

RoadMap to Competitive Coding

Step 1 (Practice basic questions) - 30 days

- Choose a language (C++, Java, Python) and learn basic syntax.
- Start practicing questions online
- Solve very very simple questions on any website (CodeChef, Hackerrank, HackerEarth)
- Take a target of 50 questions to solve(very easy one) in 30 days.

Questions Links -

https://www.codechef.com/problems/school/?itm_medium=navmenu&itm_campaign=problems
(beginner and easy section)

Step 2 (Time complexity + basic Recursion) - 5 days

- Session -
https://www.youtube.com/watch?v=Xi6RqhgeHjs&list=PLhUBmaJES_g-41r_z-kMGWqQ4Iz-z7Oyo&index=3
https://www.youtube.com/watch?v=ztYFFdsGwUg&list=PLhUBmaJES_g-41r_z-kMGWqQ4Iz-z7Oyo&index=5

Step 3 (STL/Collections + Contests) - 10 days

- Its time to level up your coding by learning tools basically STL in c++ and Collections in Java.
- Also start giving online coding contests (At least codechef long+short and codeforces DIVs)
- Learn the STL from here -

Session 1 - <https://www.youtube.com/watch?v=Bm7Msg2Osu4>

Session 2 - <https://www.youtube.com/watch?v=YnB-2CK2c7k>

Questions to practice -

- <https://www.hackerrank.com/challenges/cpp-maps/problem>
- <https://www.hackerrank.com/challenges/cpp-sets/problem>
- <https://www.hackerearth.com/problem/algorithm/shikhar-stl/>
- <https://www.codechef.com/problems/KJCP02>

- <https://www.codechef.com/problems/CSS2>
- <https://www.codechef.com/LRNSA02/problems/NOTALLFL>
- <https://www.codechef.com/JUNE20B/problems/CHFICRM>
- <https://www.codechef.com/DEC14/problems/CAPPLE/>

Step 4 (Topic Wise problems + Codeforces)

- **Number Theory (15-20 days)**

- Time to start learning topic wise
- **Number Theory playlist**

- **Number Theory Basics**

Session -

https://www.youtube.com/watch?v=XKd3voUwj04&list=PLhUBmaJES_g_SDTERARrkld6jHkIHHSHi&index=1

- **Sieve of Eratosthenes**

Session -

https://www.youtube.com/watch?v=XKd3voUwj04&list=PLhUBmaJES_g_SDTERARrkld6jHkIHHSHi&index=1

https://www.youtube.com/watch?v=Eq5ky-XcEYg&list=PLhUBmaJES_g_SDTERARrkld6jHkIHHSHi&index=3

Practice Problems

<https://www.spoj.com/problems/APS/>

<https://www.spoj.com/problems/AFS>

<https://www.spoj.com/problems/NDIV/>

<https://www.spoj.com/problems/CUBEFR/>

<https://www.spoj.com/problems/NOSQ/>

<https://www.spoj.com/submit/TWOSQRS>

- **ETF (Euler Totient Function)**

Sessions -

https://www.youtube.com/watch?v=XKd3voUwj04&list=PLhUBmaJES_g_SDTERARrkld6jHkIHHSHi&index=1

https://www.youtube.com/watch?v=d5FICz4nRiU&list=PLhUBmaJES_g_SDTERARrkld6jHkIHHSHi&index=5

Practice Problems -

<https://www.spoj.com/problems/ETF/>
http://lightoj.com/volume_showproblem.php?problem=1007

- **Binary Exponentiation (Very Important)**

Session - <https://www.youtube.com/watch?v=UicoOgR4LVY>

Problems -

- Discussed in the above session

- **Modulus Properties (Very Important)**

Session - <https://www.youtube.com/watch?v=zJwct7qni2c>

- **Bit Manipulation (5-10 days)**

Session - <https://www.youtube.com/watch?v=md2Bn0zK6sc>

Practice Problems -

<https://www.hackerearth.com/problem/algorithm/chotu-and-sabrina-1/>

<https://www.spoj.com/problems/OLOLO/>

<https://www.spoj.com/problems/FRND/>

<https://www.codechef.com/problems/MARCHA1>

<https://www.spoj.com/problems/NR2/>

- **Binary Search (7-10 days)**

- It's a very important topic in CP as well as for interviews.

Session - 1

<https://www.youtube.com/watch?v=JOONXgz0zeM>

Session - 2

<https://www.youtube.com/watch?v=jg0HOWm7OZc>

Practice Problems -

<https://www.spoj.com/problems/AGGRCOW/>

<https://www.spoj.com/problems/EKO>

<https://www.spoj.com/problems/PIE>

<https://www.spoj.com/problems/ABCDEF/>

<https://www.interviewbit.com/problems/painters-partition-problem/>

<https://www.spoj.com/problems/SUMFOUR/>

<https://leetcode.com/problems/count-complete-tree-nodes/>

<https://www.spoj.com/problems/BALL0T/>
<https://www.geeksforgeeks.org/n-th-root-number/>

● Graph Theory (20 days)

- Detailed Syllabus -

[https://drive.google.com/file/u/2/d/1H4NB3ITmeimAJcJmj8AGcMxaRQ9qCnL4/vi
ew](https://drive.google.com/file/u/2/d/1H4NB3ITmeimAJcJmj8AGcMxaRQ9qCnL4/vi
ew)

Session 1

<https://www.youtube.com/watch?v=HXh0kn3TL5g>

Session 2 + practice problems

- <https://www.youtube.com/watch?v=VM6EGekmwuA>
- <https://www.spoj.com/problems/CAM5/>
- <https://www.spoj.com/problems/PT07Y/>
- <https://www.spoj.com/problems/PT07Z/>
- <https://www.spoj.com/problems/PPATH/>
- <https://codeforces.com/problemset/problem/520/B>

Session 3

<https://www.youtube.com/watch?v=LQ4Gr7Imn0U>

Practice Problems

- <https://www.geeksforgeeks.org/find-the-ordering-of-tasks-from-given-dependencies/>
- Leaf nodes pluck problem
- <https://codeforces.com/contest/510/problem/C>

● Dynamic Programming (25 days)

Practice Problems

- <https://www.codechef.com/problems/SPIDY2>
- <https://www.spoj.com/problems/BYTESM2/>
- <https://www.spoj.com/problems/MISERMAN/>
- <https://www.spoj.com/problems/FARIDA/>
- <https://www.spoj.com/problems/MCOINS/>
- <https://www.spoj.com/problems/NOCHANGE/>
- <https://www.spoj.com/problems/CRSCNTRY/>
- <https://www.spoj.com/problems/COINS/>
- <https://www.spoj.com/problems/PARTY/>
- <https://www.spoj.com/problems/ABA12C/>

- <https://www.spoj.com/problems/MIXTURES>
- <https://www.spoj.com/problems/DIEHARD/>
- <https://www.spoj.com/problems/GSCANDY/>
- <https://www.spoj.com/problems/LISA/>
- <https://www.spoj.com/problems/MARTIAN/>
- <https://www.spoj.com/problems/MKBUDGET/>
- <https://www.spoj.com/problems/MMAXPER/>
- <https://www.spoj.com/problems/MAIN72/>
- <https://www.spoj.com/problems/MAXWOODS/>
- <https://www.spoj.com/problems/LKS/>
- <https://www.spoj.com/problems/EDIT/>
- <https://www.spoj.com/problems/ADVEDIST/>
- <https://www.spoj.com/problems/ROCK/>
- <https://www.spoj.com/problems/TWENDS/>

- Step 5 (Trees and LinkedLists)

- Interview bit
- GeeksForGeeks
- Karumanchi Books
- Recently Asked Interview Questions

- Step 6 (Advanced DataStructures and Algorithms)

- Segment Trees
- Trie Tree
- Suffix Array
- Digit DP
- DP+Bitmasking

