PROJECT REPORT

On

COMPETITIVE PROGRAMMING SMP

Submitted to
IET (The Institute of Engineering and Technology)
NITK, Surathkal

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ACKNOWLEDGEMENTS

I am highly indebted to IET NITK, one of the leading clubs of our college, for letting me undertake (SMP) summer mentorship course with them. It was really a very nice experience as I learnt many new things in my summer break under the vast competitive programming topic. I would like to express my gratitude towards all the seniors who were always there to support and helped me in every possible way so that I could complete my SMP successfully. Assignments were given regularly which made this SMP a rich experience and a success.

ABSTRACT

The two-and-a-half-month long course started in the first week of May, during our summer break. Instead of wasting time this summer we got the chance to learn many new things which was not possible without the continuous support from our seniors. The course I took was competitive programming as it is very important for writing the codes efficiently.

During the first week we got to know about time complexity, Big-O notation etc. Then we learnt the following topics:

- Game theory
- Maths and linear data structures
- STL
- Greedy and bit manipulation
- Trees and graphs
- Dynamic programming
- Segment trees

All the sessions were conducted on slack which were very informative. Contests on Hackerrank were also conducted which gave a further interest and real application of what we learnt in CP.

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PROBLEM DEFINITION

Competitive programming is solving well-defined problems by writing computer programs under specified limits. Unlike other scenarios of programming CP requires you to write code under various restrictions, like execution time, memory limits of your program. Also, we are required to solve maximum number of problems in the stipulated time.

It is an excellent way of improving in programming skills. Irrespective of the problem category, the process of solving a problem can be divided into two broad steps: constructing an efficient algorithm, and implementing the algorithm in a suitable programming language. These are the two most commonly tested skills in programming competitions.

OVERVIEW

There was a total of 10 sessions on competitive programming which were conducted on slack. Also, there were two contests on hackerrank and a final contest. All these were conducted in a span of two and a half months, starting from May first week. The sessions were very much informative, seniors took a lot of interest in conducting these sessions. They regularly asked for any doubts and always cleared them. It takes a lot of patience, hats off to them.

Assignments were given after almost every session which helped in grasping the topic better. A total of 6 assignments and around 12-13 questions were given. We had to submit the assignments on github.

I had never done any CP before this summer and was naive in this subject. By the help of this SMP, I gained a lot of interest in competitive programming and got to know a lot many new terms. It helped me in writing the codes efficiently and I learned to submit codes on github which I had not done before.

All this was not possible without the continuous support of seniors who helped in making this SMP a success

CODES

Link to the google drive containing links for the assignment and contest problems is given below:

https://docs.google.com/document/d/1voLSUYJhcmdVokc85OsMpQq4i9nx9Qv60nHY1MPIgCc/edit?usp=sharing

FUTURE WORK

The Summer Mentorship project generated a lot more interest in my subject. It made me aware that the scope of Competitive programming is immense.

Now that I have learned the basics of competitive programming, I will try to solve problems regularly online and keep practicing. I’m sure it would help me during placement interviews and tests.