CS120 Participation & Learning Portfolios
Fall 2022

CS120 is a collective learning experience, where we all should be working together to support each others' progress. Thus, we expect you to keep a portfolio of the best examples of where participation helped advance your classmates' or your own learning, or helped improve the class. We also hope that engaging in this exercise helps you develop a habit of critical reflection on the impacts of your participation, how you can participate most effectively in the future (in this class, or the next), etc. Four times during the semester we will ask you to submit the top three highlights from your portfolio; the dates can be found on the course calendar. These can be based on any form of participation: in class/section/office hours, in discussions on Ed, in our feedback surveys, in your collaborations on problem sets, etc.

Contents

Each of the 4 highlight submissions should include 3 examples of meaningful participation, each described concisely (at most 200 words total per example) using the following 3-part format:

1. **What?** Describe the participation/engagement you are reporting. Recall that we have a broad definition of participation, including our active learning exercises, answering or asking questions in class/section/OH/Ed, discussing the material with your classmates in study groups, offering constructive feedback on the course. Be as specific as possible, including concrete descriptions of what you said or did (e.g., quoting from your active-learning reflections) and when you did it. We welcome reporting on engagement that follows up on your previous portfolio, e.g. pursuing an approach from a previous "now what" or that was suggested in the feedback. Some guidelines:
    a. In each highlights submission, all three of the examples should involve different forms of participation.
    b. In each highlights submission, at least one of your examples should be from a Sender-Receiver exercise.
    c. In each highlights submission, at least two of your examples should involve participation that affected others' learning (not only your own).
2. **So what?** What was the impact that you believe the participation had, and what evidence do you have of that impact? For example, it could have improved your classmates' understanding of a difficult concept, filled in gaps in background knowledge, raised an interesting issue for discussion, increased the sense of community in the class, or led to improvements in the class implemented by the teaching staff. When appropriate, connect the impact to the learning outcomes of the course as listed in the syllabus. Evidence of impact could include a screenshot of follow-up discussion to your comment on Ed, or a classmate's quote where he or she explains in what

meaningful/substantial ways you impacted his or her learning. If you think something you did helped one of your classmates' learning, ask that classmate to find out! It is OK if the answer is negative and it did not actually help—you will get full credit for reporting what you find, as long as you thoughtfully reflect on it in Item 3 below. If you are unable to obtain evidence either way, explain why, and in Item 3 discuss how you might do so in the future.

3. **Now what?** Reflect on how your participation and what you have learned about it will affect what you, your classmates, or the course will do in the future. For example, what insights have you gained about your own and your classmates' learning processes? What forms of engagement are most effective for supporting learning and why? How might you change your approach to participation in future classes? What other ways can you obtain evidence to validate or otherwise test the impact of your participation?

Examples

We are sharing (with permission) some excellent examples from Fall 2021, along with our comments on strong features of these submissions. What we want you to take from these examples are illustrations of the kind of detail, evidence, and reflection we are looking for in the portfolios.

Example 1

What?
As a sender on the first Active Learning Exercise, I went through the exercise normally with my receiver and he understood the concepts very well. After class, I saw another receiver who had not understood the exercise with his original sender. I stayed late after class to work through the exercise once more with this new receiver and make sure that he understood the concepts and the purpose of the exercise.

So What?
My help enabled this student to understand the Counting Sort algorithm very well. We became friends as a result of this encounter, and we worked together on the Radix Sort algorithm on Pset 1, so I know from the attached texts that he deeply understood the counting sort algorithm and was able to apply that knowledge in future problems. Now, we work together on every problem set.

Now What?
I learned from this experience that putting in extra time to help others can really make a difference for them and contribute to their understanding on every problem they encounter in the future that is related to the one I help them with. I benefit because this helps me to build relationships with other students so that we can all learn better together and support one another.

Notable features of this example:

- Identifying a classmate's need and extending oneself to address it
- Evidence based on future interactions
- Reflection on the mutual benefits of helping classmates

Example 2

What?
I was a sender for the active learning exercise on deletion of a node in a BST. Before I began, I asked my receiver what they believed would be the most challenging part of the proof. They correctly identified that the difficulty would come from maintaining the BST property and ensuring subtrees were preserved post-deletion.

I asked my partner, "How do you think we might handle deleting a node if it has no children or 1 child?" Finally, when we reached the 2 children case, I asked "Do you think we should replace the node to delete with its direct children, like in the 1 child case?"

So what?
I believe that asking what would be challenging about the process helped prime my partner to outline the case structure for the proof. I also found that asking whether the 2 children case would be similar to the 1 child case enabled my partner to immediately start thinking about alternative approaches. The best evidence of impact was that my partner did a lot of independent discovery for how to design the solution without me having to over-explain.

Now what?
I believe that the process of using guiding questions to point my partner in the right direction proved useful for allowing them to think critically about how to design solutions, which I think better allowed them to anticipate edge cases. There was a moment during the 2 children case where my partner was very stuck, and I think I should have provided more hints in that case (perhaps through even more guiding questions).

Notable features of this example:

- Concrete and specific
- Evidence of impact by observing classmate
- Reflection about what worked well and what could be improved

Example 3

What?
I engaged in the Active Learning Exercises on September 9 as a Receiver. I attached my reflections below.

So what?
For this Active Learning Exercise, I worked with classmates X and Y in a group of three. During the discussion, I focused extensively on different edge cases that I thought "broke" the algorithm. They mentioned that my examples helped the discussion focus on correctness and other conditions that may be required for the algorithm. This led to better discussion and critical thinking, which helped improve his understanding and had a positive impact. I also gave them meaningful feedback on which parts of their explanation were confusing or clear, which will hopefully help him improve too.

Now what?
X and Y did also mention that sometimes my edge cases and detailed objections were very niche and detracted from the overall flow of the algorithm explanation. Reflecting, I should have been more deliberate to only bring up important exceptions central to the algorithm, which I aimed to do in following weeks. Additionally, I realized that my intuition for understanding an algorithm quickly needed more work so that I can better contribute to discussions, which I will work to continue building.

Notable features of this example:

- Concrete and specific
- Evidence of impact through constructive (positive and negative) feedback from peers
- Reflection on what worked and didn't work well, conscious effort to modify approach going forward

Example 4

What?
I enjoy going to Salil's Office Hour to ask algorithm questions or questions that relate back to my research at Harvard. We had really good discussions about how we can think about coming up with better algorithms, randomness, and pseudorandomness, and what does it mean to be random and how do we prove that the random is purely random.

So What?
Salil introduced me to the idea of Quantum Randomness, where researchers use quantum mechanics to come up with truly random numbers, which is really exciting. We also talked about how randomness relates back to privacy applications, and about how local sensitive hashing can be applied back to the research I am currently doing at Harvard. Seeing how algorithms apply to daily life and my research as well as connecting different domains of sciences increases my passion for algorithms.

Now What?
I have learned that never be afraid to ask questions and engage with professors outside of class. When I share how useful and interesting algorithms can be to my friends, they are in awe that an algorithm can have its beauty beyond its theoretical proofs. I look forward to participating in more office hours and learning beyond the textbook.

Notable features of this example:

- Concrete and specific
- Engagement driven by curiosity, connecting the course material to one's other interests
- Reflection on benefits of approaching faculty (there's nothing to fear!)

Grading

As discussed in the syllabus, we will use the same N/L/R-/R/R+ scale for grading your participation highlights, but with the following interpretations:

- N: Your submission is too incomplete or deviates too far from the instructions for us to assess your level of participation.
- L: Your submission demonstrates a minimal amount of participation in the course and effort on the assignment, but is below expectations.
- R-: You seem to be meeting most of the expectations for participation, but have not followed all of the guidelines for assignment.
- R: Your submission demonstrates that you are a fully engaged member of the course's learning community and meets the specified guidelines.
- R+: Your submission goes beyond expectations, in the level of your positive contributions to the course's learning community and/or the thoughtfulness of your reflections on your participation.