STAT 80B
The Art of Data Visualization
Fall 2023

Instructor: Zehang "Richard" Li
Office Hours: E2 537B, 2:00 - 4:00 Thursday
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Course Meeting Times: 11:40 - 1:15 Tuesday/Thursday
Location: R Carson Acad 240
Website: Through `Canvas`

TA: Zach Horton
TA E-mail: whorton@ucsc.edu
TA Office Hours: TBD (See `Canvas` for update)

Course Description: The course presents a basic introduction to data visualization, the art of storytelling data as a visual graphic. Students will obtain an overview of the basics of data and descriptive statistics. The course will emphasize analyzing data to find patterns, develop/assess hypotheses, and effectively communicate information using statistics and visual story-telling. We will use visualizations to explore and answer questions about various types of data related to everyday life. Students will learn about some of the best practices in data visualization and receive hands-on experience in creating visual narratives using Tableau.

Textbook: There is no required textbook for this course, useful references we will use include:

- Cairo, Alberto. *The Truthful Art: Data, Charts, and Maps for Communication.* New Riders, 2016

- Diez, David M., et al. *OpenIntro Statistics.* Openintro.org, 2019

- Wilkinson, Leland *The Grammar of Graphics* Springer, 2005.

Prerequisites: This course has no prerequisites and is accessible for students of all backgrounds. Any statistics or technical knowledge needed will be covered in class.

Technology: Tableau is a powerful tool used to analyze and visualize data. Due to its user-friendly and accessible features, we will be using this software to explore data and create dashboard visualizations. This means that you will need access to a computer or laptop to download and install this software. Note that if you do not possess a laptop or a computer the McHenry Library offers laptop loans to students for free.

All students will be provided with free license to use Tableau during the quarter and

more information to continue using Tableau after the quarter will be provided on Canvas.

Course Expectations: Although attendance is not mandatory, it is highly recommended in order to gain the most out of the course. Students may work together on assignments, but must submit any work as their own (no copying from other students or other sources).

We will provide video tutorials for basic instructions and demonstrations of Tableau on Canvas. For specific Tableau (or other software) questions, please ask them on the Canvas discussion board (so that anyone in the class can help) first. If the discussion board does not address the question, please make use of the office hours.

Assessment and Grading:

- Participation (5%): Both in-class participation and Canvas discussion board activities (posting questions and answering questions) will count towards participation.

- Homework (30%): There will be 3 homework to be submitted on Canvas.

- Critical Review (15%): In this individual assignment, you will find a visualization design from the internet, and provide a critical review of the visualization.

- Term Project (50%): There will be one term project, where you will be working in groups of two students. You will identify a dataset and produce a visualization design for the dataset. Your project should address a concrete real-world question of interest and should propose a creative visual design to communicate the data. More specifically, the project consists of the following component:

  - Midway report (10%): a midway report with the explanation of the dataset, some initial visualizations, and discussion of the challenges and expected outcome.

  - Presentation (10%): there will be a 10 minute presentation during class.

  - Peer review of project (10%, individually graded): each student will need to complete two peer review of the midway reports.

  - Final report (20%): a final report and a standalone visualization will be due during the Finals week.

There will be extra credit opportunities. Extra credit is a way to help you through any difficulty that you might encounter and to support you in case you miss some assignments. Note, however, there will be no curves, no rounding, no extra assignments, and no changes when the final grades are posted.

- Extra Credit Homework (6%).

- Mid Quarter Survey (2%): a survey to see what's working and what's not.

- SETs (2%): if more than 75% of the class completes them before the deadline.

We will use the following letter grade conversion table. The specific cutoffs within each group will be provided at the end of the quarter.

Letter	Score
A- to A+	[85, 110]
B- to B+	[70, 85)
C to C+	[60, 70)
D	[50, 60)
F	[0, 50)
P	≥ 60

Principles of Community
The University of California, Santa Cruz expressly prohibits students from engaging in conduct constituting unlawful discrimination, harassment or bias. More here. I am committed to providing an atmosphere for learning that respects diversity and supports inclusivity. We need to work together to build this community of learning. I ask all members of this class to:

- be open to and interested in the views of others

- consider the possibility that your views may change over the course of the term

- be aware that this course asks you to reconsider some "common sense" notions you may hold

- honor the unique life experiences of your colleagues

- appreciate the opportunity that we have to learn from each other

- listen to each other's opinions and communicate in a respectful manner

- keep confidential discussions that the community has of a personal (or professional) nature

- ground your comments in the texts we are studying. Refer frequently to the texts and make them the focus of your questions, comments, and arguments. This is the single most effective way to ensure respectful discussion and to create a space where we are all learning together.

Accessibility
UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by email, preferably within the first two weeks of the quarter. At this time, I would like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC

services to contact the DRC by phone at 831-459-2089 or by email at drc@ucsc.edu.

Intellectual Property
The materials in this course are the intellectual property of their creators. As a student, you have access to many of the materials in the course for the purpose of learning, engaging with your peers in the course, completing assignments, and so on. You have a moral and legal obligation to respect the rights of others by only using course materials for purposes associated with the course. For instance, you are not permitted to share, upload, stream, sell, republish, share the login information for, or otherwise disseminate any of the course materials, such as: video and audio files, assignment prompts, slides, notes, syllabus, simulations, datasets, discussion threads. Conversely, any materials created solely by you (for example, your videos, essays, images, audio files, annotations, notes) are your intellectual property and you may use them as you wish.

Religious Accommodation
UC Santa Cruz welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request reasonable accommodation for religious practices. The instructor will review the situation in an effort to provide a reasonable accommodation without penalty. You should first discuss the conflict and your requested accommodation with your instructor early in the term. You or your instructor may also seek assistance from the Dean of Students office.

All-gender restrooms
UC Santa Cruz is committed to the well-being of all students and cares about all students feeling safe and welcome, regardless of their gender identity, expression, and/or embodiment. The Lionel Cantú Queer Center has worked with students and campus staff to create more safe and accessible restrooms for transgender and genderqueer students, staff, faculty, alumni, and UCSC visitors. A complete list of all-gender restrooms on campus was compiled and is maintained by the Cantú Queer Center: `https://genderinclusive.ucsc.edu/inclusive%20facilities/images/gif-list-5-17-17.pdf`

Title IX/CARE Advisory
UC Santa Cruz is committed to providing a safe learning environment that is free of all forms of gender discrimination and sexual harassment, which are explicitly prohibited under Title IX. If you have experienced any form of sexual harassment, sexual assault, domestic violence, dating violence, or stalking, know that you are not alone. The Title IX Office, the Campus Advocacy, Resources & Education (CARE) office, and Counseling & Psychological Services (CAPS) are all resources that you can rely on for support.
Please be aware that if you tell me about a situation involving Title IX misconduct, I

am required to share this information with the Title IX Coordinator. This reporting responsibility also applies to course TAs and tutors (as well to all UCSC employees who are not designated as "confidential" employees, which is a special designation granted to counselors and CARE advocates). Although I have to make that notification, you will control how your case will be handled, including whether or not you wish to pursue a formal complaint. The goal is to make sure that you are aware of the range of options available to you and that you have access to the resources you need.

Confidential resources are available through CARE. Confidentiality means CARE advocates will not share any information with Title IX, the police, parents, or anyone else without explicit permission. CARE advocates are trained to support you in understanding your rights and options, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and more. You can contact CARE at (831) 502-2273 or care@ucsc.edu.

In addition to CARE, these resources are available to you:

- If you need help figuring out what resources you or someone else might need, visit the Sexual Violence Prevention & Response (SAFE) website, which provides information and resources for different situations.

- Counseling & Psychological Services (CAPS) can provide confidential counseling support. Call them at (831) 459-2628.

- You can also report gender discrimination and sexual harassment and violence directly to the University's Title IX Office, by calling (831) 459-2462 or by using their online reporting tool.

- Reports to law enforcement can be made to the UC Police Department, (831) 459-2231 ext. 1.

- For emergencies, call 911.

Report an Incident of Hate or Bias
The University of California, Santa Cruz is committed to maintaining an objective, civil, diverse and supportive community, free of coercion, bias, hate, intimidation, dehumanization or exploitation. The Hate/Bias Response Team is a group of administrators who support and guide students seeking assistance in determining how to handle a bias incident involving another student, a staff member, or a faculty member. To report an incident of hate or bias, please use the following form: Hate/Bias Report Form.

Counseling and Psychological Services
Many students at UCSC face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional well-being. The university offers a variety of confidential services to help you through

difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

Student Success and Engagement Hub
The Division of Student Success provides campus-wide coordination and leadership for student success programs and activities across departments, divisions, the colleges, and administrative units.

Slug Support Program
College can be a challenging time for students and during times of stress it is not always easy to find the help you need. Slug Support can give help with everything from basic needs (housing, food, or financial insecurity) to getting the technology you need during remote instruction. To get started with SLUG Support, please contact the Dean of Students Office at 831-459-4446 or you may send us an email at deanofstudents@ucsc.edu.
Slug Help/Technology
The ITS Support Center is your single point of contact for all issues, problems or questions related to technology services and computing at UC Santa Cruz. To get technological help, simply email help@ucsc.edu.

On-Campus Emergency Contacts

Slug Help/Emergency Services. For all other help and support, including the health center and emergency services, start here (`https://www.ucsc.edu/help/`). Always dial 9-1-1 in the case of an emergency.

Tutoring
There is tutoring available for this class, provided by Learning Support Services (LSS)! Learning Support Services Tutors are an important part of the teaching team and are here to help you be successful. Large Group Tutoring is for everyone and open to all students in class to get extra practice on the things you already know or the things you want to know better. Your tutor(s) is an undergraduate student who took the class, did well, and received extensive training on how to help you learn! Sessions are one-hour long, available several days a week and attendance is voluntary; however, students who attend sessions weekly tend to earn a higher final grade than students who do not participate. Ask your tutor for more information about session times, visit our website, or visit us in person at the ARCenter or remotely at our Virtual Front Desk, M-F 9am-6pm. You can also view your Tutor's schedule on The Tutor Hub.
Academic Integrity: Academic integrity is the cornerstone of a university education. Academic dishonesty diminishes the university as an institution and all

members of the university community. It tarnishes the value of a UCSC degree. All members of the UCSC community have an explicit responsibility to foster an environment of trust, honesty, fairness, respect, and responsibility. All members of the university community are expected to present as their original work only that which is truly their own. Plagiarism of any kind is unacceptable. All members of the community are expected to report observed instances of cheating, plagiarism, and other forms of academic dishonesty in order to ensure that the integrity of scholarship is valued and preserved at UCSC. Any student found in violation of the UCSC Academic Integrity policy may face both academic sanctions imposed by the instructor of record and disciplinary sanctions imposed by the graduate division. Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student's transcript. For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the Academic Integrity page at the Division of Undergraduate Education or Graduate Division.