

DATA ANALYSIS

Week 1: Getting Started

welcome!



Abhilasha Kumar
(she/her)

- instructor



Whitt Dodge
(he/him)

- learning assistant



Yanevith Peña
(she/her)

- learning assistant



agenda for today

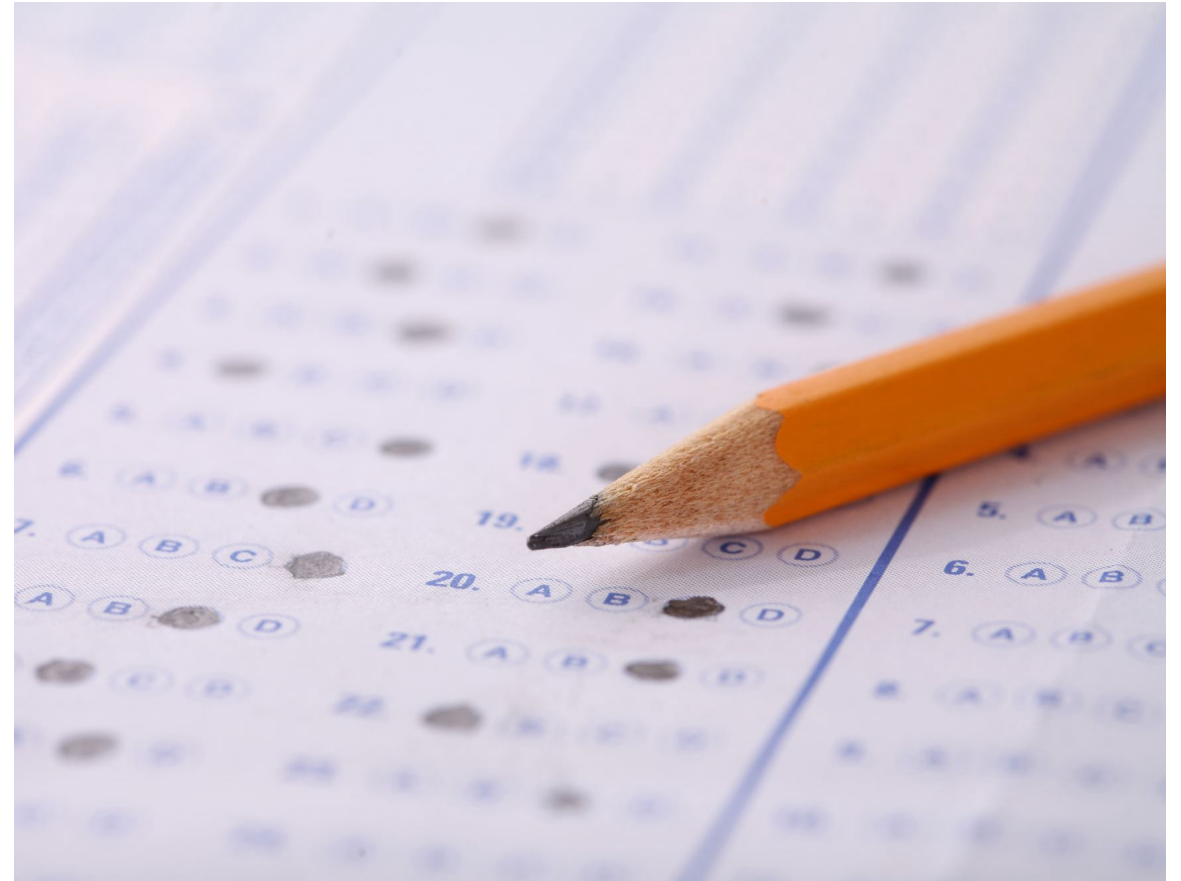
- meet & greet
- course & canvas walkthrough
- general intuitions about statistics



a problem and an ice breaker



- in groups of 3-4, discuss:
 - your names, pronouns, class years, and something boring about yourself
 - should test scores (e.g., SAT/ACT) be used for college admissions?
 - what are some pros and cons of test scores?
 - how would you tackle this problem if you were a policymaker at Bowdoin?
- report back your conversations

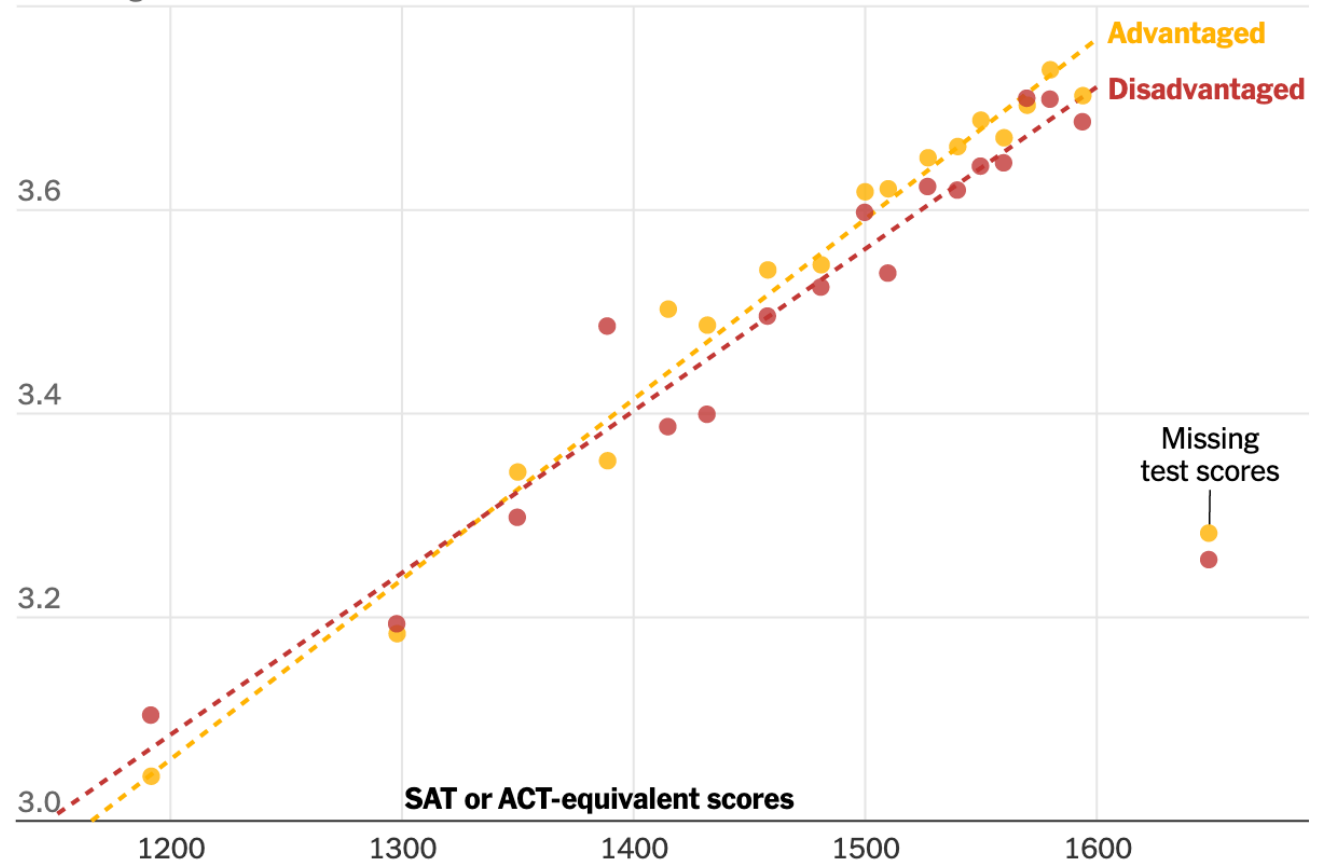


a problem

- get back into the same groups to discuss:
 - what is the information being presented in this graph?
 - what is main message the graph is trying to communicate?
 - what are some questions a policymaker may have about this graph?

Students from ● advantaged and ● disadvantaged high schools

3.8 college G.P.A.



Notes: Data is for students who entered college from 2017 to 2022, excluding 2020. • Source: Opportunity Insights and Friedman, Sacerdote and Tine (2024) • By Ashley Wu

what is this course about?

- an introduction to the statistical procedures commonly used [by psychologists] to describe, analyze, and interpret data
- learning goals
 - **understand** data, uncertainty, and the logic behind statistical thinking
 - **evaluate** scientific and non-scientific work by applying a statistical toolkit to specific claims and questions
 - **communicate** through numbers, graphs, and scientific writing
 - [empowering you with **transferable and highly valued skills**]



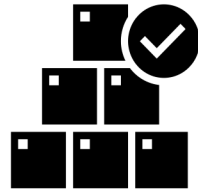
course outline



understand

lectures

activities



evaluate

quizzes

discussions

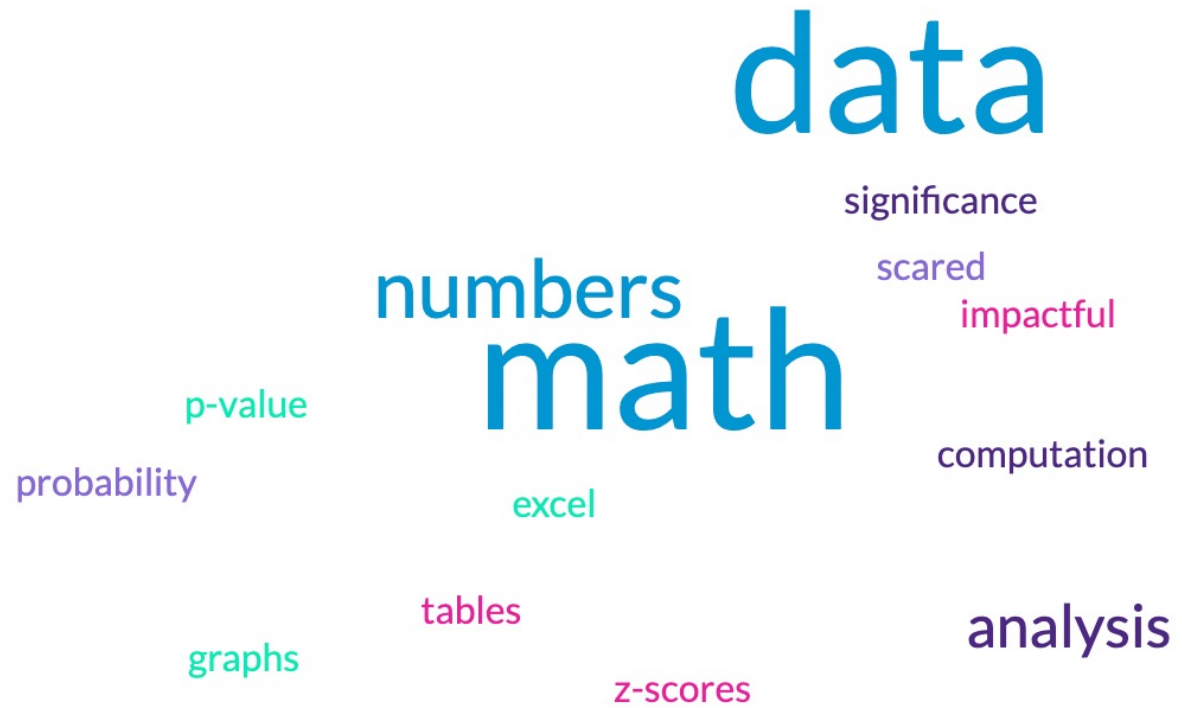


communicate

problem sets

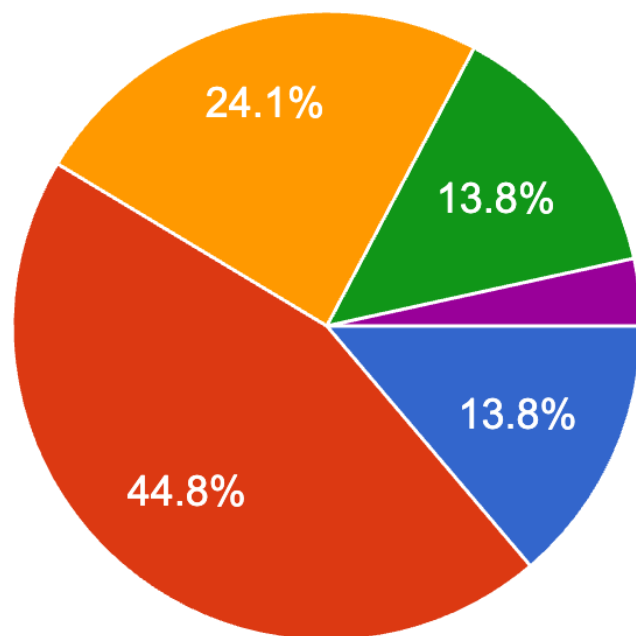
reflections

your words!



How would you describe your knowledge of statistics?

29 responses



- I have no formal knowledge of statistics
- I know the conceptual basics of descriptive statistics (e.g., calculating means, histograms, etc.)
- I know the conceptual basics of inferential statistics (e.g., t-tests, ANOVA, etc.)
- I have learned about how to perform basic statistical analyses (descriptive statistics, etc.)
- I am somewhere between no knowledge and conceptual basics of inferential statistics

so many feelings...



where does the course live?

- course website:
 - <https://teaching-me.github.io/data-analysis/>
 - course schedule and policies
 - syllabus, slides, and schedule
- canvas
 - announcements
 - ALL submissions & discussions
 - grades + Q&A
- textbook
 - Gravetter, F. J., & Wallnau, L. B. (2017). *Statistics for the Behavioral Sciences* (10th ed.). Belmont, CA: Thomson Wadsworth.



assessment formats

- quizzes

- open book, NOT open person
- on Canvas, 2 attempts: average score is recorded

- problem sets

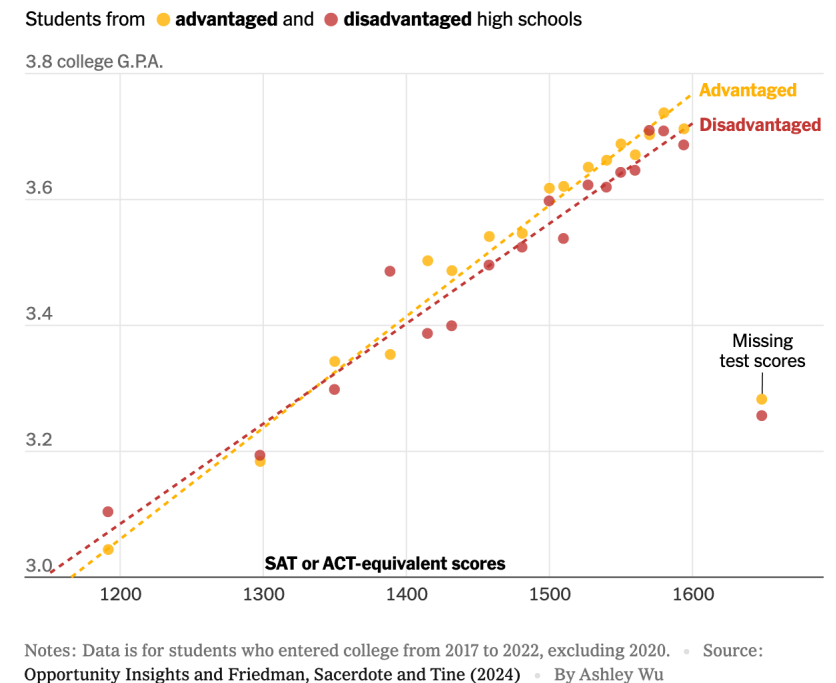
- can choose to opt-in or opt-out at three points
- submissions are on Canvas, a combination of Google Docs + Sheets

- exams

- midterms: not cumulative, final: cumulative
- quiz-like in-class component + problem set-like take-home

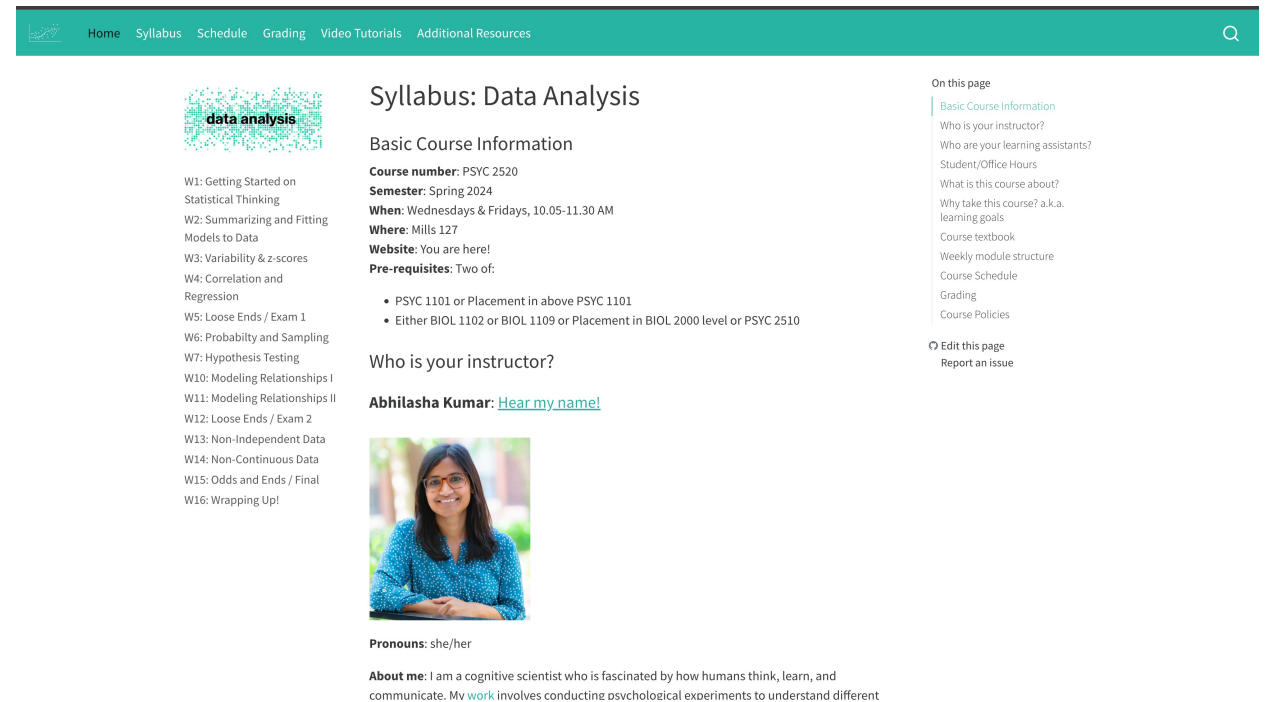
discussion board: data around us!

- will remain active **all semester**
- contributes to class participation + extra credit
- sample post:
 - [screenshot]: should be visible in the thread!
 - type of data: continuous (interval/ratio scale) SAT and GPA
 - this is a line plot that suggests that there is a linear relationship between SAT/ACT scores and GPA, and this relationship is similar for students who come from advantaged or disadvantaged schools
 - they likely fit a linear regression model predicting GPA using SAT/ACT scores, with different models for the type of high school
 - I think this is informative/interesting but I have questions: XYZ



course syllabus: questions

- find a **group** of 5!
- **review** the **syllabus** (5 minutes):
- **come back** with any questions!



The screenshot shows a course syllabus page for 'Syllabus: Data Analysis'. The page has a teal header with navigation links: Home, Syllabus, Schedule, Grading, Video Tutorials, and Additional Resources. A search icon is in the top right. The main content area is divided into three columns. The left column features a 'data analysis' graphic and a list of 16 weekly topics (W1-W16). The middle column is titled 'Syllabus: Data Analysis' and contains 'Basic Course Information' with details on course number (PSYC 2520), semester (Spring 2024), location (Mills 127), and prerequisites (PSYC 1101 or Placement in above PSYC 1101, or BIOL 1102 or BIOL 1109 or Placement in BIOL 2000 level or PSYC 2510). Below this is 'Who is your instructor?' with a photo of Abhilasha Kumar and her name with a 'Hear my name!' link. The right column is titled 'On this page' and lists various links: Basic Course Information, Who is your instructor?, Who are your learning assistants?, Student/Office Hours, What is this course about?, Why take this course? a.k.a. learning goals, Course textbook, Weekly module structure, Course Schedule, Grading, and Course Policies. At the bottom of the right column are links for 'Edit this page' and 'Report an issue'.

Home Syllabus Schedule Grading Video Tutorials Additional Resources

Syllabus: Data Analysis


Basic Course Information

Course number: PSYC 2520
Semester: Spring 2024
Where: Wednesdays & Fridays, 10.05-11.30 AM
Mills: Mills 127
Website: You are here!
Pre-requisites: Two of:

- PSYC 1101 or Placement in above PSYC 1101
- Either BIOL 1102 or BIOL 1109 or Placement in BIOL 2000 level or PSYC 2510

Who is your instructor?

Abhilasha Kumar: [Hear my name!](#)



Pronouns: she/her

About me: I am a cognitive scientist who is fascinated by how humans think, learn, and communicate. My work involves conducting psychological experiments to understand different

On this page

- Basic Course Information
- Who is your instructor?
- Who are your learning assistants?
- Student/Office Hours
- What is this course about?
- Why take this course? a.k.a. learning goals
- Course textbook
- Weekly module structure
- Course Schedule
- Grading
- Course Policies

Edit this page
Report an issue

general class format

- you are expected to do some **reading before class**
 - textbook is an aid BUT not the bible
 - video tutorials are useful to watch before and after Friday's class
- **slides** will be uploaded right before class
 - hands-on format in most classes
 - minimize looking over in advance so you can be present!
- **class time** will be devoted to
 - conceptual content
 - learning by doing
- **each week**, these things are due (prep-try-apply)
 - textbook chapters/videos (prep)
 - weekly quiz (try)
 - problem sets (try / apply / usually every week)



canvas walkthrough

- canvas will be mainly used for:
 - **announcements**
 - make sure you have **notifications turned on!**
 - go into account settings on canvas to check this
 - **all submissions**
 - weekly quizzes
 - problem sets
 - canvas discussion board (data around us)
 - meme submission
 - keeping track of **flex days**

The screenshot shows the Canvas LMS interface for a course named PSYC2520. The interface is divided into several sections:

- Navigation Sidebar (Left):** Contains icons and labels for Account, Dashboard, Courses, Calendar, Inbox, History, Commons, and Help. Below these are links to Home, Modules, Syllabus, Grades, Library Resources, BCLT Resources, Ally Course, Accessibility Report, NameCoach, BCQs, Announcements, Attendance, Assignments, Discussions, Files, Pages, People, Collaborations, Quizzes, Outcomes, Rubrics, BigBlueButton, and Settings.
- Course Header (Top):** Displays the course ID PSYC2520, the current semester (Spring 2024), and options for Student View and Immersive Reader.
- Recent Announcements (Main Content):** Shows a welcome message from the instructor, posted on Jan 17, 2024. Below the announcement is a link to "Data Analysis (Spring 2024)" with an edit icon. The announcement text discusses the "golden age of data" and the course's focus on statistical procedures.
- Course Status (Right):** Includes buttons for Unpublish and Publish, and options to Import Existing Content, Import from Commons, Choose Home Page, View Course Stream, New Announcement, New Analytics, and View Course Notifications.
- To Do (Right):** Lists upcoming assignments, including "Grade Pre-class survey" (1 point, due Jan 23 at 11:59pm) and "Grade Data Around Us!" (5 points, no due date).
- Coming Up (Right):** Lists upcoming events, including "Pre-class survey" (1 point, due Jan 23 at 11:59pm) and "Week 1 Quiz" (10 points, due Jan 28 at 11:59pm).

how to study for this class

- utilize **evidence-based effective** study strategies:
 - **retrieval practice**: quiz yourself, ask-a-friend, flash cards
 - **elaborative encoding**: ask “why” questions, try problem sets, work with data!
 - **spaced practice**: space out your studying, do not cram!
- but...your **attitudes** toward effort also matter
 - a **“growth mindset”**
 - read the assigned chapters/readings **before** class
 - come prepared to class for engagement
 - minimize distractions
 - plan early for assignments and assessments

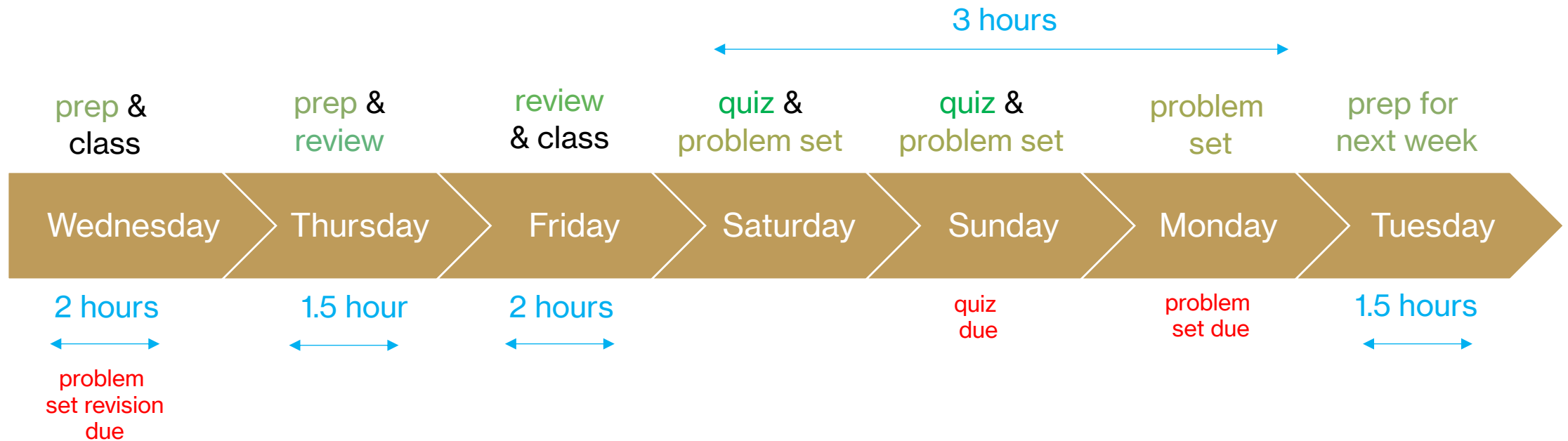


the course is designed to support you

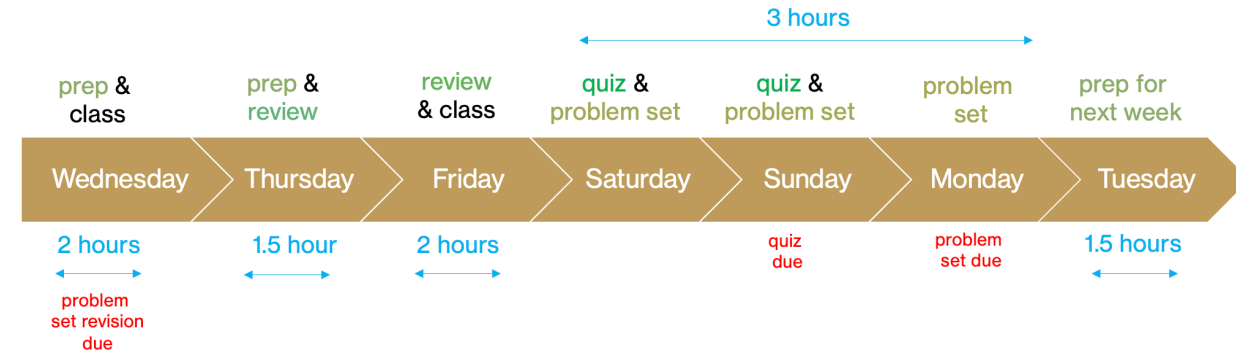
- retrieval practice
 - class participation via activities/reflections
 - weekly quizzes on each learning module
- elaborative encoding
 - exercises that force you to learn by doing
 - discussion boards that connect class content to real life
- spaced practice
 - later concepts build on early concepts
 - problem sets involve integrating old and new content
 - exams are cumulative



a weekly breakdown



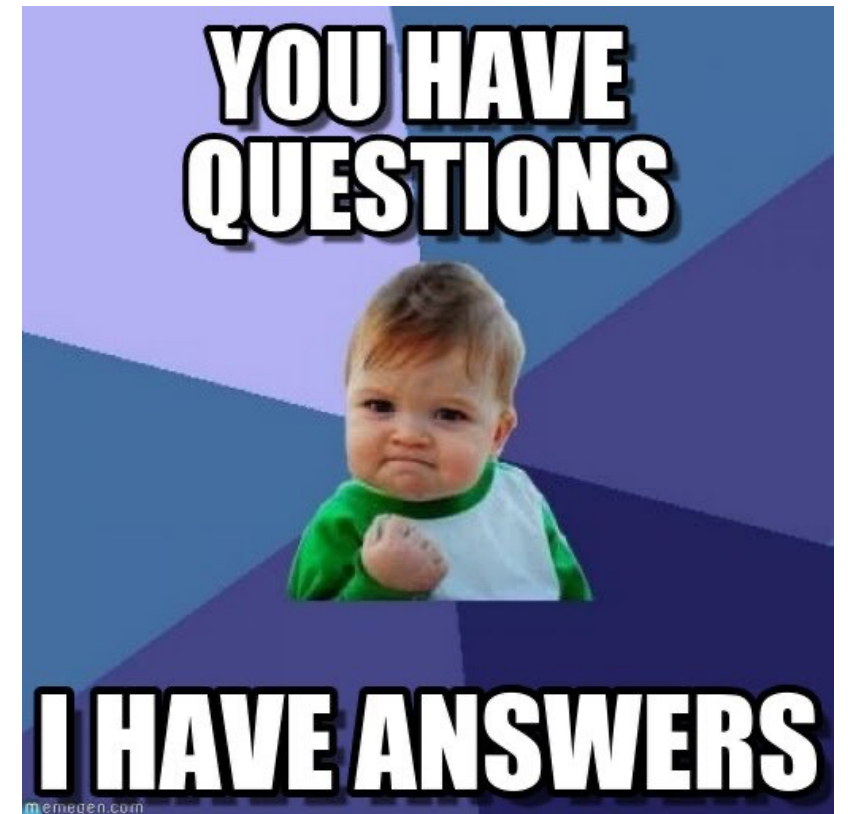
if I was a student, I would...



- USE A CALENDAR!!
- **keep track** of deadlines **a week ahead of time**
- use retrieval practice / elaborative encoding strategies
- make **high-quality notes** in class
- **revisit** notes and do some retrieval practice / reflection on **Thursday/Friday**
- **complete quiz on Sunday**
- allocate Saturday/Sunday/Monday to problem set
- think about a possible meme and/or discussion post on Saturday/Sunday

when you have thoughts and questions

- **office hours**: these are YOUR hours!
 - Prof. Kumar (Kanbar 217)
 - in-person: Wednesdays, 2 pm - 4 pm
 - via Zoom: Thursdays, 2 pm - 4 pm
 - Whitt: Mondays, 7 pm - 8.30 pm (Kanbar 101)
 - Yanevith: Sundays, 3.30 pm - 5 pm (Kanbar 101)
- meetings by **appointment**
- anonymous **feedback** surveys each month



reasons to come to office hours (and whose)

- Prof. Kumar

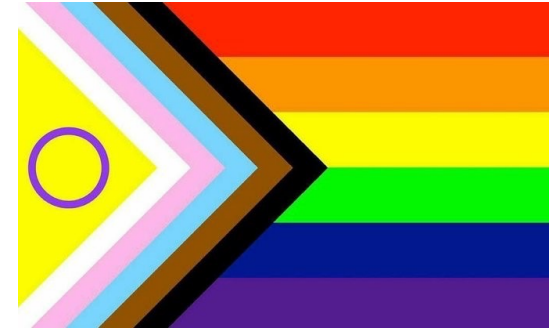
- Qs about material / concepts / assignments
- Qs about course policies/assessments/grades
- reflections on the classroom experience

- learning assistants

- Qs about problem sets
- informal feedback about course pace
- Qs about Canvas deadlines/due dates
- tech troubleshooting



valuing our voices



- I will try my very best to create an **inclusive environment** for all of you
 - we are all **different** and that is a **strength**
 - we also exist **beyond the classroom!**
- but...nobody is perfect!
 - my style may not match your style
 - I am always listening and learning so PLEASE reach out!

sheets 101: demonstration



- any [dataset](#) typically has rows and columns
 - each row (typically) denotes a single observation / data point
 - each column (typically) denotes the measure being observed
- doing math in Sheets is super easy
 - double click on an empty cell:
 - o add two numbers: $=2+3$
 - o subtract two numbers: $=2-3$
 - o multiply two numbers: $=2*3$
 - o divide two numbers: $2/3$
 - adding values from existing columns
 - o $=A2+B2$ OR $SUM(A2,B2)$

quick note on math notation

- Σ : sigma / summation
- ΣX = adding all values in column X
- ΣX^2 = squaring all values in column X and then adding them
- $(\Sigma X)^2$ = adding all values in column X and then squaring the sum

next time

- **before** class
 - *prep*: Chapter 1 + Appendix A from textbook + Google Sheets video
 - *prep*: Google Sheets video (see website)
- **during** class
 - statistical thinking / what are data??