

# DYNAMIC PROGRAMMING DECODED ( RIDDHI DUTTA )

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DISCLAIMER - The problems have been sorted based on relevance and difficulty.  
Similar problems are grouped together.

## 1D - DP

1. <https://leetcode.com/problems/fibonacci-number/>
2. <https://practice.geeksforgeeks.org/problems/count-ways-to-reach-the-nth-stair-1587115620/1> (VVI for Interviews)
3. <https://www.geeksforgeeks.org/ways-paint-stairs-two-colors-two-adjacent-not-yellow/> (Asked in Amazon)
4. <https://www.hackerearth.com/problem/algorithm/utkarsh-and-jumps/>
5. <https://practice.geeksforgeeks.org/problems/bbt-counter4914/1>
6. <https://leetcode.com/problems/unique-binary-search-trees/> (Asked in Amazon and Google)
7. <https://www.hackerearth.com/practice/algorithms/dynamic-programming/introduction-to-dynamic-programming-1/practice-problems/algorithm/roy-and-coin-boxes-1/>
8. <https://www.hackerearth.com/practice/algorithms/dynamic-programming/introduction-to-dynamic-programming-1/practice-problems/algorithm/number-of-rs-1/>
9. <https://leetcode.com/problems/perfect-squares/> (Asked in Amazon and Google)
10. <https://leetcode.com/problems/arithmetic-slices/> (Asked in Amazon)
11. <https://practice.geeksforgeeks.org/problems/consecutive-1s-not-allowed1912/1>
12. <https://leetcode.com/problems/house-robber/> (VVVVVI for Interviews)
13. <https://leetcode.com/problems/house-robber-ii/>
14. <https://leetcode.com/problems/longest-increasing-subsequence/> (VVVI but learn the DP solution only for clearing your concept as it will help you to solve similar kind of problems. However in a real interview there is an  $O(N \log N)$  solution which will be expected. DP Solution will cost you  $O(N^2)$ )
15. <https://practice.geeksforgeeks.org/problems/box-stacking/1> (Asked in Amazon)
16. <https://www.geeksforgeeks.org/maximum-length-chain-of-pairs-dp-20/> (Asked in Amazon)
17. <https://practice.geeksforgeeks.org/problems/longest-bitonic-subsequence0824/1> (Asked in Amazon)

18. <https://www.codechef.com/problems/ALTARAY>
19. <https://www.codechef.com/ZCOPRAC/problems/ZCO14002>
20. <https://www.codechef.com/ZCOPRAC/problems/ZCO14004/>
21. <https://www.codechef.com/ZCOPRAC/problems/ZCO12004/>
22. <https://www.codechef.com/INOIPRAC/problems/INOI1301> (Check my well explained article)
23. <https://leetcode.com/problems/decode-ways/> (VVI , asked in Amazon , JP Morgan , Facebook etc)
24. <https://leetcode.com/problems/best-time-to-buy-and-sell-stock-iii/> (VVI for Interviews)
25. <https://leetcode.com/problems/best-time-to-buy-and-sell-stock-iv/> (VVI for Interviews)
26. <https://leetcode.com/problems/maximum-product-subarray/> (VVI for Interviews)
27. <https://leetcode.com/problems/word-break/> (Asked in Amazon and Facebook)
28. <https://leetcode.com/problems/jump-game-ii/> (Asked in Amazon)
29. <https://www.hackerrank.com/challenges/equal/problem>
30. <https://codeforces.com/problemset/problem/455/A>
31. <https://www.spoj.com/problems/CPCRC1C/>
32. <https://www.codechef.com/problems/DELISH>
33. <https://www.codechef.com/problems/DBOY>
34. <https://codeforces.com/problemset/problem/768/C>
35. <https://www.codechef.com/problems/GRID>
36. <https://www.codechef.com/problems/FROGV>

## 2D - DP

1. <https://www.geeksforgeeks.org/0-1-knapsack-problem-dp-10/> (VVVVVI for Concept Building)
2. <https://www.spoj.com/problems/PARTY/>
3. <https://leetcode.com/problems/coin-change/> ( VVVI for Interviews)
4. <https://www.geeksforgeeks.org/subset-sum-problem-dp-25/> (VVVI for Concept Building)
5. <https://leetcode.com/problems/partition-equal-subset-sum/> (Asked in Amazon and Facebook)
6. <https://www.spoj.com/problems/MISERMAN/>
7. <https://www.codechef.com/problems/XORSUB>
8. <https://www.spoj.com/problems/BVAAN/>
9. <https://codeforces.com/problemset/problem/777/C>
10. <https://www.hackerearth.com/practice/algorithms/dynamic-programming/2-dimensional/practice-problems/algorithm/vanya-and-gcd-array/description/>
11. <https://leetcode.com/problems/triangle/submissions/>
12. <https://www.spoj.com/problems/SQRBR/>
13. <https://www.spoj.com/problems/MPILOT/>
14. <https://practice.geeksforgeeks.org/problems/mobile-numeric-keypad5456/1>
15. <https://www.geeksforgeeks.org/egg-dropping-puzzle-dp-11/>

## String - DP

1. <https://leetcode.com/problems/longest-common-subsequence/> (VVVI for Interviews)
2. <https://www.geeksforgeeks.org/shortest-common-supersequence/>
3. <https://www.codechef.com/problems/STRMRG>
4. <https://www.hackerrank.com/challenges/abbr/problem>
5. <https://www.geeksforgeeks.org/edit-distance-dp-5/> (VVVI for Concept Building)
6. <https://leetcode.com/problems/wildcard-matching/>
7. <https://leetcode.com/problems/regular-expression-matching/>
8. <https://leetcode.com/problems/longest-palindromic-subsequence/> (VVI for Interviews)
9. <https://leetcode.com/problems/concatenated-words/> (Asked in Amazon)
10. <https://leetcode.com/problems/distinct-subsequences/>
11. <https://www.geeksforgeeks.org/word-wrap-problem-dp-19/>

## Matrix - DP

1. <https://leetcode.com/problems/count-square-submatrices-with-all-ones/>
2. <https://practice.geeksforgeeks.org/problems/maximum-sum-rectangle/0> (DP With Kadane....VVVI)
3. <https://practice.geeksforgeeks.org/problems/path-in-matrix3805/1> (VVI for Interviews)
4. <https://leetcode.com/problems/unique-paths/> (DP is not the optimal solution for this problem but solve it to clear your concept on 2D DP.)
5. <https://leetcode.com/problems/dungeon-game/>
6. <https://www.spoj.com/problems/FARIDA/>
7. <https://www.geeksforgeeks.org/matrix-chain-multiplication-dp-8/>
8. <https://www.geeksforgeeks.org/boolean-parenthesization-problem-dp-37/>
9. <https://leetcode.com/problems/palindrome-partitioning/> (Asked in Amazon and Google)
10. <https://www.geeksforgeeks.org/gold-mine-problem/>

N.B - There are advanced topics like DP with Bitmasks , DP on trees etc which are generally not asked in interviews and hence I have chose not to include them. However they are useful to know for Competitive Programming. Learn those concepts only after you are comfortable with the above questions.