

# **ROADMAP FOR COMPETITIVE CODING**

Let's start with some of the some FAQs:

1. What is Competitive programming?
2. Why should I do Competitive Programming?
3. How to start with Competitive Programming?
4. Which is the best language for Competitive Programming?
5. I know a language, where should I practise that?
6. What is data structure and algorithm and How are they used in Competitive Programming?
7. From where I can learn Data Structure and Algorithm and also where to practise them?
8. What kind of Mathematics is used in Competitive Programming and what are the sources from where I can learn this?
9. How to start with a contest and what is rating , how it changes?
10. Which is the best platform for competitive Programming?
11. Where can I see our College students Progress on different platforms?
12. List of youtubers I should follow?
13. Is there something for mathematics lovers ?
14. How I will get to know the list of contest schedules?

## **1.What is Competitive programming?**

**Competitive programming** is a mind sport, involving participants trying to program according to provided specifications.

The aim of competitive programming is to write source code of computer programs which are able to solve given problems.

This shows how quick and efficiently One can solve a problem (may be sometimes a real world problem) within some constraints with them.

## **2.Why should I do Competitive Programming?**

Competitive programmers are known for their problem solving skills. Like developers show their skills by making different projects, competitive programmers show their talent by taking part in different challenges which sites like Codeforces, Codechef, Topcoder, Hackerrank, Hackerearth and many more host frequently.

This will make your concepts better , you will have good command on a language and data structure & Algorithm.

In placement your competitive coding profile matters a lot. If you win a contest then you can have prizes also.

### **3.How to start with Competitive Programming?**

- a) If you are absolutely new to competitive programming you have to make command of any of your favourite languages( it can be c++, java & python) in which you feel comfortable.
- b) Learn some of the basic concepts of data structure(array, list, stack, queue etc.) and algorithm(searching, sorting, reverse etc)
- c) Number theory(set , fibonacci series, prime number etc).
- d) Knowledge of standard libraries , this will help you alot.(if anyone who is using c++ then its standard library is `#include<bits/stdc++.h>`) . with the help of these libraries you can perform some of the operations within a single line.  
Ex- for sorting you can use sort function - `sort(arr, arr+n)`....where arr is array & n is length of array.

Video link - <https://www.youtube.com/watch?v=xAeiXy8-9Y8>

### **4.From where I learn the language?**

There are several of free courses on udemy and on youtube too. Follow any on youtube and start learning the language. Make small programs in the beginning try to minimise the syntax error.

### **5. I know a language, where should I practise that?**

Here are some the links of some platforms where you can practice your language , also if you are stuck somewhere , there is editorial also. Just go through that editorial and to again practise . The more you Practise the more you will develop confidence on it. Geeks for Geeks and Hackerrank are the two good platforms for this purpose.

C++ - <https://practice.geeksforgeeks.org/explore/?category%5B%5D=CPP&page=1>  
<https://www.hackerrank.com/domains/cpp>  
Java - <https://practice.geeksforgeeks.org/explore/?category%5B%5D=Java&page=1>  
<https://www.hackerrank.com/domains/java>  
C - <https://www.hackerrank.com/domains/c>  
Python - <https://www.hackerrank.com/domains/python>

## 6. What is data structure and algorithm and How are they used in Competitive Programming?

**Data Structure** is a way of collecting and organising **data** in such a way that we can perform operations on these **data** in an effective way.

**Algorithm** is a step-by-step procedure, which defines a set of instructions to be executed in a certain order to get the desired output. **Algorithms** are generally created independent of underlying languages, i.e. an **algorithm** can be implemented in more than one programming language.

There are some specifications with every data structure. These data structures are well defined with their properties and function . you can use them and perform some of the operations easily.

## 7. From where I can learn Data Structure and Algorithm and also where to practise them?

Well i have a free course of data structures and algorithm for you.

Here is the link

[-https://www.learningcrux.com/course/mastering-data-structures-algorithms-using-c-and-c](https://www.learningcrux.com/course/mastering-data-structures-algorithms-using-c-and-c)

Also there are two books which you can follow

1. Narshima Karumanchi
2. Competitive Programmer's Handbook

Some documentation

<http://www.cplusplus.com/reference/>  
<https://cp-algorithms.com/>

Both books are available on internet you can download from there. Also i will share the pdf of both books also.

Also you can practice here -

[https://www.codechef.com/LEARNDSA?itm\\_campaign=navmenu](https://www.codechef.com/LEARNDSA?itm_campaign=navmenu)

<https://practice.geeksforgeeks.org/topic-tags/>

<https://www.hackerrank.com/domains/algorithms>

<https://www.hackerrank.com/domains/data-structures>

## **8.What kind of Mathematics is used in Competitive Programming and what are the sources from where i can learn this?**

Number Theory and set are used in Competitive Programming.

I will share a book for this ..

Also here is youtuber love bubber who explained this well -

Link - <https://www.youtube.com/watch?v=gREDFgHL9m4&feature=youtu.be>

<https://www.youtube.com/watch?v=GwVDCi8CCAI&feature=youtu.be>

## **9. How to start with contest and what is rating , how it changes?**

Once you got familiar with any programming language and some basic concepts of data structure and number theory you can start participating in the contest.

**Codechef have 3 contest in one month**

**Long challenge** - (rated) - 10 days (8-10 problem) - (beginning of the month)

**Cook off** - (rated) - 3 hours (4-5 problem) - (3rd week)

**Lunch time** - (rated) - 3 hours (4-5 problem) - (last week of the month)

**Codeforces have 8 contest in one month**

**Educational round**

**Codeforces round Div1/Div2/Div3**

**Google have 2 annual contest and 8 monthly contest**

**Google code Jam** - (march)- (solo)

**Google Hash Code** - (february) - (team)

**Google Kickstart** - (monthly) - (solo) -(3 hours)

After participating in the contest , According to your rank in that contest you will be rated with some of the points. If good performance then it will be positive and if not then it will be negative.

## **10. Which is the best platform for competitive Programming?**

There can be lot of points on which we can compare the coding platform.  
One of them is on the basis of ranked contest users

**NOTE: While making ID on any platform use your college name as - Rajasthan Technical University Kota**

Rank	Site	Ranked Contest Users <sup>1</sup>
1	 HackerRank	175.0K
2	 CODECHEF	143.0K
3	 LeetCode	71.7K
4	 CODEFORCES	46.0K
5	 hackerearth	40.4K
		

Everything is self explanatory according to this image

## 11. Where I can see our College students Progress on different platform?

See our college participants on different different platform

Codechef -

[https://www.codechef.com/ratings/all?filterBy=Country%3DIndia%3BINstitution%3DRajasthan%20Technical%20University%2C%20Kota&order=asc&sortBy=global\\_rank](https://www.codechef.com/ratings/all?filterBy=Country%3DIndia%3BINstitution%3DRajasthan%20Technical%20University%2C%20Kota&order=asc&sortBy=global_rank)

Geeks for Geeks -

<https://auth.geeksforgeeks.org/college/rajasthan-technical-university-rtu-kota>

Codeforces -

<https://codeforces.com/ratings/organization/20614>

Hackerrank -

[https://www.hackerrank.com/leaderboard?filter=Rajasthan+Technical+University%2C+Kota&filter\\_on=school&page=1&track=cpp&type=practice](https://www.hackerrank.com/leaderboard?filter=Rajasthan+Technical+University%2C+Kota&filter_on=school&page=1&track=cpp&type=practice)

## **12.List of youtubers I should follow?**

1. Errichto
2. Love bubber
3. Codeblocks
4. Rachit Jain
5. Gaurav Sain
6. William lin
7. Code NCode

## **13. Is there something for mathematics lover ?**

Yes for mathematics lover there is a website project euler on which there are approximately 700 questions which can only be solved with the help of programming

Here is the link - <https://projecteuler.net/>

A website that will answer all your sequence - <https://oeis.org/>

Video -<https://www.youtube.com/watch?v=vKPRRUWbWAQ&feature=youtu.be>

## **14.How I will get to know the list of contest schedules?**

Here is the link below which will provide you the list of currently running contest along with their platform detail.

<https://clist.by/>