Newbie

* Master 1 programming lang
* Learn time & space complexity
* Learn STL
* Math – HCF, LCM, primes, divisors, multiples, modular arithmetic
* Recursion – vv. imp

Tips

* Don’t run after topics
* Focus on building implementation skills
* Don’t get disheartened

Pupil

* Binary search advanced, monotonic functions <https://www.youtube.com/watch?v=g3tddNvVLSg>

<https://www.youtube.com/watch?v=TiQ_W2qG3kU>

* Number theory: B-expo, sieve of erathothenes, Euclidean algorithm, prefix sum
* Greedy – standard greedy/non standard greedy
* Bit manipulation tricks – TLE eliminators channel

[Bit manipulation - Algorithms for Competitive Programming (cp-algorithms.com)](https://cp-algorithms.com/algebra/bit-manipulation.html)

* Solve ad-hoc problems
* Up-solve contests
* Give enough contests

Specialist

* 2pointer, sliding window, adv. Number theory, fermat’s & Euler’s theorem
* Mod inverse & combinatorics
* DP – standard and non-standard ( resources - [Youtube](https://www.youtube.com/playlist?list=PLAj_13N2fk-RA6wvOUmWOyUeL9zmWFJoI) )
* DP with bit-masking
* Graphs – DFS, BFS & shortest path algo
* Trees – basics, subtree precomputation, binary uplifting
* Bonus – segment tree or sparse tables, fenwick trees.
* String – string hashing, Tries.
* Tips – start proving, start reading blogs