

**Florida High School Programming Series
2020 Championship Round**

Contest Analysis by Arup Guha

Unlike last year, there were two differences:

- (1) Individual Competition This Year!
- (2) Much Higher Participation This Year!

99 students from 11 states and Singapore competed, easily the largest FHSPS Championship Round ever!!!

With so many participants and a wide range of ages, it was necessary for us to make a set of problems with a wide range of difficulty to keep everyone engaged. Naturally, with widening participation, we also had a few better competitors than we were used to, so unfortunately, there was little suspense in terms of the top two places in the contest. While we were able to challenge 97 of the competitors for nearly four hours, James R RHS TX and Euan O MCS Oxford both finished all twelve problems in roughly two hours. In a strange twist of fate, even though Euan finished all the problems first, James in an hour and 58 minutes, James, who finished Essential at the two hour two minute mark ended up with 588 penalty points to Euan's 591, one of the closest finishes we've had for this contest ever. James took the unorthodox step of solving X-ray first and initially falling behind before going through the set in order. Had he gone through the set in order, he would have had even fewer penalty points as those first few questions would have been finished earlier.

Following James and Euan, there was a friendly competition for the top placed Floridian student (and third and fourth place overall) between teammates Sathvik K TCHS FL and Natalie L TCHS FL. In the end, Sathvik was able to Essential with 5 minutes to spare to solve the set. Natalie ended up spending a bit too much time debugging X-Ray, but finished strong, solving it at the 3 hour 48 minute mark and also solving Scavenger 4 minutes later to solve all but Essential.

Overall, the break down of how many students solved how many problems is as follows:

Problems Solved	Number of Students
12	3
11	1
10	2
9	2
8	2
7	8
6	10
5	19
4	18
3	15
2	8
1	11

This was a great spread of problems solved! For all but the top two, the contest was able to nicely separate the top 10% of competitors, and a majority of the contestants were able to complete some of the problems, but eventually finding one in the set that was too challenging.

In terms of ordering the problems, the judges should have listened to the UCF Programming Team members who solved these problems on an internal practice Thursday night - they recommended that Board Game be moved to either the fifth or sixth location in the set since they felt it was harder than Grading and maybe even Raffle.

Here is a frequency chart showing the number of students who solved each question as well as the fastest correct submission time:

Problem	Number of Correct Submission	Fastest Correct Submission (Min)
toiletpaper	99	2
usernames	84	4
assignment	83	7
boardgame	26	13
grading	59	17
raffle	48	23
xray	13	12
jump	16	41
roads	12	63
ornaments	7	83
scavenger	5	100
essential	3	118

One other slight ordering issue was that it looks like X-Ray was a bit harder than Jump. Overall though, this is a nice distribution for each of the problems.

It was fun watching the contest from home and it was so nice to see so many students actively spending their time learning and practicing their competitive programming skills. We will most definitely be back next year, so if you're a junior or younger, look for the announcement from Mr. Dencker!!!

Arup Guha