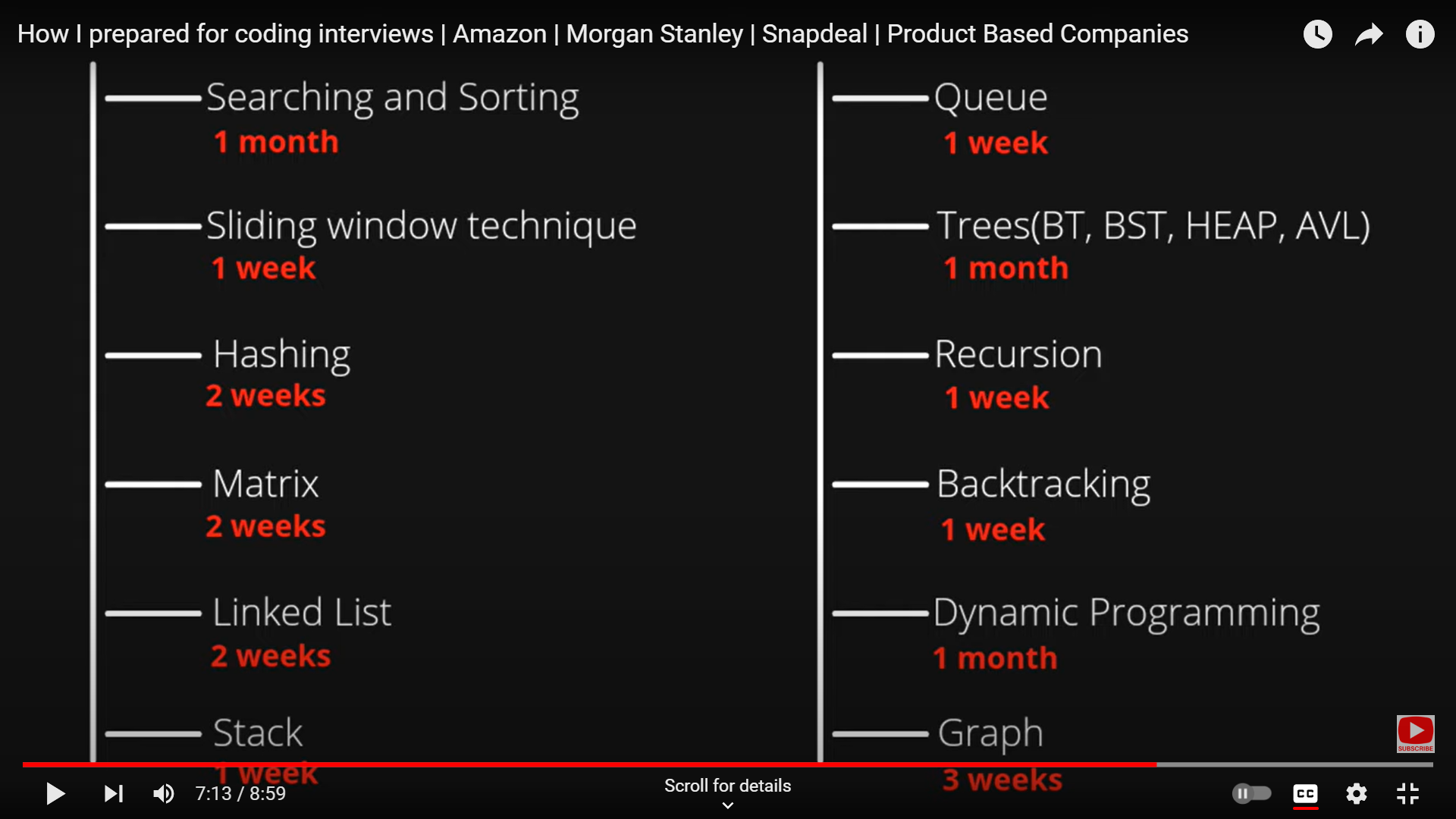
# Study Material

## <https://www.youtube.com/watch?v=npxJuB2JpZQ>



**Prerequisites**

## Algorithms

* Searching
  + Linear search – Unsorted Array
  + Binary search – Sorted Array
* Sorting
  + Bubble, TC for first 3 O(n2)
  + Selection
  + Insertion
  + Merge, TC of last 3 O(n log n)
  + Quick
  + Heap
* Array
  + Difference in sub array, sub sequence
  + Algorithms
    - KADAN’s Algorithm
    - Sliding Window
    - 2 Pointer Approach
  + 2D Array
    - Input, Output, Print it
    - Print in spiral
    - Transpose
    - Reverse
    - Rotate
* String
  + Input, Output, Print, How Stored in Memory
  + Eg. Know palindrome, longest subsequence palindrome
  + Substring (You can’t remove characters from middle), subsequence (Can remove characters from middle but order should not be changed)
* Recursion and Backtracking
  + Too many questions no need to solve all
* Stacks & Queue : Imp in BFS, DFS
  + How to implement it from scratch
  + K Stack in 1 Array
* Linked List and Doubly Linked List
  + How to iterate it
  + Take input, display them
  + How stored in memory
  + Reverse it, Reserve at pairs of K element at once
  + Last and Slow pointer approach to find middle of LL, or to find loop of a linked list and then remove it
  + Merge sort and quick sort in linked list
  + Copy a linked list to a random pointer
  + LRU CACHE
* Tree
  + (Binary Tree)
    - Preorder
    - Inorder
    - Postorder
    - Lever order
    - Write them recursively
    - Iteratively
    - Depth of Tree
    - Diameter of Tree
    - Left View
    - Top View
    - Bottom View
    - Mirror, Copy
    - Lowest common ancestor
    - Algorithm based on BFS & DFS aligned towards graph
  + Binary Search Tree
    - All iteration ways
    - Given binary tree is BST or not
    - LCA
    - Array sorted to BST
    - Kth Smallest and Largest element
  + Tries
    - Build from scratch
    - Add words
    - Search for words
* Heap
  + Build from scratch
* Dynamic Problem

……….

**Arrays**

* [https://leetcode.com/problems/two-sum/](https://leetcode.com/problems/two-sum/?ref=localhost)
* [https://leetcode.com/problems/3sum/](https://leetcode.com/problems/3sum/?ref=localhost)
* [https://leetcode.com/problems/contains-duplicate](https://leetcode.com/problems/contains-duplicate?ref=localhost)
* [https://leetcode.com/problems/merge-intervals/](https://leetcode.com/problems/merge-intervals/?ref=localhost)
* [https://leetcode.com/problems/kth-largest-element-in-an-array/](https://leetcode.com/problems/kth-largest-element-in-an-array/?ref=localhost)
* [https://leetcode.com/problems/maximum-subarray/](https://leetcode.com/problems/maximum-subarray/?ref=localhost)
* [https://leetcode.com/problems/maximum-product-subarray/](https://leetcode.com/problems/maximum-product-subarray/?ref=localhost)
* [https://leetcode.com/problems/best-time-to-buy-and-sell-stock](https://leetcode.com/problems/best-time-to-buy-and-sell-stock?ref=localhost)
* [https://leetcode.com/problems/container-with-most-water/](https://leetcode.com/problems/container-with-most-water/?ref=localhost)
* [https://leetcode.com/problems/trapping-rain-water/](https://leetcode.com/problems/trapping-rain-water/?ref=localhost)
* [https://leetcode.com/problems/subarray-sum-equals-k](https://leetcode.com/problems/subarray-sum-equals-k?ref=localhost)
* [https://leetcode.com/problems/minimum-size-subarray-sum/](https://leetcode.com/problems/minimum-size-subarray-sum/?ref=localhost)
* [https://leetcode.com/problems/median-of-two-sorted-arrays](https://leetcode.com/problems/median-of-two-sorted-arrays?ref=localhost)
* [https://leetcode.com/problems/sort-colors/](https://leetcode.com/problems/sort-colors/?ref=localhost)
* [https://leetcode.com/problems/majority-element/](https://leetcode.com/problems/majority-element/?ref=localhost)
* [https://leetcode.com/problems/longest-consecutive-sequence](https://leetcode.com/problems/longest-consecutive-sequence?ref=localhost)
* [https://leetcode.com/problems/longest-substring-without-repeating-characters](https://leetcode.com/problems/longest-substring-without-repeating-characters?ref=localhost)
* [https://leetcode.com/problems/minimum-window-substring](https://leetcode.com/problems/minimum-window-substring?ref=localhost)
* [https://leetcode.com/problems/permutation-in-string/](https://leetcode.com/problems/permutation-in-string/?ref=localhost)

**2D Arrays**

* [https://leetcode.com/problems/search-a-2d-matrix/](https://leetcode.com/problems/search-a-2d-matrix/?ref=localhost)
* [https://leetcode.com/problems/rotate-image/](https://leetcode.com/problems/rotate-image/?ref=localhost)
* [https://leetcode.com/problems/set-matrix-zeroes/](https://leetcode.com/problems/set-matrix-zeroes/?ref=localhost)
* [https://leetcode.com/problems/valid-sudoku](https://leetcode.com/problems/valid-sudoku?ref=localhost)

**Stack and Queues**

* [https://leetcode.com/problems/implement-queue-using-stacks](https://leetcode.com/problems/implement-queue-using-stacks?ref=localhost)
* [https://leetcode.com/problems/implement-stack-using-queues](https://leetcode.com/problems/implement-stack-using-queues?ref=localhost)
* [https://leetcode.com/problems/valid-parentheses](https://leetcode.com/problems/valid-parentheses?ref=localhost)
* [https://leetcode.com/problems/daily-temperatures/](https://leetcode.com/problems/daily-temperatures/?ref=localhost)
* [https://leetcode.com/problems/implement-queue-using-stacks](https://leetcode.com/problems/implement-queue-using-stacks?ref=localhost)
* [https://leetcode.com/problems/longest-valid-parentheses](https://leetcode.com/problems/longest-valid-parentheses?ref=localhost)
* [https://leetcode.com/problems/largest-rectangle-in-histogram](https://leetcode.com/problems/largest-rectangle-in-histogram?ref=localhost)
* [https://leetcode.com/problems/maximal-rectangle](https://leetcode.com/problems/maximal-rectangle?ref=localhost)
* [https://leetcode.com/problems/min-stack/](https://leetcode.com/problems/min-stack/?ref=localhost)
* [https://leetcode.com/problems/trapping-rain-water](https://leetcode.com/problems/trapping-rain-water?ref=localhost)
* [https://leetcode.com/problems/remove-k-digits](https://leetcode.com/problems/remove-k-digits?ref=localhost)
* [https://leetcode.com/problems/sliding-window-maximum/](https://leetcode.com/problems/sliding-window-maximum/?ref=localhost)

**String**

* [https://leetcode.com/problems/longest-palindromic-substring/](https://leetcode.com/problems/longest-palindromic-substring/?ref=localhost)
* [https://leetcode.com/problems/longest-substring-without-repeating-characters/](https://leetcode.com/problems/longest-substring-without-repeating-characters/?ref=localhost)
* [https://leetcode.com/problems/longest-common-prefix/](https://leetcode.com/problems/longest-common-prefix/?ref=localhost)
* [https://leetcode.com/problems/minimum-window-substring/](https://leetcode.com/problems/minimum-window-substring/?ref=localhost)
* [https://leetcode.com/problems/valid-anagram/](https://leetcode.com/problems/valid-anagram/?ref=localhost)
* [https://leetcode.com/problems/regular-expression-matching/](https://leetcode.com/problems/regular-expression-matching/?ref=localhost)
* [https://leetcode.com/problems/largest-number/](https://leetcode.com/problems/largest-number/?ref=localhost)

**Greedy**

* [https://leetcode.com/problems/minimum-number-of-arrows-to-burst-balloons](https://leetcode.com/problems/minimum-number-of-arrows-to-burst-balloons?ref=localhost)
* [https://leetcode.com/problems/best-time-to-buy-and-sell-stock-ii/](https://leetcode.com/problems/best-time-to-buy-and-sell-stock-ii/?ref=localhost)
* [https://leetcode.com/problems/jump-game-ii/](https://leetcode.com/problems/jump-game-ii/?ref=localhost)
* [https://leetcode.com/problems/candy/](https://leetcode.com/problems/candy/?ref=localhost)

**Recursion and Backtracking**

* [https://leetcode.com/problems/combination-sum/](https://leetcode.com/problems/combination-sum/?ref=localhost)
* [https://leetcode.com/problems/combination-sum-ii/](https://leetcode.com/problems/combination-sum-ii/?ref=localhost)
* [https://leetcode.com/problems/letter-combinations-of-a-phone-number/](https://leetcode.com/problems/letter-combinations-of-a-phone-number/?ref=localhost)
* [https://leetcode.com/problems/generate-parentheses/](https://leetcode.com/problems/generate-parentheses/?ref=localhost)
* [https://leetcode.com/problems/sudoku-solver](https://leetcode.com/problems/sudoku-solver?ref=localhost)
* [https://leetcode.com/problems/permutations/](https://leetcode.com/problems/permutations/?ref=localhost)
* [https://leetcode.com/problems/permutations-ii/](https://leetcode.com/problems/permutations-ii/?ref=localhost)
* [https://leetcode.com/problems/n-queens/](https://leetcode.com/problems/n-queens/?ref=localhost)
* [https://leetcode.com/problems/n-queens-ii/](https://leetcode.com/problems/n-queens-ii/?ref=localhost)
* [https://leetcode.com/problems/subsets](https://leetcode.com/problems/subsets?ref=localhost)
* [https://leetcode.com/problems/next-permutation](https://leetcode.com/problems/next-permutation?ref=localhost)
* [https://leetcode.com/problems/permutation-sequence/](https://leetcode.com/problems/permutation-sequence/?ref=localhost)
* [https://leetcode.com/problems/combinations/](https://leetcode.com/problems/combinations/?ref=localhost)

**Linked List**

* [https://leetcode.com/problems/reverse-linked-list](https://leetcode.com/problems/reverse-linked-list?ref=localhost) (Both Iterative / Recursive)
* [https://leetcode.com/problems/reverse-nodes-in-k-group](https://leetcode.com/problems/reverse-nodes-in-k-group?ref=localhost)
* [https://leetcode.com/problems/linked-list-cycle/](https://leetcode.com/problems/linked-list-cycle/?ref=localhost)
* [https://leetcode.com/problems/merge-two-sorted-lists](https://leetcode.com/problems/merge-two-sorted-lists?ref=localhost)
* [https://leetcode.com/problems/merge-k-sorted-lists](https://leetcode.com/problems/merge-k-sorted-lists?ref=localhost)
* [https://leetcode.com/problems/linked-list-cycle/](https://leetcode.com/problems/linked-list-cycle/?ref=localhost)
* [https://leetcode.com/problems/middle-of-the-linked-list](https://leetcode.com/problems/middle-of-the-linked-list?ref=localhost)
* [https://leetcode.com/problems/delete-the-middle-node-of-a-linked-list](https://leetcode.com/problems/delete-the-middle-node-of-a-linked-list?ref=localhost)
* [https://leetcode.com/problems/intersection-of-two-linked-lists/](https://leetcode.com/problems/intersection-of-two-linked-lists/?ref=localhost)
* [https://leetcode.com/problems/sort-list/](https://leetcode.com/problems/sort-list/?ref=localhost)
* [https://leetcode.com/problems/copy-list-with-random-pointer/](https://leetcode.com/problems/copy-list-with-random-pointer/?ref=localhost)
* [https://leetcode.com/problems/lru-cache](https://leetcode.com/problems/lru-cache?ref=localhost)

**Heap**

* [https://leetcode.com/problems/kth-largest-element-in-an-array](https://leetcode.com/problems/kth-largest-element-in-an-array?ref=localhost)
* [https://leetcode.com/problems/find-median-from-data-stream](https://leetcode.com/problems/find-median-from-data-stream?ref=localhost)
* [https://leetcode.com/problems/top-k-frequent-elements](https://leetcode.com/problems/top-k-frequent-elements?ref=localhost)
* [https://leetcode.com/problems/top-k-frequent-words](https://leetcode.com/problems/top-k-frequent-words?ref=localhost)
* [https://leetcode.com/problems/k-closest-points-to-origin/](https://leetcode.com/problems/k-closest-points-to-origin/?ref=localhost)

**Binary Trees**

* [https://leetcode.com/problems/binary-tree-inorder-traversal/](https://leetcode.com/problems/binary-tree-inorder-traversal/?ref=localhost)
* [https://leetcode.com/problems/binary-tree-level-order-traversal/](https://leetcode.com/problems/binary-tree-level-order-traversal/?ref=localhost)
* [https://leetcode.com/problems/diameter-of-binary-tree](https://leetcode.com/problems/diameter-of-binary-tree?ref=localhost)
* [https://leetcode.com/problems/maximum-depth-of-binary-tree](https://leetcode.com/problems/maximum-depth-of-binary-tree?ref=localhost)
* [https://leetcode.com/problems/invert-binary-tree/](https://leetcode.com/problems/invert-binary-tree/?ref=localhost)
* [https://leetcode.com/problems/same-tree/](https://leetcode.com/problems/same-tree/?ref=localhost)
* [https://leetcode.com/problems/binary-tree-right-side-view/](https://leetcode.com/problems/binary-tree-right-side-view/?ref=localhost)
* [https://leetcode.com/problems/construct-binary-tree-from-preorder-and-inorder-traversal/](https://leetcode.com/problems/construct-binary-tree-from-preorder-and-inorder-traversal/?ref=localhost)
* [https://leetcode.com/problems/flatten-binary-tree-to-linked-list/](https://leetcode.com/problems/flatten-binary-tree-to-linked-list/?ref=localhost)
* [https://leetcode.com/problems/path-sum-iii/](https://leetcode.com/problems/path-sum-iii/?ref=localhost)
* [https://leetcode.com/problems/lowest-common-ancestor-of-a-binary-tree/](https://leetcode.com/problems/lowest-common-ancestor-of-a-binary-tree/?ref=localhost)
* [https://leetcode.com/problems/all-nodes-distance-k-in-binary-tree/](https://leetcode.com/problems/all-nodes-distance-k-in-binary-tree/?ref=localhost)
* [https://leetcode.com/problems/serialize-and-deserialize-binary-tree](https://leetcode.com/problems/serialize-and-deserialize-binary-tree?ref=localhost)

**Binary Search Trees**

* [https://leetcode.com/problems/delete-node-in-a-bst/](https://leetcode.com/problems/delete-node-in-a-bst/?ref=localhost)
* [https://leetcode.com/problems/validate-binary-search-tree/](https://leetcode.com/problems/validate-binary-search-tree/?ref=localhost)
* [https://leetcode.com/problems/lowest-common-ancestor-of-a-binary-search-tree](https://leetcode.com/problems/lowest-common-ancestor-of-a-binary-search-tree?ref=localhost)
* [https://leetcode.com/problems/convert-sorted-array-to-binary-search-tree](https://leetcode.com/problems/convert-sorted-array-to-binary-search-tree?ref=localhost)
* [https://leetcode.com/problems/kth-smallest-element-in-a-bst/](https://leetcode.com/problems/kth-smallest-element-in-a-bst/?ref=localhost)

**Trie**

* [https://leetcode.com/problems/implement-trie-prefix-tree/](https://leetcode.com/problems/implement-trie-prefix-tree/?ref=localhost)
* [https://leetcode.com/problems/design-add-and-search-words-data-structure/](https://leetcode.com/problems/design-add-and-search-words-data-structure/?ref=localhost)

**Dynamic Programming**

* [https://leetcode.com/problems/coin-change/](https://leetcode.com/problems/coin-change/?ref=localhost)
* [https://leetcode.com/problems/target-sum/](https://leetcode.com/problems/target-sum/?ref=localhost)
* [https://leetcode.com/problems/climbing-stairs](https://leetcode.com/problems/climbing-stairs?ref=localhost)
* [https://leetcode.com/problems/maximum-subarray](https://leetcode.com/problems/maximum-subarray?ref=localhost)
* [https://leetcode.com/problems/edit-distance/](https://leetcode.com/problems/edit-distance/?ref=localhost)
* [https://leetcode.com/problems/partition-equal-subset-sum/](https://leetcode.com/problems/partition-equal-subset-sum/?ref=localhost)
* [https://leetcode.com/problems/word-break](https://leetcode.com/problems/word-break?ref=localhost)
* [https://leetcode.com/problems/word-break-ii/](https://leetcode.com/problems/word-break-ii/?ref=localhost)
* [https://leetcode.com/problems/combination-sum-iv](https://leetcode.com/problems/combination-sum-iv?ref=localhost)
* [https://leetcode.com/problems/maximum-profit-in-job-scheduling/](https://leetcode.com/problems/maximum-profit-in-job-scheduling/?ref=localhost)
* [https://leetcode.com/problems/minimum-cost-to-cut-a-stick/](https://leetcode.com/problems/minimum-cost-to-cut-a-stick/?ref=localhost)
* [https://leetcode.com/problems/house-robber/](https://leetcode.com/problems/house-robber/?ref=localhost)
* [https://leetcode.com/problems/longest-increasing-subsequence](https://leetcode.com/problems/longest-increasing-subsequence?ref=localhost)
* [https://leetcode.com/problems/partition-equal-subset-sum/](https://leetcode.com/problems/partition-equal-subset-sum/?ref=localhost)
* [https://leetcode.com/problems/decode-ways/](https://leetcode.com/problems/decode-ways/?ref=localhost)
* [https://leetcode.com/problems/maximal-square/](https://leetcode.com/problems/maximal-square/?ref=localhost)
* [https://leetcode.com/problems/jump-game](https://leetcode.com/problems/jump-game?ref=localhost)

**Graph**

* [https://leetcode.com/problems/flood-fill](https://leetcode.com/problems/flood-fill?ref=localhost)
* [https://leetcode.com/problems/clone-graph/](https://leetcode.com/problems/clone-graph/?ref=localhost)
* [https://leetcode.com/problems/number-of-islands/](https://leetcode.com/problems/number-of-islands/?ref=localhost)
* [https://leetcode.com/problems/rotting-oranges](https://leetcode.com/problems/rotting-oranges?ref=localhost)
* [https://leetcode.com/problems/word-search/](https://leetcode.com/problems/word-search/?ref=localhost)
* [https://leetcode.com/problems/course-schedule](https://leetcode.com/problems/course-schedule?ref=localhost)
* [https://leetcode.com/problems/course-schedule-ii](https://leetcode.com/problems/course-schedule-ii?ref=localhost)
* [https://leetcode.com/problems/possible-bipartition/](https://leetcode.com/problems/possible-bipartition/?ref=localhost)
* [https://leetcode.com/problems/cheapest-flights-within-k-stops/](https://leetcode.com/problems/cheapest-flights-within-k-stops/?ref=localhost)
* [https://leetcode.com/problems/bus-routes/](https://leetcode.com/problems/bus-routes/?ref=localhost)
* [https://leetcode.com/problems/word-search-ii/](https://leetcode.com/problems/word-search-ii/?ref=localhost)
* [https://leetcode.com/problems/water-and-jug-problem/](https://leetcode.com/problems/water-and-jug-problem/?ref=localhost)

**Bits**

* [https://leetcode.com/problems/single-number/](https://leetcode.com/problems/single-number/?ref=localhost)
* [https://leetcode.com/problems/single-number-ii/](https://leetcode.com/problems/single-number-ii/?ref=localhost)
* [https://leetcode.com/problems/number-of-1-bits/](https://leetcode.com/problems/number-of-1-bits/?ref=localhost)
* [https://leetcode.com/problems/bitwise-and-of-numbers-range/](https://leetcode.com/problems/bitwise-and-of-numbers-range/?ref=localhost)
* [https://leetcode.com/problems/counting-bits](https://leetcode.com/problems/counting-bits?ref=localhost)
* [https://leetcode.com/problems/hamming-distance/](https://leetcode.com/problems/hamming-distance/?ref=localhost)
* [https://leetcode.com/problems/power-of-two/](https://leetcode.com/problems/power-of-two/?ref=localhost)
* [https://leetcode.com/problems/reverse-bits/](https://leetcode.com/problems/reverse-bits/?ref=localhost)