

Spring 2026 COP 4516 Team Final Contest Summary (by Arup Guha)

The first part of the summary will be a problem-by-problem analysis of how teams did in the contest and some observations about the problems. The second part will be an analysis of the teams and how they did.

Here is the first, by problem:

Problem A: We've got the Beat

Solved by: 18 out of 18 teams

First Solve: 4 minutes (Team Aggregate)

This is probably the second easiest problem in the set but was solved first because more than likely, most teams read from the front of the set and saw it first. All the teams ended up solving this problem by the 1:04 mark into the contest.

Problem B: Bird Feeders

Solved by: 6 out of 18 teams

First Solve: 73 minutes (Team Detonate)

Team Detonate first solved this problem at the 73 minute mark, utilizing their knowledge of Segment Trees (not taught in the course), to knock out the problem. The rest of the teams discovered this problem much later and used the intended Binary Index Tree solution.

Problem C: Airport Charging Stations

Solved by: 17 out of 18 teams

First Solve: 16 minutes (Team Magistrate)

This problem was uncovered by Team Magistrate at the 16 minute mark. Once teams solved the first two problems in the set, many focused on this problem and realized that a straight greedy solution where we only visit one charging station is best. Once that observation is made, it's easy enough to just figure out which station is the best to visit. By the one hour mark, 12 teams out of 18 had solved this problem and all but one team was able to complete this problem by the end of contest.

Problem D: Freezing!

Solved by: 18 out of 18 teams

First Solve: 7 minutes (Team Watergate)

This is the easiest problem in the set but was discovered second because it's buried in the middle of the set. Team Watergate was the first to find the problem and solve it correctly. By the 20 minute mark more than half of the teams had solved the problem (teams have gotten much better at using the scoreboard) and by the 42 minute mark all teams had solved the problem!

Problem E: Company Merger

Solved by: 1 out of 18 teams

First Solve: 110 minutes (Team Magistrate)

This problem flummoxed teams more than expected. Before the first correct submission, 12 teams had previously made incorrect submissions on the problem, with one team submitting at least 9 times. Finally, Team Magistrate came through with the intended solution (using a sorted multiset either built in or adjusting a regular set to allow repeated values) at the 1:50 mark into the contest. In fact, they had roughly the right idea at the 30 minute mark but had some minor bugs to fix which they did over an hour after their last wrong submission on the problem. It's also possible that some teams got a WA because they did not use longs. (Note: if all companies merge and each company starts off with value 100,000, then that total overflows int.)

Problem F: Perplexing Puzzle

Solved by: 17 out of 18 teams

First Solve: 56 minutes (Team Aggregate)

While this problem was uncovered late in the game it turned out to be the fourth easiest problem in the set, roughly on the same level as Airport Charging Stations. (Both problems had 17 solves out of 18 at the 2:20 mark.) Of brute force problems, this one was quite straight forward and once teams spent time focusing on this problem, they were able to solve it, with a bulk of the solves (12 in total) coming in between the 1:30 and 2:19 mark.

Problem G: Jumping Robot

Solved by: 1 out of 18 teams

First Solve: 92 minutes (Team Aggregate)

The judges felt that this was the hardest problem in the set, but Team Aggregate was able to solve it just after the halfway mark in the contest. As their submission count indicates, there are quite a few details that must be managed in solving this problem. One key issue that doesn't usually come up in other DPs is that the Robot might overshoot its target, so our DP array actually has to be longer than where the target is set up.

Problem H: UFO Sighting

Solved by: 18 out of 18 teams

First Solve: 18 minutes (Team Create)

While geometry often flummoxes students, the class impressively handled this problem. It requires setting up some trigonometry on paper and then solving a system of two equations, which is best done by hand, and then having the final solution coded up. Team Create uncovered the problem extremely early at the 18 minute mark, and then gradually as teams solved the first two problems, many looked at this problem as either their third or fourth problem. Halfway through the contest, all but four teams had solved the problem. And most surprisingly, UFO became the third problem that was fully solved at the 2:44 mark when Team Illiterate got the problem on its first submission.

Contest Summary

The contest started off quickly with six teams getting on the board in the first 10 minutes, and before the 15 minute mark 2 teams, both Aggregate and Create, solving the two easiest problems in the set, We've got the Beat and Freezing! Also by the 15 minute mark, 6 more teams got on the scoreboard, so that two-thirds of all of the teams had solved at least one problem just quarter of an hour in.

Soon after the 15 minute mark, two new problems got exposed: Team Magistrate became the first team to solve Airport Charging Stations (16 minutes) and Team Create became the first team to solve UFO Sighting (18 minutes). Since Create had already solved the two easiest questions, they leaped into the lead as the first team with three problems, being the first team to guarantee a grade of at least 40%. At the 24 minute mark, Team Terminate solved Airport Charging Stations to become the second team to get to the three problem mark. At the half hour mark, 15 out of the 18 teams had solved the two easiest questions and only one team wasn't on the board. (They came late so they had less than 30 actual minutes at this point.)

As we came closer to the end of the first hour, Team Create got eclipsed. Several teams got to their third problem and at the 42 minute mark, the first team, Team Terminate hit the four problem mark. Teams Aggregate, Triumverate and Watergate soon followed, so that at the 49 minute mark, four teams had four problems solved, ensuring a grade of at least 50%. Of these four teams, Aggregate took the lead with an 18 point lead in penalty points over team Terminate. At the 47 minute mark, Discombobulate solved We've got the Beat so all teams had at least 2 problems, meaning that no one would be going home with a grade below 20%. As we approached the end of the hour, Team Aggregate solved its fifth problem, Perplexing Puzzle, retaining its lead and being the first team to solve this problem. Two minutes later, Team Vindicate also solved Perplexing Puzzle to move into second place at the end of the first hour. With two hours left, 2 teams had solved 5 problems, 5 teams had solved 4 problems, 8 teams had solved three problems and 2 teams had solved 2 problems.

Near the beginning of the second hour (1:04), Team Chocolate solved We've got the Beat making that the second problem solved by every team! Soon afterwards, Team Watergate solved Perplexing Puzzle to become the third team to reach 5 problems solved. At the 1:13 mark, a sixth problem was exposed as Team Detonate became the first team to solve the Bird Feeder question, a great accomplishment considering that this was based on the most difficult topic taught in the course. Even more surprising, their team solution didn't use the intended data structure of the Binary Index Tree, but instead used a more general Segment Tree. One of the members of the team had been learning this material from members of the UCF programming team, so that extra work turned out to be quite handy in this situation. At the 1:13 mark, Team Intimidate became the fifth team to solve Puzzle and the fifth team to reach 5 problems solved. At the 1:22 mark, Team Concatenate solved Charging so that all teams now had at least three problems. At this moment in time, the scoresheet had five teams with 5 problems, 6 teams with 4 problems and 7 teams with three problems, quite a neat result.

At this point the big question was: what would be the next problem exposed: Company Merger or Jumping Robot? At this point, 9 teams had already attempted Company Merger, each getting either a TLE, RTE or WA verdict, but only one team had attempted Robot, getting RTE and WA verdicts. Team Aggregate was very persistent on Robot, finally solving it on their sixth submission in under 30 minutes, becoming the first team to solve six problems at the 1:32 mark. Then, amazingly, just a few minutes later, at the 1:41 mark, Team Aggregate solved Bird Feeders, taking a commanding lead with 7 problems, with no teams at 6 problems. At this point, the only way in which any team would be able to beat them would be by solving the set. (All the teams at five at this point in time had incorrect submissions on problems which would put their penalty above Team Aggregate even if they were to submit right away.) Thus, unless something unlikely happens, at the 1:41 mark, Team Aggregate likely sealed their victory. Then, at the 1:50 mark, Team Magistrate uncovered the last problem, becoming the first team to solve Company Merger. Right at

the two hour mark, Aggregate still held a two problem lead over all teams. But this wasn't going to stay the case for long.

The third and final hour started off with a bang. Team Magistrate solved Perplexing Puzzle at 2:03, just 13 minutes after getting their fifth problem to vault into second place to be the second team with at least 6 problems solved. Soon afterwards, Team Detonate solved Perplexing Puzzle as well to be the third team with at least six problems solved. At the 2:23 mark, Team Concatenate solved Bird Feeders to get to six problems and fourth place. After the next 20 minutes, three more teams solved their sixth problem: Intimidate, Hyperfixate, and Procrastinate. Leading into the last 10 minutes, Aggregate still was the only team with 7 problems solved, followed by six teams with six problems solved, 10 teams with five problems solved and one team with 3 problems solved. Somewhat surprisingly, there were no correct submissions in the last ten minutes of the contest, so this is exactly how the final score ended.

Here are the team winners for the competition:

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| 1. Team Aggregate | 7 solved, 445 penalty |
| 2. Team Magistrate | 6 solved, 428 penalty |
| 3. Team Detonate | 6 solved, 433 penalty |

Honorable Mention goes to the following teams that also solved 6 problems:

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| 4. Team Intimidate | 6 solved, 447 penalty |
| 5. Team Hyperfixate | 6 solved, 511 penalty |
| 6. Team Concatenate | 6 solved, 525 penalty |
| 7. Team Procrastinate | 6 solved, 575 penalty |

Great job overall! We had more correct solves than we usually do in team contests and a great distribution of problems solved overall. We were a bit worried the set would get solved when Team Aggregate had all but one problem and 79 minutes left (their only issue is likely that they forgot to use longs on their last problem), and had they solved it, they would have deserved to get the set solve based on how well they performed in the second hour.

Hopefully you all enjoyed the competition!

Arup