The 2018 ICPC Asia Jakarta Regional Contest

Site Report, 3Sophomores

With our competitors being previous world finalists and strong teams that previously had us beat with a two or three problem advantage in other contests, we knew from the beginning that this was not going to be an easy site. We came in knowing we were an underdog, and that it would take an exceptionally strong showing to bag a medal, let alone gold.

Our team competed against 74 others, including top teams from universities such as Korea Advanced Institute of Science and Technology (KAIST), Kyoto University and Vietnam National University as well as local Indonesian universities Universitas Indonesia and Bina Nusantara University, among others.

As usual, the goal of the competition was to solve as many algorithmic problems as fast as possible. This year, we tackled twelve algorithmic increasingly difficult algorithmic problems, ranging from the most basic CS1010-level homework to geometric algorithms complicated to the point of absurdity. We had five hours to use everything we knew—data structures, constant optimizations, "randomized heuristic garbage"—to write efficient, correct code that passed all the test cases.

With the knowledge that we were not the best team, we decided to adopt the strategy of "follow the leader"—see what problems were already solved by other teams, and then solve them ourselves. While it meant that we were not going to win any "First to Solve" prizes, we had our eyes on the bigger prize: gold, and a ticket to the ACM-ICPC World Finals in Porto, Portugal.

The strategy worked very well! It allowed us to dodge a trap at the early stage of the contest—we saw that, despite many attempts from various teams, nobody had yet been able to solve the first problem, we decided that it probably wasn't as easy as it looked, and gave it more thought, confirming our suspicion that the "obvious" solution was actually incorrect. We kept our eyes on the leaderboard, and we saw that two other problems had been solved by other teams; we then switched our attention to those, and quickly followed with correct solutions of our own.

We continued the strategy throughout the mid-game, solving whatever the top Korean team had solved. We kept good pace and our position hovered between second and fifth, with speed being the only difference; the top team solving a problem gave us the much-needed confidence that our otherwise sub-optimal solution was probably correct. For example, I had an $O(n^3 \log n)$ solution for one of the medium-difficulty questions from the start of the contest, but we decided not to code it immediately due to fears that it might be too slow, favoring instead those for which we had "definitely correct", albeit longer, solutions; in the mid-game, however, after seeing that the top team had solved this problem, we decided that it would probably pass, and went ahead and coded it, solving it after a bit of debugging (an extremely subtle error—using a **while** loop instead of **do-while**) By the end of the fourth hour, we were at fifth place, with 8 problems solved; three teams above us all had 8 as well, with the dominant team having 10.

Our weekly late-night practice finally paid off at the final hour, where our team's dynamic really manifested. Problem C, the deciding problem in the contest, concerned constructing generalized **de Bruijn sequences**; it was solved by a perfect trifecta of Sergio's precise coding abilities, Lung Sin's algorithmic insights (reduction to Hierholzer's algorithm for Eulerian cycles for small cases) and my randomized heuristic garbage (for "large enough cases"); together, we were able to assemble a working solution that passed all test cases. We then quickly followed with an unsolved "easy" greedy problem. After that, we had fifteen minutes left and two untenable problems whose solutions we knew but could not feasibly code in time; we discussed some possible approaches but mostly spent the remaining time watching the leaderboard. We nervously watched as other teams with 8 solved problems solved other tasks; as our penalty was very high, other teams who solved 10 would surely rank above us. I remember clearly when one Korean team had made a submission for their tenth problem, and the scoreboard showed "0 + 1" (meaning they had made a submission—however, as the scoreboard is "frozen" after the fourth hour, we could not know whether or not it was correct), and then it changed to "0 + 2" at the last forty seconds (which meant that the original submission was incorrect and they had resubmitted) and the three of us rejoiced internally, knowing that the new submission was likely a desperate last-minute fix and had no chance of being correct.

The contest ended with much fanfare, and after a stunning performance by the host's choir, we tensely awaited the results; we eventually ended up third, bagging gold by the skin of our teeth, with only the dominant Korean team (with 11 problems) and the Japanese team (with 10 problems but lower penalty) ranking above us.

Overall, the contest went very well, and though I believe there are some aspects which can still be improved, such as our speed and accuracy, our performance was a prime example of what our team could achieve with perfect harmony.

As usual, we would like to thank our sponsors: our diamond donors, Indeed and Sea, as well as our bronze donors, Jump Trading and DRW for their support of our ACM ICPC activities. None of this would have been possible without them.

We would also like to thank our forbearing and encouraging coach Dr. Steven Halim, who supported us all the way and during tense moments provided some much-needed comic relief, and Phan Duc Nhat Minh, two-time ACM ICPC world finalist and Jakarta site champion one year prior, who provided us with lots of invaluable tips needed to crack the competition.

Closing ceremony, gold medalists

The spoils of war

RANK	TEAM	SCORE		A	B	C	D	E	F	G	H	I	J	K	L
1	**Deobureo Minkyu Party** Korea Advanced Institute of Science and T	**11**	1261	2/16	1/266	1/66	2/109	2	5/144	2/156	3/61	1/8	2/97	1/93	1/45
2	**earlybird** Kyoto University	**10**	1338	1/65	0	2/233	1/23	0	1/81	1/282	2/175	1/11	1/140	1/252	1/36
3	**3Sophomores** National University of Singapore	**10**	1581	1/31	0	9/260	5/73	0	1/280	4/179	2/103	1/9	1/83	2/168	1/55
4	**CMP** Korea Advanced Institute of Science and T	**9**	1032	2/25	0	2	2/33	0	1/162	2/204	2/112	1/11	1/75	2/252	2/38
5	**Supir Tayo** Universitas Indonesia	**9**	1405	2/133	0	3/278	3/52	0	4/248	2/238	1/169	2/6	1/59	0	1/22
6	**map** University of Engineering and Technology	**8**	727	1/36	0	0	2/49	0	1/163	1/201	4/118	1/4	1/52	7	1/24
7	**NTUSECURE** Nanyang Technological University	**8**	888	3/12	0	0	3/45	0	1/139	7/247	2/99	1/9	1/70	9	2/27
8	**YouR Lovely JatengPRiDe** Universitas Indonesia	**8**	1151	3/72	0	0	1/90	0	1/198	7/275	3/108	1/16	2/162	7	1/10
9	**semoga ayas juara versi empat** Universitas Indonesia	**8**	1218	2/95	0	0	5/74	0	2/238	3/256	1/130	1/10	2/189	0	1/46
10	**Kth-D Hyperprism** Bina Nusantara University	**8**	1274	6/55	0	1/248	2/50	0	20	7/288	4/134	1/8	1/70	0	5/41
11	**1T** Nanyang Technological University	**8**	1409	4/45	0	0	1/29	1	6/181	5/282	1/203	1/10	1/128	3	7/171
12	**ReFreshPHD** National University of Singapore	**7**	532	2/14	0	3	2/85	0	2/152	8	1/73	1/10	1/110	0	1/28

Final standings, top 12