

Senior Computer Team Orientation

SCT Officers

September 2019

1 Introduction

Welcome to Senior Computer Team, one of the coolest computer science clubs at TJ! We meet every Friday A block to learn algorithms and data structures and improve our problem solving skills via programming. Our focus is on the USA Computing Olympiad (USACO), but we also attend many other college competitions throughout the year. We look forward to having a great, fun year as a team!

- Sponsor: Mr. Eckel
- Captain: Richard Zhan
- Co-Captains: Patrick Zhang, Neeyanth Kopparapu
- Statistician: Havish Malladi

2 Schedule

SCT usually meets Friday A block (consider joining ICT, which meets B block). A typical block consists of two lectures on competitive programming topics. Students can choose which lecture to attend. Every few meetings, we will have an in-house contest, which will give members a chance to practice the material taught. For a more in-depth schedule, go to <https://activities.tjhsst.edu/sct/schedule.php> and for more general information visit <https://activities.tjhsst.edu/sct>

3 Contests

3.1 In-house Contests

In-house contests will be one of the most important ways to learn in SCT. We plan to have three to four in-house contests this year on specific skills to show students weaknesses and strengths of their algorithmic programming knowledge. Each in-house contest's format will be released before each contest.

3.2 USACO

USACO, the most popular and prestigious computing contest in the US, is administered online through four contests in December, January, February, and ending with an US Open in March. There are four divisions: Bronze, Silver, Gold, and Platinum. Everyone starts out in the Bronze Division and top competitors are selected for USACO camp. We highly recommend everyone to do this as much of our material overlaps with it, and one can get a lot out of the contests.

3.3 Travel/Additional Contests

We also participate in a variety of other contests, which are held in the spring. Each contest is formatted ACM-style, with the winners solving the most problems and ties broken by time. Teams of 3 to 4 are selected to participate at: UVA, VCU, and Codequest, and others. Additionally, every early December on TJ campus, VT hosts an online programming contest. You may form up to teams of three. This year, SCT is looking to expand the number of people we send to contests and the contests we attend, so be on the look out for information about

4 TJIOI

This year, TJIOI will be happening **in the fall** (tentatively November 9th) so we will be needing your help making the event a success! Look in the near future for updates regarding:

- Volunteering (You can get service hours and have fun!)
- Problem Writing and Organization

If you want to help with TJIOI, please ask/message an officer ASAP!

5 Topics

The main focus of the Intermediate and Advanced lectures is to help students promote to the Gold and Platinum divisions of USACO, respectively. We plan to cover all of the commonly seen topics for those two divisions before the first contest in December. After that, we will cover more advanced, Platinum-level topics.

Common USACO topics:

- Silver
 - Breadth First Search and Depth First Search
 - Floodfill
 - Prefix Sums
 - Greedy Algorithms
- Gold
 - Dynamic Programming
 - Graphs (Dijkstra's, Disjoint Set Union, Minimum Spanning Tree)
- Platinum
 - Advanced Dynamic Programming
 - Segment Trees and Ranged Queries
 - Math

6 Changes

This year, we are implementing a few changes compared to last year's SCT club.

- We plan to attend more travel contests this year to give more people an opportunity to attend these contests. In the near future, we will be releasing a list of "nearby" contests (within a four-hour drive of TJ).
- Guest lectures, which are required to run for an officer position, will not be clustered at the end of the year, but instead distributed throughout second semester to engage interests in the lectures. The requirements for running has also changed, and now includes:
 - 1 **solo** guest lecture
 - 12 SCT meetings attended

In order to vote, you will need to attend **6** SCT meetings.

7 Resources

7.1 Contact

Make sure to sign up for our mailing list and join our Facebook group! We will send out weekly announcements and updates. If you have any questions, feel free to contact us.

- Website: <https://activities.tjhsst.edu/sct/>
- Email: tjhsstsctcaptains@gmail.com
- Facebook Group: <https://www.facebook.com/groups/tjsct/>

7.2 Problem Archives

Solving problems is **the most important** part to learning new concepts. We will try to showcase a few problems relevant to each lecture topic at the end of lectures, but it is important that you do more problems!

- USACO Training Pages
- USACO Past Contests Archives (Effectively learn through explanations)
- Codeforces
- Online Judges (UVA, Kattis, CodeChef)

7.3 Competitive Programming Resources

- usaco.org
- codeforces.com
- <https://github.com/bqi343/USACO>
- geeksforgeeks.org
- *Competitive Programming* by Steve and Felix Hamlin
- *Algorithms* by Sedgewick and Wayne