

Artifact 1 **Discussion Commitments**

CU Dialogues Portfolio - Spring 2025
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Overview

In my field of Data Science, closely tied to Computer Science or more generally STEM, **student needs** relate to the following:

- DS students come from varying backgrounds:
 - Those who come from CS background usually struggle with mathematical concepts required to understand complex heavily math-reliant algorithms. These students may also lack in domain specific knowledge.
 - Students who come from other domains usually are experts or highly knowledgeable in their specific domain. This gives them advantage in understanding how to use data and how some data features react with one another. However, they usually lack in technical data and computer knowledge.
- Not all DS students are proficient in coding, so sometimes they need simplifications of technical concepts, rather than abstractions which is common for CS majors.
- Develop a technical and conceptual understanding of concepts.
- Be able to decide what tool works best and under what conditions and restrictions.
- Working as an individual helps develop problem-solving frameworks.
- Group work develops skills required to collaborate with a big team of people, who may be equipped with the same or different tools.

Student feedback can be in the form of quick feedback surveys after a Discussion ends, after a group or individual work is submitted. Feedback can be collected from questions like:

- How did you feel doing this task or assignment?
- What were the best and the worst things about this experience and why?
- What do you think you learned from this exercise?
- Would you recommend this exercise to another student?
- Recommendations

Learning Goals

When designing my courses, I would like students to be able to:

- A layout or flowchart for processes before getting technical.
- Build a **problem-solving framework** and define specifications including potential architectures before tackling the problem.

- A lot of **brainstorming** and **user-centered design** approach, to allow for limitless **creativity**.
- Define what the best practices look like.
- Learn how to make useful documentation
- Learn to use documentation to reach their end goals.
- All data wrangling processes should be documented extensively to allow for and ensure **transparency, reproducibility, and trustworthiness**. Building reflexes and reasoning capabilities that align with these goals is important for a data professional.
- A reminder of ethical considerations linked to **data use** and **privacy**.
- A lot of what a data scientist does relates to dealing ethically with data, especially with missing values, and accurately representing the situation.
- Data should be used responsibly, in a way to help decision-makers see the full picture and make more sound decisions. The analysis provided by the data scientist should then have **minimal to no bias** ideally.
- Students need to be involved in all steps on conceptions to develop enough understanding of all the steps.

With this, I have developed the following **Discussion Commitments** document.

Discussion Commitments

1. Start a conversation to decide on what the end goals from the exercise or discussion are.
2. Build a basic framework on how to approach the problem.
 - a. Start with an individual exercise of describing the problem from own perspective: "I see the problem as". Prepare a set of questions to answer to solve the problem. Provide a list of approaches and reasoning behind choices. (*This could be done as a homework before coming to class*).
 - b. In class, organize groups and employ a **circular leadership** approach to have everyone just as engaged in the conversation or discussion. The discussion should follow a structure to help create a problem-solving mindset and reflexes for breaking down the problem.
 - c. **Fumble Forward** technique to discuss how each person understands the concepts and how each concept fits in the solution. This sets a standard for how everyone is looking at the problem.
 - d. How it all ties together – What a discussion could look like:
 - i. **Base Approach:**
 - Share responses to assigned prep-work: how you see the problem from own perspective: "I see the problem as"
 - Present your own background to the group and reflect aloud on potential biases that might arise as a consequence.
 - "The concepts I find tied to solving this problem are and how they will help solve the problem is"

- Use the “I’m about to fumble with my words/ideas…” (by holding a sign that says it rather than saying it every time as it might lose meaning) to discuss one’s own understanding of the problem or respond to other teammates’ approaches.
 - ii. **Alternative Approach 1:** Write down on a note and stick on a board. Have each student pick another paper and respond to it on the same paper or on the back of the paper, generating so much feedback to reflect on.
 - iii. **Alternative Approach 2:** This could also be done online in a discussion board, anonymously, where each person replies to each person’s post. This also helps collect a lot of feedback in an organized way.
 - iv. **Alternative Approach 3:** Make a pitch style video at most 90 seconds long discussing all those points in approach 1. Have additional resources for people to consult. Students will use a rubric to write a structured response to the video.
3. All the previous approaches include the following as a rubric:
- a. Students’ response to the problem statement:
 - i. Self-reflection on potential biases the student might bring to the work.
 - ii. How they plan to tackle this potential bias.
 - iii. The problem statement and key input/output/process considerations, in text and architecture or flowchart style structure.
 - iv. The proposed outline for tackling the problem accompanied by a table of what, how, and why design choices were made. Have a comment box for students to fill for each row.
 - v. Discuss potential limitations.
 - b. Peer Reviews:
 - i. Reflection on how they see the potential biases of the student and relating it to the reviewer’s experience.
 - ii. Additional recommendations on how they plan to tackle the potential bias.
 - iii. Fill the comment box in each row of the design choices.
 - iv. Reflect on ethical consideration. Review if diversity and inclusion considerations were also taken into account.
 - v. Propose potential solutions to the limitations.
 - vi. Propose possible limitations to the project. This is counter intuitive but also helps open the conversation more.
 - c. These peer reviews will be assessed by another student in a rotational manner to get everyone involved in each other’s projects.
 - d. Students’ ability to follow the rubric and provide structured documents allows them to develop a key skill for Data Science professionals – presenting information and results in a meaningful, insightful, simple, and clear way.

4. The last part of the discussion would be to build a presentation style power point with all ideas and feedback incorporated.
5. The entire class writes feedback on paper for each presenter to review later. The feedback could also be in a 90 second video format, without necessarily showing their face. Students in the beginning are asked about their comfort level and accommodation needs before class officially starts. Data and feedback (learning styles, comfort level with videos, ...) will be used in this class all throughout, making sure the class is inclusive and considerate to all students to allow them to maximize their learning.