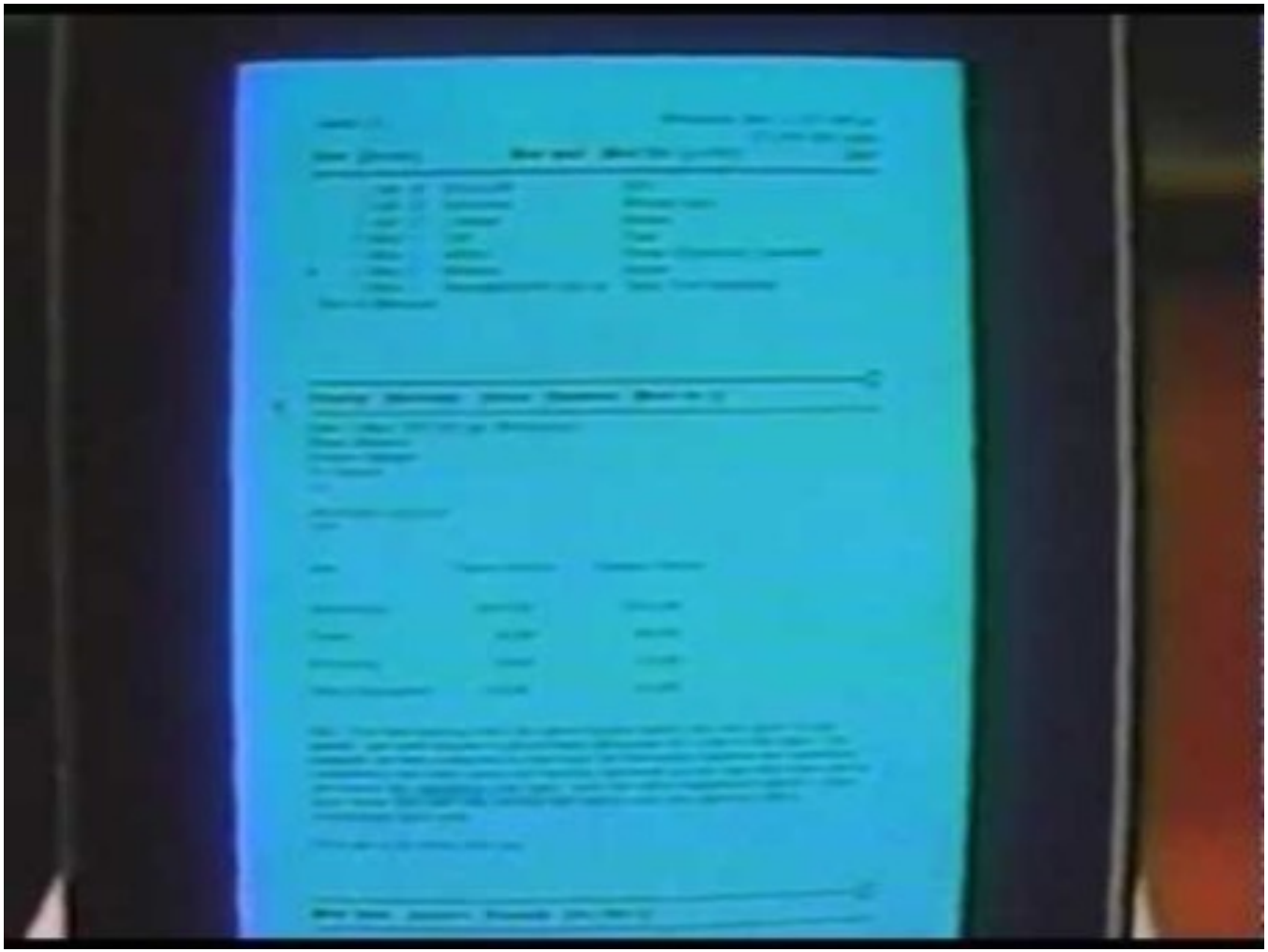
The Micro Era
1980-2005

- The price of computing has dropped dramatically making ubiquitous computing possible.
- Every programmer can have a computer on his desk.
- The user-friendly GUI replaces command prompt and job control languages.
- UNIX and Windows emerge as the prevalent Operating System.
- Many new higher-level languages emerge with Object Oriented languages leading the way.
- Software engineering discipline has matured.
- Applications as monoliths.

The Micro Era
1980-2005



https://youtu.be/M0zgj2p7Ww4

The Cloud Era
2005-Now

- Software is eating the world!
- Infrastructure moves to the cloud and then applications
- The age of the smartphone
- IoT emerges
- Huge amounts of data is stored in the cloud
- Data Science and AI emerge with the availability of data
- Applications evolve to microservices
- AI assisted software development….

Before Next Class

- Read “Software is Eating the World” by Marc Andreesen and complete assignment (see Canvas for details).
- Read The Mythical Man Month, Chapter 1 “The Tar Pit” by Fred Brooks and complete assignment (see Canvas for details).