COMP110

Introduction to *Programming*

Course Objectives

- You will learn the **fundamentals of programming**
    - These concepts are universal and apply to nearly all programming languages
    - You will leave knowing what it feels like to be a programmer
- You will gain practice with **computational thinking**
    - **Thinking algorithmically** while breaking down problems step-by-step
    - Thinking at varying levels of **abstraction** by describing problems and solutions abstractly and precisely
- You will understand what the field of **computer science** is about

Zero Programming Experience Expected

- This course assumes *no* prior programming experience
    - But some experience in COMP101 or AP CS Principles/A is just fine

- COMP110 is a ***rigorous*** introduction to programming.

What will you *do* in COMP110?

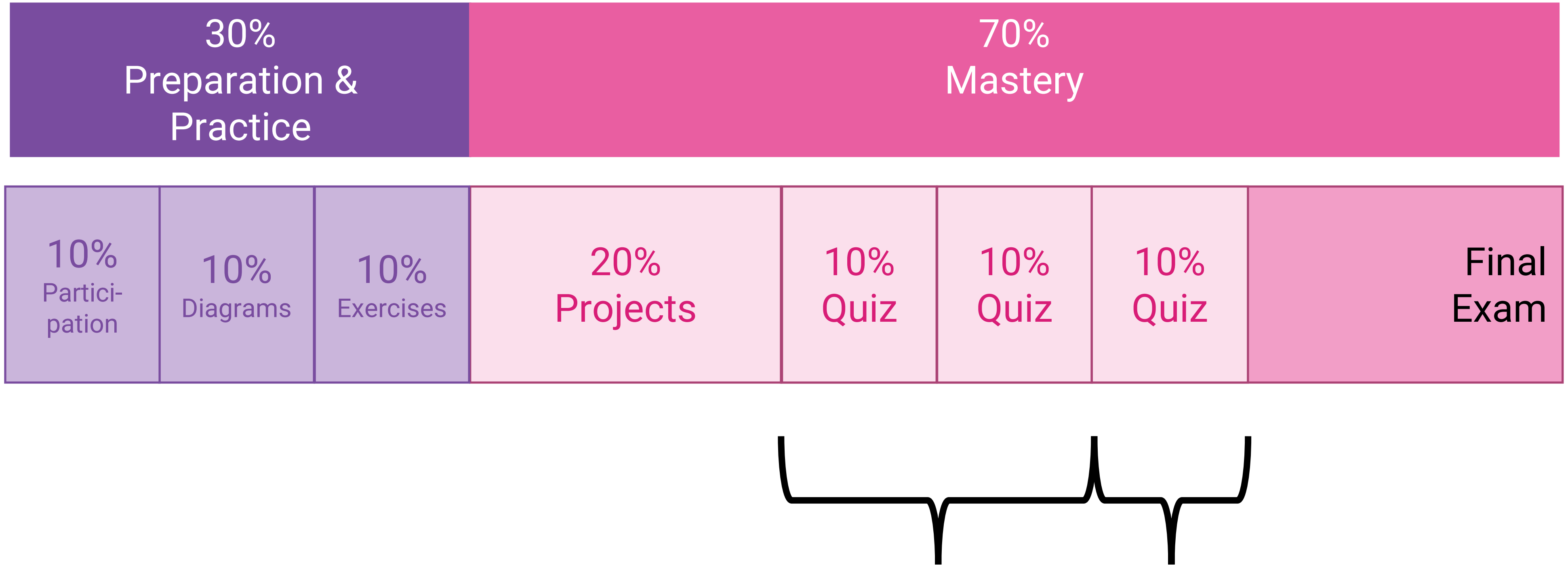
- **Prepare** - Actively Watch Assigned Videos and Review Notes
  - Like assigned readings in other courses except mostly video
  - You should take notes and engage as if it were lecture..
    ..you can use 1 page of handwritten notes on warm-up questions

- **Participate** - Synchronous Gatherings
  - Warm-up questions based on earlier concepts
  - Practice reading, diagramming, and writing code
  - Ungraded, challenge problems to dig into important concepts

- **Practice**
  - Environment Diagrams: Pen-and-paper evaluation of code just like the computer does
  - Programming Exercises: Small programming problems to practice fundamentals

- **Demonstrate Mastery**
  - Projects: 4x open-ended programming projects
  - Quizzes: 3x timed quizzes that involve environment diagrams and programming exercises just like the *Practice* component
  - Final Exam:

Grading Breakdown



30% Preparation & Practice

70% Mastery

10% Partici-pation

10% Diagrams

10% Exercises

20% Projects

10% Quiz

10% Quiz

10% Quiz

Final Exam

Taking 2 of 3 quizzes is required.

You may request absence, with notice, for one quiz.

The absence request form is on the syllabus.

<u>Final Exam</u>

Weight is 20% if you take 3 quizzes.

Weight is 30% if you are absent for a quiz.

To pass COMP110 you must have a passing grade overall, take 2 of 3 quizzes, and earn higher than a 40% on the final exam.

Collaboration Policy & Honor Code

We take honor code violations very seriously.
Understand the policy details on the syllabus.

Collaboration Policy – General Content

- You are **encouraged** to discuss ***general course concepts*** with anyone including students not in 110 and tutors.

- This includes reviewing:
  - Slides
  - Documentation
  - Example lecture code
  - Exam study guides

Collaboration Policy – Graded Assignments

- No collaboration with anyone in or out of the course is allowed on problem sets and worksheets.

- **The only permitted collaborators on problem sets are UTAs while they are working in their official capacity as a UTA.**

- What is collaboration?
  - Looking at/sharing, or letting someone else look at/share, your screen.
  - Talking about your code in a step-by-step fashion
  - Copying or sharing code with anyone else or from community websites like StackOverflow, Chegg, GitHub, or CourseHero.

Not all the time you spend is equally valuable to you...

Goal: Learn how to paint on your own.

Per unit time spent on these activities, which are most valuable to your growth?

1. Sitting in front of a canvas and painting yourself
2. Going to a painting class or watching Bob Ross and painting your own version
3. Having a one-on-one instructor talk you through nearly every stroke you make
4. Watching a friend paint and copying their every stroke
5. Watching Bob Ross while not painting alongside

Time that is a NET POSITIVE. Time well spent!

1. Sitting in front of a computer and programming yourself

2. Coming to class and actively engaging in the activities

Time that is NET ZERO.

3. Relying on a Teaching Assistants to get over road blocks

Time that is NET NEGATIVE. It feels good, but it's fake.

4. Watching a friend code and trying to mimic their work

5. Coming to class and NOT actively engaging with the activities

Programming is a Practiced Skill

- Like playing an instrument, painting, writing cursive letters, dancing, singing, sports, wood working, quilting, and so on....

Time spent *individually practicing* is the key to success.

- This is *very different* from courses that are knowledge-based!

- The team and I want you to succeed in learning how to program, so we structure everything we do toward helping you practice individually.

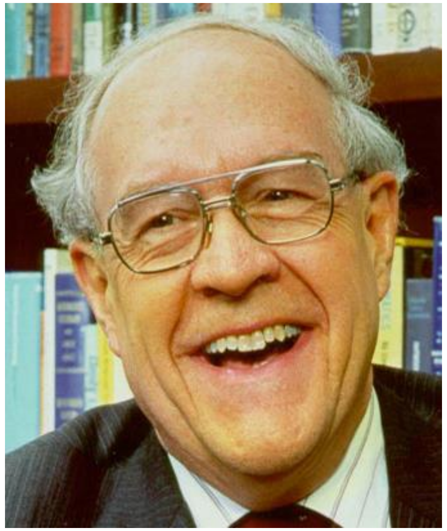
Computer Scientists
are
Toolsmiths

“The *programmer*, like the poet, works only
slightly removed from
pure thought-stuff.

(S)he builds castles in the air, from air,
creating by exertion of the imagination.

Few media of creation are
so *flexible*,
so *easy to polish* and *rework*,
so *readily capable* [...]”

Fred Brooks
Baller / O.G. / Founder of UNC CS Department



“Think...

Type...

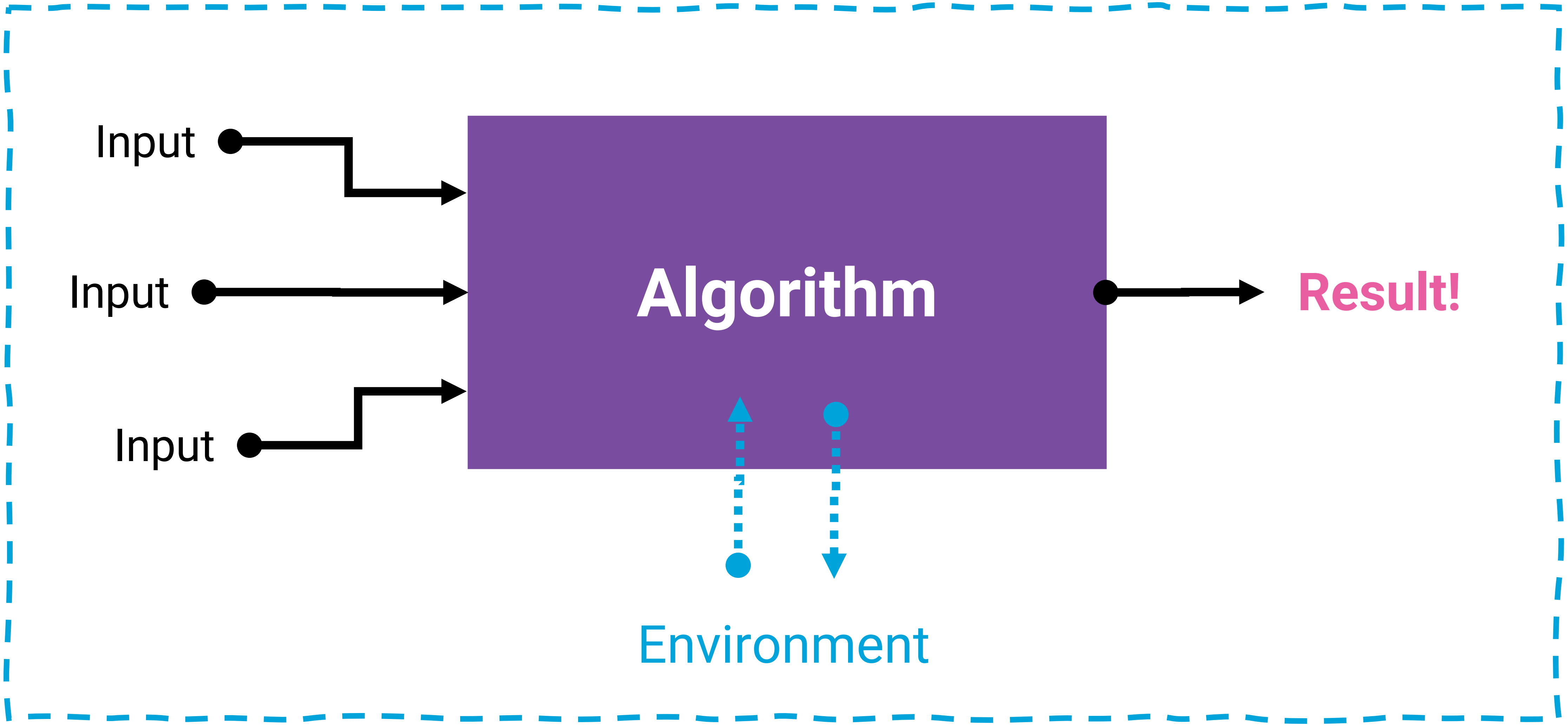
Magic Happens.”

Prof. Gary Bishop

& now for some…

Computer Science

The Fundamental Pattern



The Fundamental Pattern

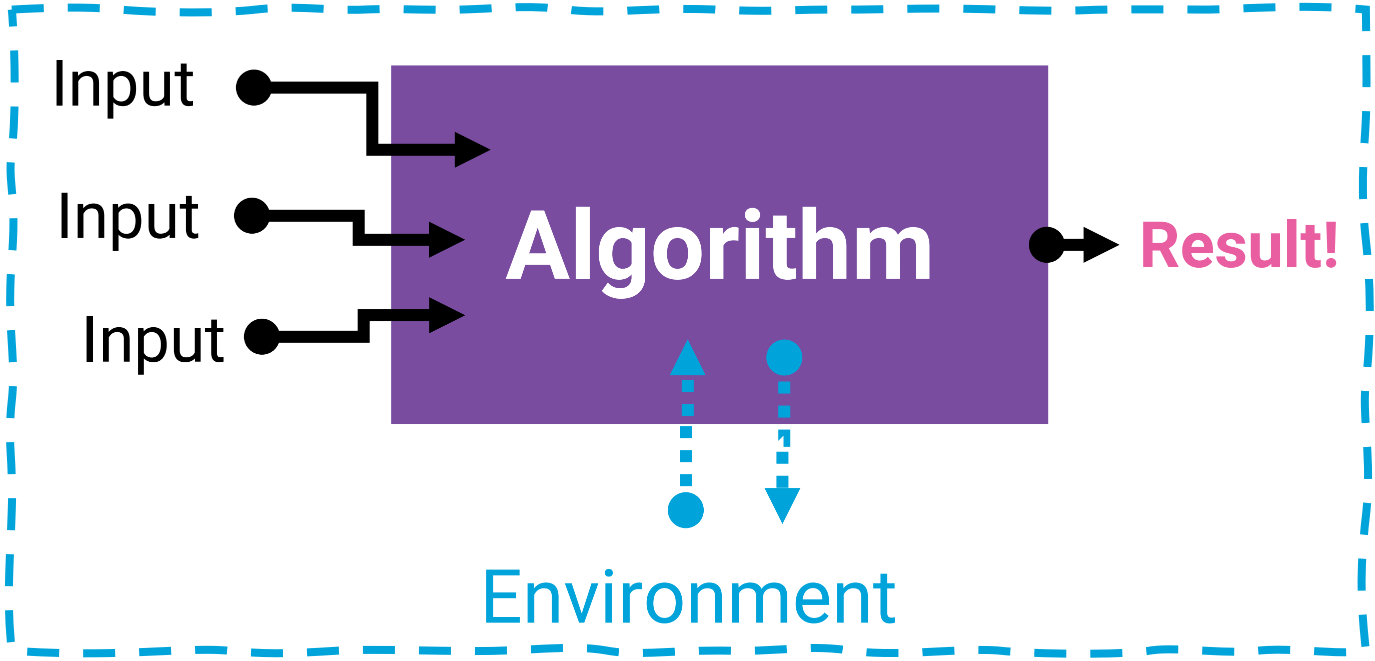
From the scale of **single lines of code** to **complete programs**, this pattern of thinking is pervasive

Input is data given to an algorithm

An **algorithm** is a series of steps

An algorithm produces some **result**

An algorithm *may* be influenced by the **environment** it is operating in and it *may* produce side-effects which influence its environment.



The Journey Ahead

Course Web Page: 20ss2.comp110.com

- Course Itinerary
  - Lessons
  - Videos
  - Exercises

- Resources

- Links to Getting Help

How-to Work on Exercises

- Start early. Start early. START EARLY!

- Read the instructions closely and follow them step-by-step:
  - They are written to help guide you through the assignment!
  - Do not skip around or try to move past a step before completing.

- Have open:
  - Lecture notes and slides for related topics
  - *Instructions for the assignment!*

- When you get stuck:
  - Stare at your code for a while. Look it dead in its eyes.
  - Take a break, take a walk, do something else.
  - See us in office hours!

- *START EARLY!!!*

The Struggle

- Programming is weird and different from almost everything you’ve ever done before.
- If you are feeling the “struggle” of working through problem sets – you are doing COMP110 right.
- Struggling through problem sets is expected. ***Everyone*** goes through it in the beginning.
- **Coming to *your own* understanding of concepts, independent of friends in the course, is THE ONLY way to do well.**

Homework - By Tonight

- Complete Exercise 00 - Getting Started
- In this Exercise you will:

1. Register for course services
2. Install required software
3. Establish your course workspace
4. Write and submit your first autograded program for COMP110

Things to know about exercise autograding...

- You can resubmit to the autograder without penalty before the due date

- If you do not get full credit - stop and think about what might be causing a test to fail. Try again!
    1. Style (Lint) Error? The autograder tells you the file and the line number that it believes the issue is on. Use this information to correct the style.
    2. Functionality Error?
        - Read the description of the failing test as it typically describes what it is looking for.
        - Read the output of the error message. This can be cryptic, but sometimes it offers hints.

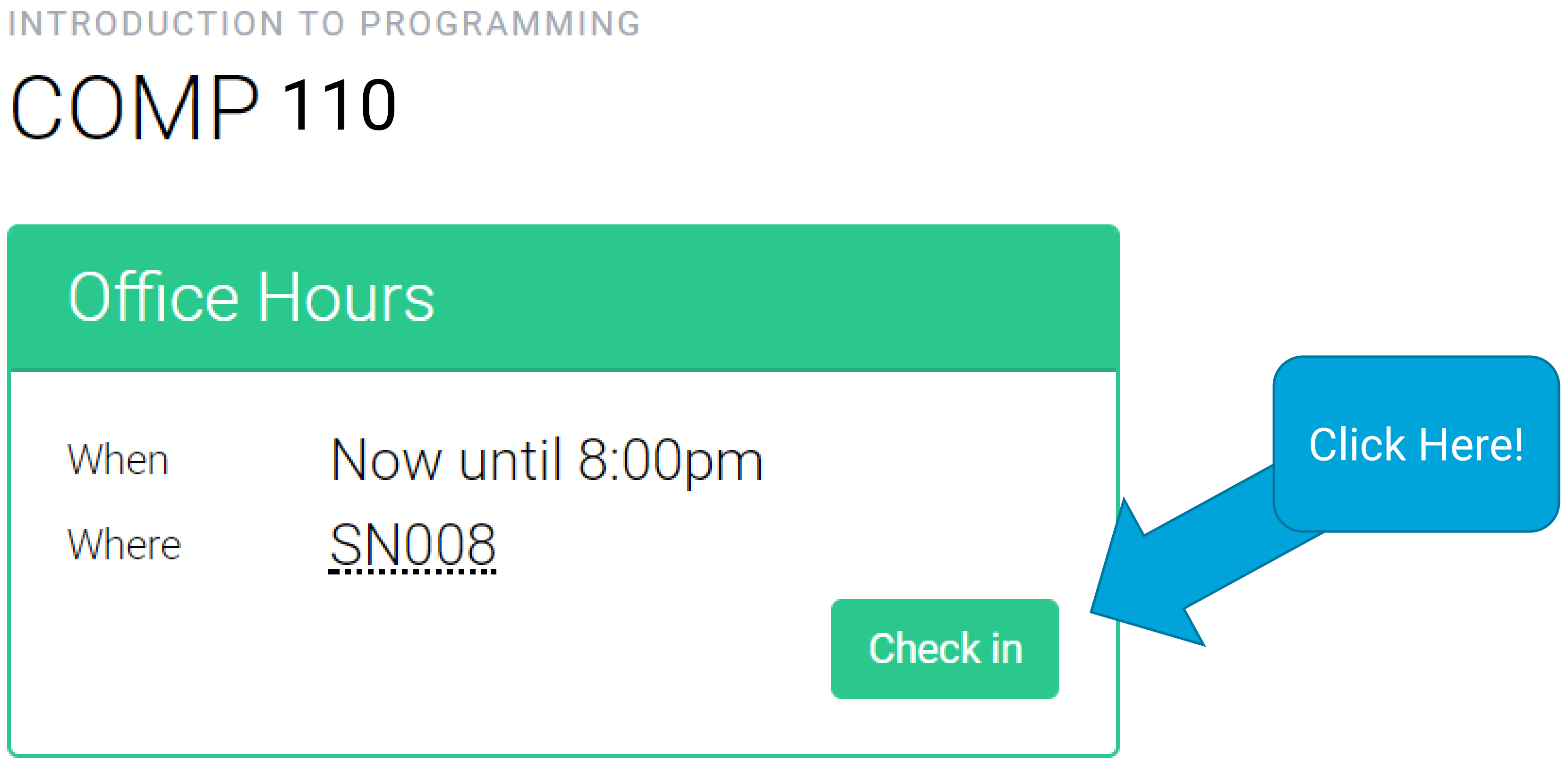
- Be careful to avoid a frustrating loop of "tweak one small thing, resubmit, tweak one small thing, resubmit, ..."
    1. See if you can reproduce the error on your machine locally with a test case!
    2. If you find yourself stuck in this loop, stop by office hours.

Office Hours for Help Getting Started

- Tonight from **5pm to 7pm**
- Get help installing course software

Office Hours Check-in Process

Click on "Get Help" on the course home page



INTRODUCTION TO PROGRAMMING

COMP 110

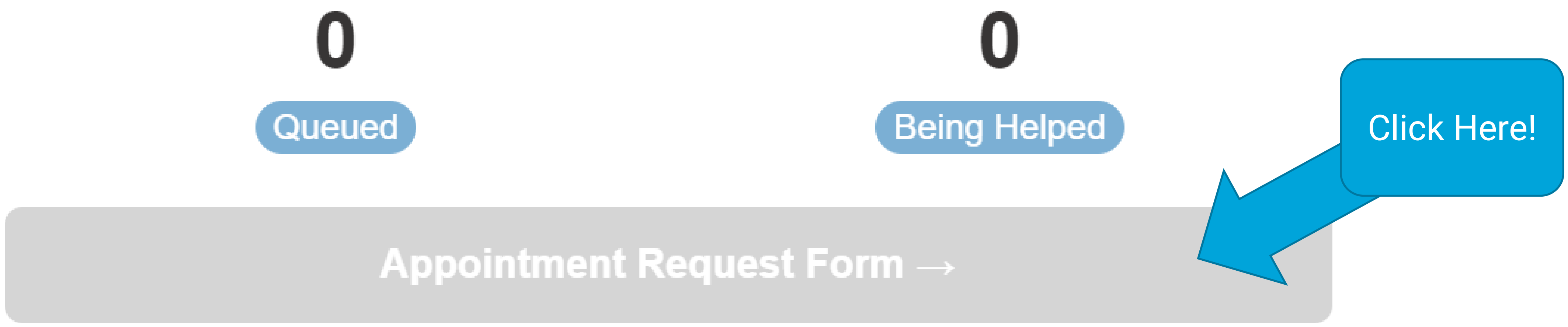
Office Hours

When Now until 8:00pm

Where SN008

Click Here!

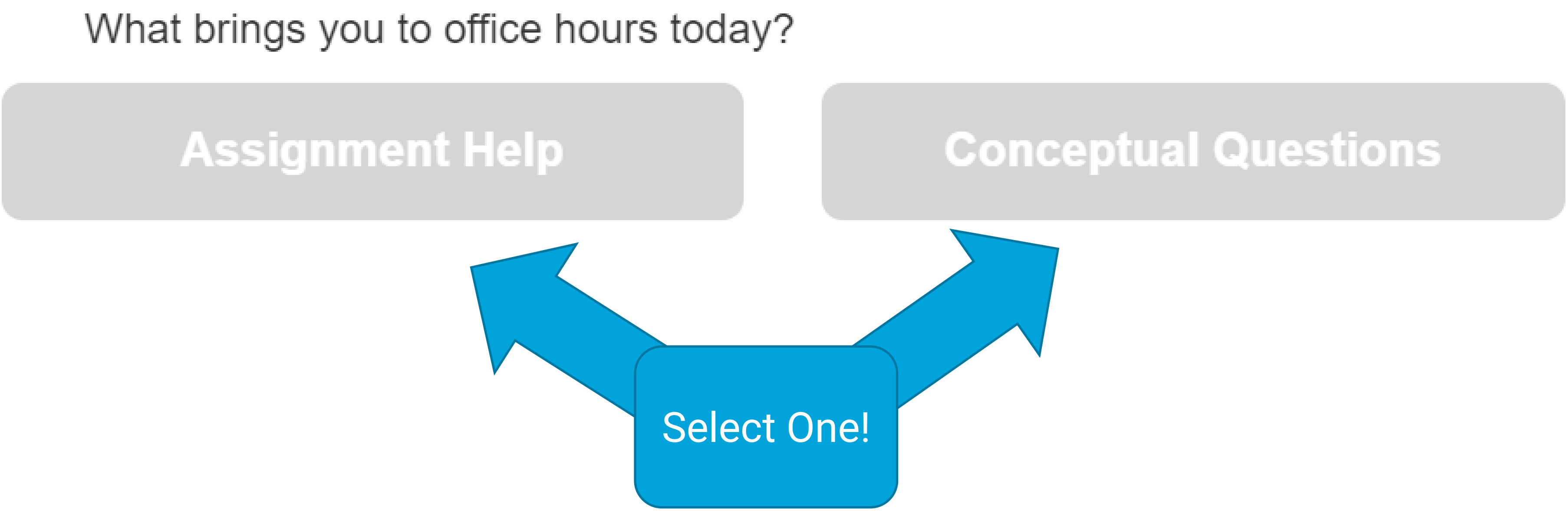
Office Hours Check-in Process



Click Here!

You can see how many people are currently waiting to be helped and currently being helped ahead of you.

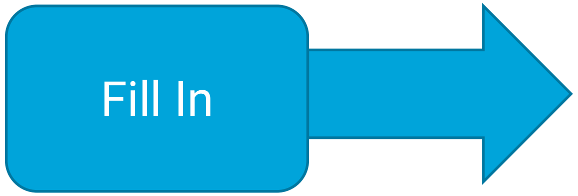
Office Hours Check-in Process



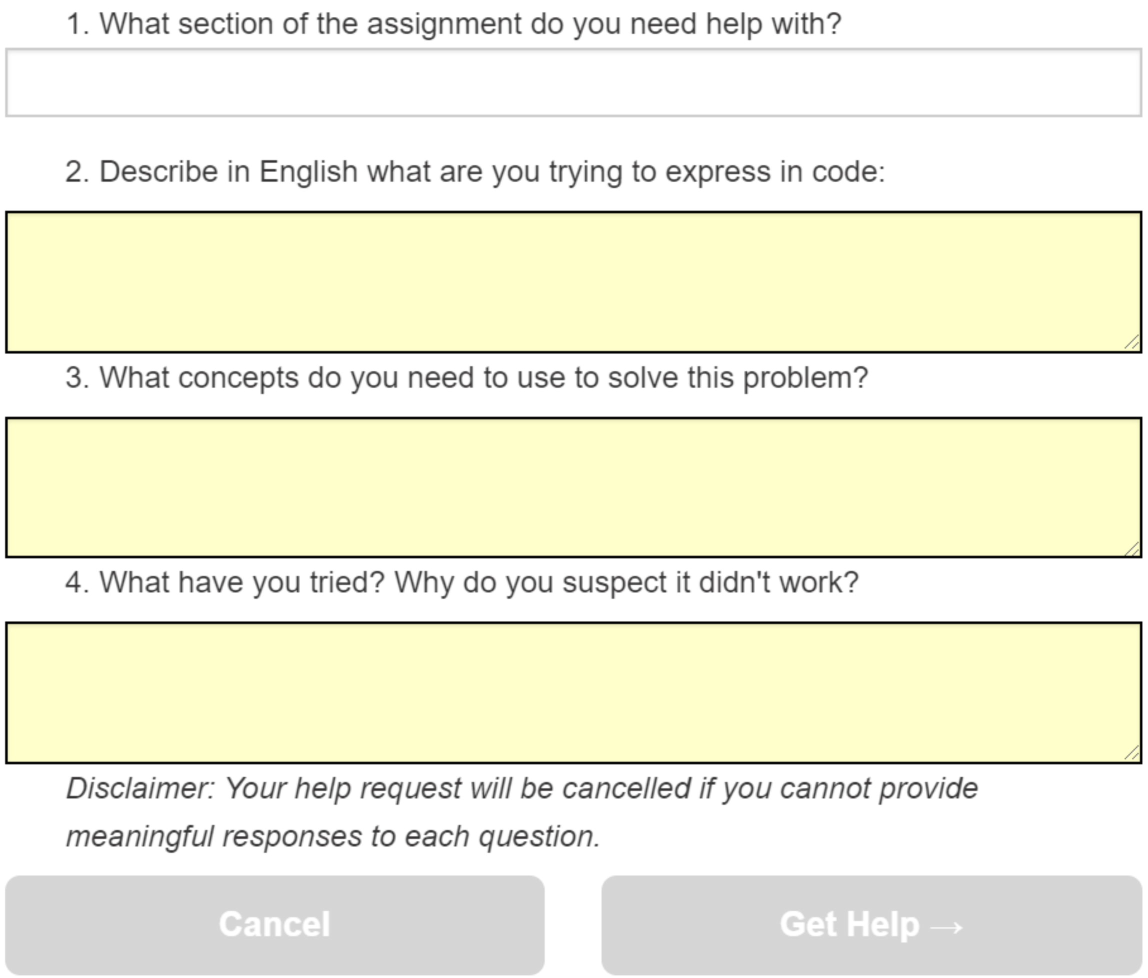
What brings you to office hours today?

Select One!

Office Hours Check-in Process



<u>IMPORTANT</u>: You must demonstrate effort and thought in these fields. If you do not, the TAs are instructed to cancel your request so you can try again.



1. What section of the assignment do you need help with?

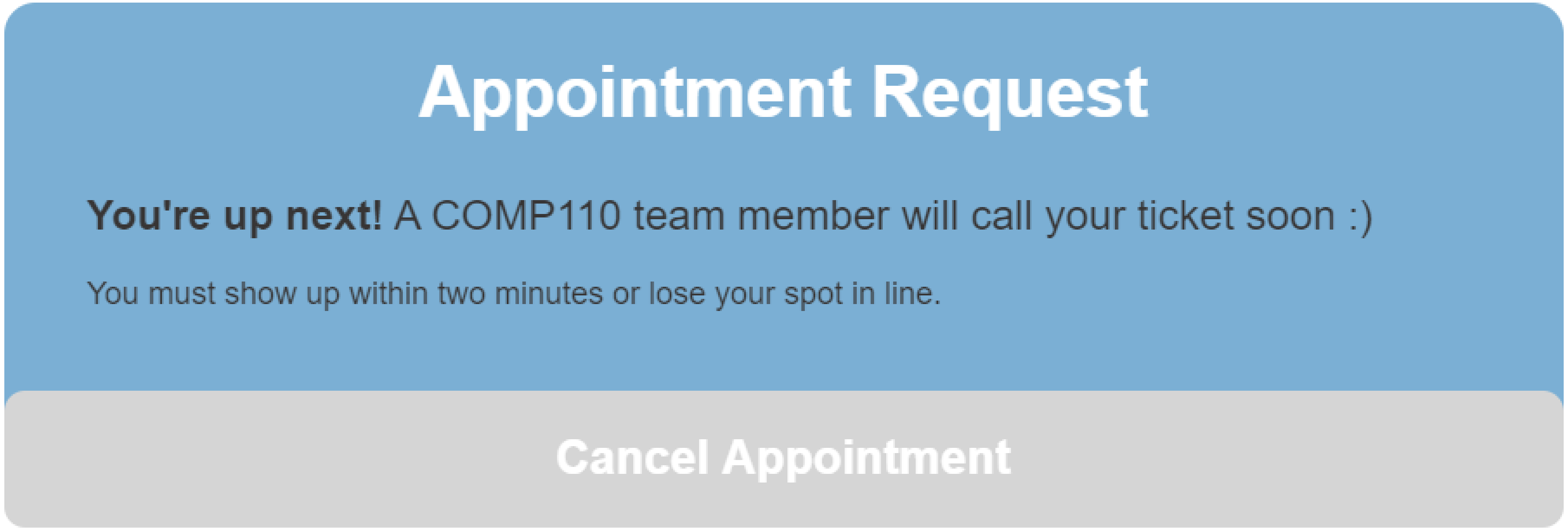
2. Describe in English what are you trying to express in code:

3. What concepts do you need to use to solve this problem?

4. What have you tried? Why do you suspect it didn't work?

Disclaimer: Your help request will be cancelled if you cannot provide meaningful responses to each question.

Office Hours Check-in Process

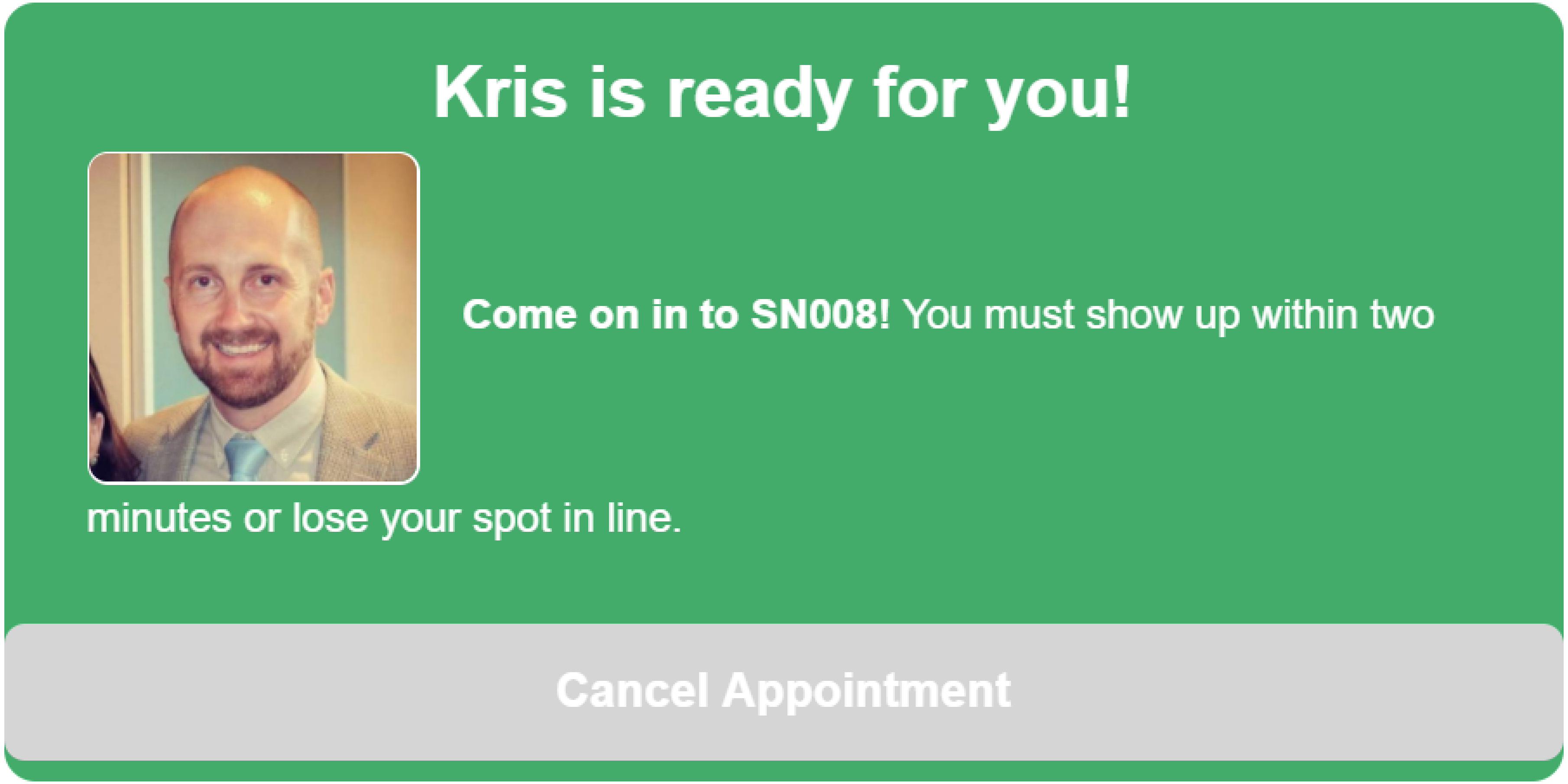


Appointment Request

You're up next! A COMP110 team member will call your ticket soon :)

You must show up within two minutes or lose your spot in line.

Office Hours Check-in Process



Kris is ready for you!

Come on in to SN008! You must show up within two minutes or lose your spot in line.

We’d love feedback throughout the semester.

- We welcome feedback on all aspects of the course
  - From as simple as “your mic was too quiet”
  - To suggestions on how to improve videos, etc.

- Feedback form is linked in the footer of the course site

- **Please give us feedback while we have time to act on it!**

- I’ll also take class wide feedback through the semester.

Connecting on Social Media

- Twitter: **@KrisJordan**
- Insta: **@therealkrisjordan**
- Finsta: **@ada_dog_omg**