<https://discuss.codechef.com/questions/18752/what-are-the-must-known-algorithms-for-online-programming-contests>

I've been practicing at Codechef for a while and now I'm gradually moving toward medium/hard problems. However many algorithms at these levels are very difficult to predict, and I was always stuck because I'm not aware of them. So I open this topic, my hope is to have a wish-list of most used algorithm for online programming contest that I can look up for reference. Here is my short-list up to now:

1. Segment tree (with lazy propagation)
2. Interval Tree
3. Binary Indexed Tree
4. [Fast Modulo Multiplication (Exponential Squaring)](http://discuss.codechef.com/questions/20451/a-tutorial-on-fast-modulo-multiplication-exponential-squaring)
5. Heuristic Algorithms
6. KMP string searching
7. Manacher's Algorithm
8. Union Find/Disjoint Set
9. Trie
10. Prime Miller Rabin
11. [Matrix Recurrence + Fast Modulo Multiplication for counting](http://discuss.codechef.com/questions/2335/building-up-the-recurrence-matrix-to-compute-recurrences-in-ologn-time?page=1#20529)
12. Stable Marriage Problem
13. [Extended Euclid's algorithm](http://discuss.codechef.com/questions/20842/a-tutorial-on-the-extended-euclids-algorithm)
14. Ternary Search
15. Fast Fourier Transform for fast polynomial multiplication
16. Djikstra's algorithm, Bellman-ford algorithm, Floyd-Warshall Algorithm
17. Prim's Algorithm, Kruskal's Algorithm
18. RMQ, LCA
19. Flow related algorithms, assignment problem, Hungarian algorithm
20. Bipartite matching algorithms
21. Heavy-light decomposition
22. Sweep line algorithm
23. Z algorithm
24. Convex Hull
25. [Suffix Arrays](http://discuss.codechef.com/questions/21385/a-tutorial-on-suffix-arrays)
26. LCP
27. Suffix Tree
28. Gaussian Elimination
29. Numerical Integration/Differentiation
30. Line Clipping
31. Advanced Maths Ad-Hoc problems
32. Aho–Corasick string matching algorithm;
33. [Calculate nCr % M Lucas's Theorem](http://discuss.codechef.com/questions/3869/best-known-algos-for-calculating-ncr-m)
34. Heavy Light decomposition in trees
35. Inverse Modulo operations
36. Pollard Rho Integer Factorization
37. Catalan Numbers