

COMP 321 – Winter 2020 - Group Problem Presentation

35% of course grade

For this final objective, you will solve a difficult programming challenge with a team of 3 and prepare a presentation to describe your solution. Notice that this activity is essentially the way coding interviews are often conducted. The objective is to show off your skills in analyzing problems, selecting algorithms, and creating correct implementation details to the audience of your presentation (in this case, myself, the TAs and your peers play the role of the interviewer).

Detailed Instructions

We will assign you one difficult programming challenge. You must attempt to solve it in the best possible way with your team. You should spend less than 3 hours of time each attempting to solve the problem, and you should record the progression of ideas you had, and code you tried during this time.

Create a 5 minute Powerpoint (or Keynote, Libreoffice, Latex etc) presentation with these sections:

- Problem analysis:
 - State the challenge of the problem in your own words. Strip away the “nonsense” text that Kattis has used to distract you and say in a simple form what’s being asked.
- Solution concepts:
 - Describe more than one idea you had about a potential solution. Consider following the structure of our course lectures to frame the progression of what you tried and how you made the decision about what to try next.
 - Analyze the correctness and run-time complexity of each algorithm you mention.
 - Show the code and explain how it implements each idea.
- Final results:
 - Describe your final progress. Which public test cases pass and which fail? What new test cases did you create yourself to map out how the code works and where it’s limited? How do you do on the private Kattis cases?
 - Important note: you do not have to score an “Accepted” result for full marks on this presentation. If you have tried several things for 3 hours, if each of those was a reasonable choice and your explanations are clear, then this can still get full marks.
 - Of course, try to get “Accepted” if you can!

Give your presentation in one of two ways: live in the final Zoom class or by recording a video that you submit on My Courses.

Schedule

- March 30: Teams and problems announced
- March 30: Online Zoom class session for questions and advice
- April 5th: Presentation files due at 6pm
- April 6th: Online Zoom class session for live presentations

Problem Selection

You may choose to present on any of the problems listed below. Note, they have a range of Kattis “Difficulty” score from 4.1 to 6.4. A small portion of the grading scheme (10%) will be dedicated to which problem you choose. The number written to the right of the problem link indicates each problem’s difficulty score.

- A. <https://open.kattis.com/problems/beepproblem> - 0%
- B. <https://open.kattis.com/problems/incrementalinduction> - 3%
- C. <https://open.kattis.com/problems/spaceprobe> - 6%
- D. <https://open.kattis.com/problems/expectingrain> - 8%
- E. <https://open.kattis.com/problems/paintingafence> - 10%
- F. <https://open.kattis.com/problems/juice2> - 11%

The best choice is to present a difficult problem well (best of both worlds). However, it’s better to do a good job on an easier problem than a poor job attempting something you can’t understand.

Marking Scheme

- Analysis of the problem: 20%
 - Find the key aspects of the problem statement (and discard distracting parts)
 - Explain important factors in the input and output
- Solution concepts: 60%
 - Clearly describe each and their differences: 20%
 - Discuss run-time and memory, correctly and connected to your code: 20%
 - Code clarity, comments (or self-readability), walk-through in presentation: 20%
- Solution: 20%
 - Optimality of your final code: 10%
 - How hard was the problem you selected: 10%

We’ll use both the PDF slides as well as the presentation (live in class or video) to judge all aspects.

Handing In

On My Courses, one designated team member should hand in:

- A single PDF file with your combined presentation. Make sure to write your team Number, CodeName and the names and McGill IDs of all team members on the first slide.
- Any code files you created during the process, including solutions that work and attempts that don’t (mark the best one with BEST)
- If you choose to present by video: you can merge all 3 students’ portions into one video file (for example you can record it while doing a joint Zoom call), or you can submit 3 separate files – whatever is easiest for you regarding editing, internet connection, etc.

For all files, include your Team Number and CodeName in the file name, along with any additional words needed to help us understand what to find there.

Expectations and Honor Code

There are clearly a million ways to get help with work at home, so I'm trusting you to present your group's unique analysis and solution to the problem. There are some resources that would be OK to use during this process, such as reading textbooks to find new algorithm ideas. I even think it would be a good idea for you to looking through posted solution code for similar problems, which can help you translate concepts into practice.

You should not try to find the solution to these problems themselves on the Internet, or ask anyone else to solve them for you. Take special note that sharing solutions across different groups in 321 is explicitly not OK.

On the last slide of your presentation, you should follow the good academic practice of referencing any sources of information you used, including textbooks, online slides and videos, and even people you talked with. Being honest about these resources will help us to understand if two solutions end up looking very similar because both groups started from the same template, etc.