[Easy]
1-Stock max profit. Buy and Sell once.(Minimum size battery needed by robot to complete a hil journey) / buy and sell any number of times
2- You have integer array of N values. Return minimum integer which can't be represented as the sum of any sub-set of this array.
3-Remove repetitions from a sorted array.
4- Find common elements in 2 sorted array.
5- Find if a pair exist with sum as K in a sorted Array.
6- Majority element of sorted array.
7- Dutch Flag Problem(even-odd)
8- French Flag Problem(3 class)
9- Find majority element in an array
10- Find 1st missing positive number in a array
11- Compute max product of all but one entry. Array can has positive, negative or 0. You can't use division.
12- Compute longest continuous in creasing sub array.
13- Compute array such that Arr[i] is product of all element except Arr[i] initially. You can't use division. Extra space as O(1)
14- Apply permutation to an array.
15- Generate next larger permutation of an array.
16- From an integer array of N distinct integers, return a random set of K integers. All k size sunsets should be equally likely. You have a rand(min, max) function / generate a random permutation

17- Check if two rectangle intersects. Rectangles are parallel to  $\boldsymbol{X}$  and  $\boldsymbol{Y}$  axis.

Array:

- 18- Merge two sorted A and B array. A is large enough to have extra empty space to include B.
- 19- Sort an array of string so that all anagrams will be together
- 20- Search in sorted array on unknown length
- 21- Two integer array given. Find pair having elements from different array with minimum diff.

## [Moderate]

151- Rearrange integer array elements as alternate peak and valley i.e. make an array like

$$A[0] \le A[1] \ge A[2] \le A[3] \ge A[4] \le A[5]$$
 etc

152- Sub-Array with Maximum sum( complexity N3 => N2 => N)

153- Find median of 2 sorted Array.

153A- Same size

153B- Different size

- 154- Find kth smallest element of an array.
- 155- Find if an array have majority element.
- 156- Minimum subarray having all elements or sum > K.

157- Stock max profit. Buy and Sell twice
158- In 2D array all ways to reach from [0][0] to [N-1][M-1] by moving either right or down only
159- Find celebrity
160- <zero matrix=""> Fill entire ith row and jth column with 0's, if arr[i][j] is 0</zero>
161- Rotate a N*N 2D integer array 90* clockwise
162- Search in 2D array sorted by both row and column wise
163- Shortest sub array in a longer array which contains all the elements of a smaller array .
[Tough]
251- Find Largest SubMatrix with maximum sum. in 2D integer array.
252- Find largest subMatrix with all 1's in a 2D array of 1 & 0 only.

253- Calculate number of subArrays with same number of 1 $\&$ 0, in a array having 1 $\&$ 0 only
<mark>254-</mark> Given an array arr[], find the maximum j – i such that arr[j] > arr[i]
String:
[Easy]
301- Check if a String is rotation of other.
302- Rotate a string by ith index.
303- Check is S1 is Substring of S2. If yes, return its staring index of 1st match.
304- Return Nth number of Look and Say sequence ( 1, 11, 21, 1211, 111221, 312211, 13112221, 1113213211 etc )

305- Implement run length encoding and decoding	
306- SnackString of sinusoidal representation of input string.	
307- Check if string has all unique characters.	
308- Replace all space in a string by '%20'. String has enough extra space.	
309- Check if one string is permutation of a palindrome.	
310- Compress string with continuous count if possible ( aabbbcdeeaaa => a2b3c1d1e2a3 )	)
*311- Convert spreadsheet(xI) column Id to corresponding no	
*312- All mnemonics of a number(print only valid words)	
313- Check if one string is permutation of other	
[Moderate]	
351- Reverse sequence of words in a string.	
352- Largest sub-string with matching parentheses	
353- Pattern matching. pattern has only two type of chars A & B. like pattern - aaba , string catcatgocat	-

[Easy]
401- Implement Queue by 2 stacks
402- Implement 3 stack using an Array
403- < Validate parentheses - Stack> Check whether the given expression has balanced symbols. such as (, {, or [
404- Prefix and postfix notions are methods of writing mathematical expressions without parenthesis. Generate and Evaluate a postfix and prefix expression [Stack]
405- Implement Stack using 2 queues
406- Find nearest lesser element in the left array for all the elements
407- Find largest spans of a stock(maximum consecutive days for which stock price was less or equal of current day price)
408- implement SetOfStacks when size of one stack is limited.
409-
[Moderate]

451- Implement Min Stack (having extra method getMin() in O(1) time)
452- Sort Stack using an additional stack
453- Implement a queue which also provide get_max() along with push_back() and pop_front() all in O(1) time.
[Tough]
<mark>481</mark> - Largest rectangle under histogram
482- Finding max for sliding window of K size
Linked List:
[Easy]
500- Counting nodes in circular linked list; Insert/Delete a node at the end/front of circular linked list

- 501- Merge 2 sorted linked list.
- 502- Reverse a linked list.
- 503- Find point of merger of two lists.
- 504- Remove duplicates in an unsorted list.
- 505- Return kth element from last; using recursion
- 506- Delete middle element of the list
- 507- Check if list is palindrome
- 508- Add two integer numbers represented by linked list
- 509- Add two polynomials represented by linked list(each element having two variables 1-coefficient, 2- power )
- 510- Check if 2 lists are merging. Find point of merger
- 511- Split a Circular Linked List into two equal parts.
- 512- <JosephusCircle>: N people have decided to elect a leader by arranging themselves in a circle and eliminating every Mth person around the circle, closing ranks as each person drops out. Find which person will be the last one remaining (starting with rank 1).
- 513- Given a list, rotate the list to the right by k places, where k is non-negative. For example: Given 1 ->2->3->4->5->NULL and k = 2, return 4->5->1->2->3->NULL.
- 514- A linked list has both even and odd numbers. Write an algorithm for making changes to the list in such a way that all even numbers appear at the beginning.
- 515- Flattening a doubly linked list with extra pointer of child list of same type. ; Unflatten new list to input list.
- 516- Remove middle element of linked list
- 517- Add to integer numbers represented as linked list.
- 518- Check if linked list is a palindrome

## [Moderate]

551- <Interleaving starting half and reverse second half> Given a singly linked list L0 -> L1 -> ... -> Ln-1 -> Ln.

Rearrange the nodes in the list so that the new formed list is : L0 -> Ln -> L1 -> Ln-1 -> L2 -> Ln-2 ... Ex (1-> 2-> 3-> 4-> 5-> ===> 1-> 5-> 2-> 4-> 3)

552- Reverse list pairwise(1-> 2-> 3-> 4-> 5-> ===> 2-> 1-> 4-> 3-> 5)

553- Sort a linked list

554- Swap linked list ith and jth elements from start and end by changing links

555- Partition a linked list by a number X.(X may have multiple entries in the list)

556- Detect position of loop in a linked list. Size of the loop.

557- Implement LRU cache

558- Merge K sorted list in a single sorted list[Heap]

559- Loop in a linked list; Size of the loop; Node where loop start

660- Reverse linked list in K size blocks

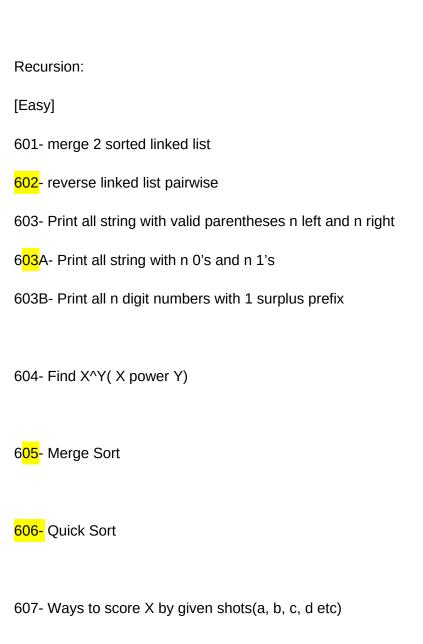
661- Input array of N integers is given. Compute all maximum value of sliding window of K size.

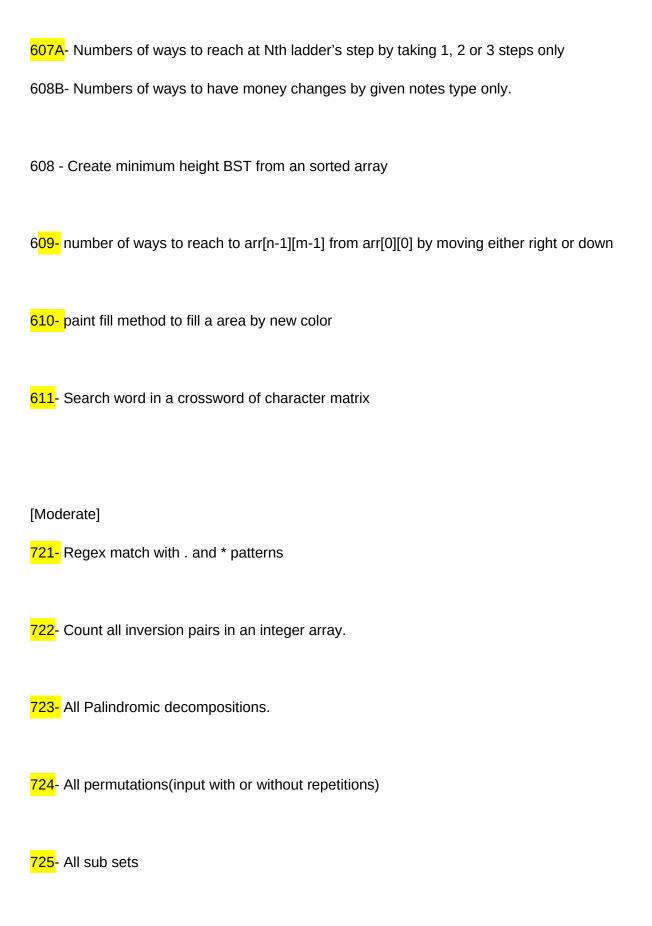
#### [Tough]

581- <DLL by XOR> Implement memory efficient double linked list using single linked list structure

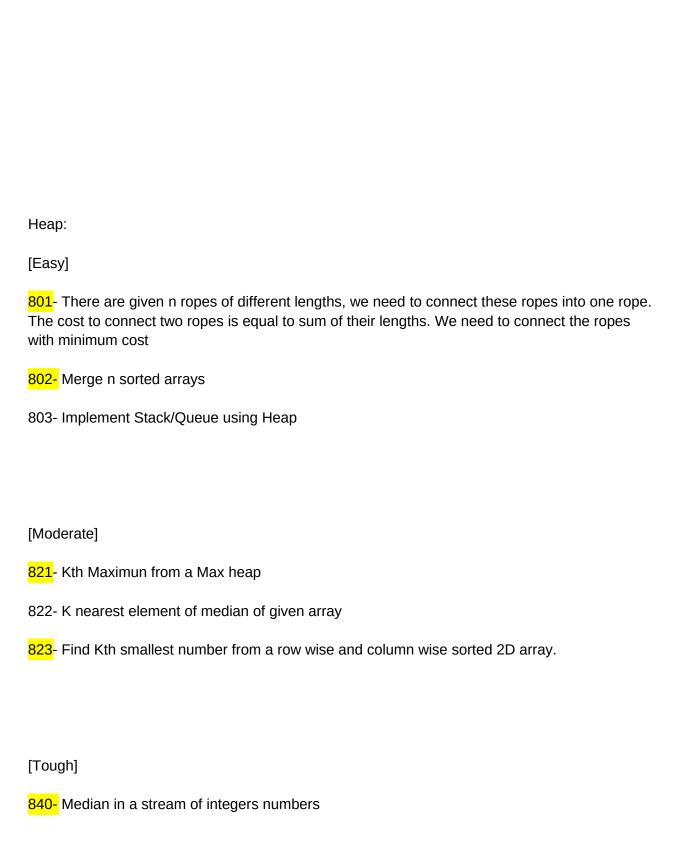
582- <Clone a list with random pointer>

583-





726- All subsets of K e	elements from N size array	
<mark>727-</mark> All positions of 8	not attacking queens in a 8*8 board	
<mark>728</mark> - Return all possib 123.6.28.45 become	le IP addresses when dots( . ) got missing from original address( like 12362845 )	
<mark>729</mark> - All valid permuta	tions of n left and right parentheses ( )	
<mark>730</mark> - All path of robot i	n a grid	
has one character. Fir	y, a method to do lookup in dictionary and a M x N board where every ad all possible words that can be formed by a sequence of adjacent we can move to any of 4 adjacent characters, but a word should not hat ame cell.	
732- Given an array o where the sum is equa	f positive integers arr[] and a sum x, find all unique combinations in arral to x.	·O
[Tough]		
<mark>771</mark> - Fill a Soduku gar	ne of 9*9 matrix	
772- Sorted Linked Lis	st to height balanced BST in O(n) time	



841- Compare Kth largest element of a max heap with a given numner
Sort/Search:
[Easy]
851- Min of rotated sorted array ; search in rotated sorted array
852- Index of turning number in UniModal array (unimodal array that increases than decreases like 1, 2, 3, 5, 7, 14, 11, 9, 8)
853- Find minimum sun array such that if you sort it entire array got sorted
[Moderate]
881- Find majority element in an array
882- Smallest k number of N size integer array
883- Magic index of a sorted array. Magic Index is one where Arr[i] == i
884- Minimum platforms needed to serve all trains schedule (minimum rooms for all meetings)
885- Minimum Visits to check all scheduled tasks in a factory
886- Maximum meetings you can attend in a day. All meetings start and end time is given

887- Merge Calendar meetings as disjoint busy and free time periods.
888- Sort a very big file like 20gb cant be loaded whole into RAM.
[Tough]
901 - Arrange given numbers to form the biggest number.
Hash:
[Easy]
951- remove repetitions in a linked list
[Moderate]
<mark>971</mark> - Implement LRU cache
972- 1st non-repeated number among a stream on integers
973- N points are given. Find line with highest points on it.

ГΤ.	วนดู	. 1_7
116	) I I (	ırıı
	Juc	4111

<b>-</b> ·	_	100	_
Bına	ırv I re	e/BS1	

# [Easy]

- 1000- Return count/sum of all nodes/leafs/single parent/full nodes of a BT
- 1001- Height of Binary Tree
- 1002- <check clone BT> Check if two BT are some in terms of both content and structure
- 1003- Numbers of elements between (Low, High) values in a BST
- 1004- Return in-order successor of a node in BT, if parent pointer is given in all nodes
- 1005- Return post-order successor of a node in BT, if parent pointer is given in all nodes
- 1006- <Level Order Traversal> Create linked lists for each depth from a Btree or Print elements level wise, Level with max sum
- 1007- Print/Count all elements at K distance from the root of BT
- 1008- Check if BT is balanced or not.
- 1009- Check if given BT is BST or not

- 1010- Node with highest depth
- 1011- Sum of the multiplication of elements at each level
- 1012- Check a BT for the mirror image of another BT
- 1013-<In Order Successor> parent node is given
- 1014- Check if a BT is symmetrical i.e. its mirror image is same
- 1015- Connect all the adjacent nodes at the same level in a binary tree using extra nextRight pointer.
- 1016- Level with maximum nodes; sum of nodes at each level s

#### [Moderate]

- 1101- Find diameter of a BT
- 1101- <First Common Ancestor> In a BT (easy in s BST)
- 1102- Implement getRandomNode() on a BT
- 1103- Preorder/Inorder traversal of BT without recursion. using explicit stack
- 1104- Create BT from inorder and preorder having unique elements
- 1105- Find max subtree which is full.
- 1106- Find max subtree which is Complete Binary Tree.
- 1107- Find max subtree of BT which is a BST.
- 1108- Find max path sum between any two nodes in a BT
- 1109- Serialize and de-serialize a BT
- 1110- Return random node of a BT. Random function is given
- 1111- Exterior of a binary tree. nodes in order => root to left most leaf -> leafs from left to right -> right most leaf to root

- 1112- Create BT from preorder and inorder traversal. All unique elements.; without recursion
- 1113- Construct Binary Tree from given Parent Array representation
- 1114- Left View
- 1115- Top View
- 1116- Bottom View
- 1117- Leafs from left to right; layer by layer
- 1118- BT to doubly linked list
- 1119- Doubly Linked List to BT
- 1120- Create balanced BST from sorted array
- 1121 All possible BT from N identical nodes
- 1122- Maximum path sum between any two nodes in BT
- 1123- Maximum size BST in a BT
- 1124- Maximum size full tree in a BT
- 1125- Maximum size complete BT in a BT

#### [Tough]

- 1251- Print/return lists of all sequences which will create the same BST
- 1252- Check is a BT T2 is subtree of T1.
- 1253-<Count paths with sum K> In a BT return numbers of downwards paths of sum as K. A path can start or end at any node
- 1254- Postorder traversal of BT without recursion

- 1255- Print BT by level in a Zigzag order
- 1256- Clone a BT with random pointer
- 1257- Left View Layer By Layer
- 1258- Right View Layer By Layer
- 1259- Bottom View Layer By Layer
- 1260- Merge two BST
- 1261- Create balanced BST from sorted linked list in O(N) time
- 1262- Two nodes of a BST are swapped, correct the BST
- 1263- Count of all Up to Down paths with sum equal to K.

	D١	<i>y</i> namic	Progra	mmina:
--	----	----------------	--------	--------

### [Easy]

- 1301 Number of ways to fill 2\*N strip with 2\*1 size bricks.
- 1302- Total ways to reach from left top to right bottom of a matrix by moving only right or down

#### [Moderate]

- 1351- <Matrix Chain Multiplication> Minimum cost of N Matrix multiplications (Printing brackets in Matrix Chain Multiplication Problem)
- 1352- Edit Distance between two strings
- 1353- Minimum number of coins for change
- 1354- Longest increasing subsequence
- (1354B- Longest increasing subsequence's length in NLogN time)
- 1355- <Russian doll problem> Stack of boxes
- 1356- Partition a set into two subsets such that the difference of subset sums is minimum

[Tough]
1341- Boolean evaluation: find no of ways to put parentheses to have true value for whole expression having AND, OR, and XOR operators
Greedy:
[Easy]
1501- Minimum platforms needed to serve all trains passing through a station. All trains arrival and departure time is given
1502- Build minimum road to connect all white buildings to black buildings in a line. There are n white and black buildings each. rode could be shared.
[Moderate]

[Tough]

# Graph:

1601- DFS/BFS

1602- Shortest Distance between two nodes (dijkstra algorithm)

1603- Minimum spanning tree

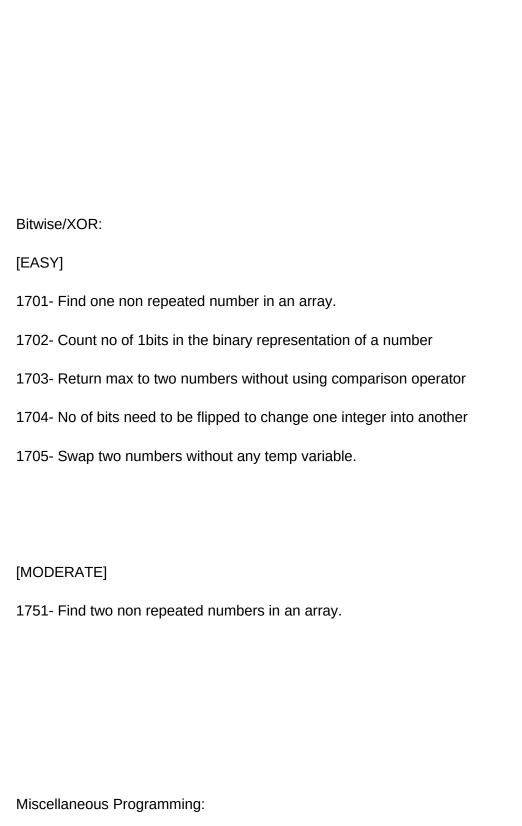
1604- Topological sort

# [Medium]

1651 - Given a sorted dictionary of an alien language, find order of characters.

Input: words[] = {"baa", "abcd", "abca", "cab", "cad"}

Output: Order of characters is 'b', 'd', 'a', 'c'



#### [Easy]

- 1801 Find intersection point if exist for two lines given as point1 and point2.
- 1802- Find if 4 points are making square
- 1803- Find if two rectangles overlap, we are given following four coordinates.
  - 11: Top Left coordinate of first rectangle. r1: Bottom Right coordinate of first rectangle.
- l2: Top Left coordinate of second rectangle. r2: Bottom Right coordinate of second rectangle.

Puzzles/Problems/Math/Probability/P&C/PS:

#### [Easy]

1- Number of trailing zeros in factorial N

#### [Moderate]

- 101- 100 doors. Flip every ith doors. Loop runs from 1 to 100. Initially all are closed. Tell which doors will be open in the end.
- 102- Bridge crossing only two can cross at a time, minimize total time 1, 2, 5, 10
- 103-8 bolls and balance. find heavy boll
- 104- Fox and duck problem

- 105- Count 45 minutes when you have threads which take 1 hour to burn completely
- 106- 1000 bottles. one has poison
- 107- Cover chessboard with dominos. Two diagonal corners are already covered at start.
- 108- blue eyes people to leave island
- 109-100 floor. 2 eggs. found min floor where egg will break
- 110- Find line which cut two squares in equal areas
- 111- 3 ants at the vertex of a triangle. they start moving randomly over edge with same speed. probability that no two ants collides.
- 112- Find 2nd best player among N players. You can have match between 2 players. Minimize total matches
- 113- 23 people are there in a room. Probability that at least two have birthday on same day. (No one has birthday on 29th fab)
- 114- 20 bottles. find bottle with heavy pills.
- 115- Boy to Girl ratio of a town where people keep having children till they have a girl child but no baby after a girl child.
- 116- 25 horses, only 5 can run in a race, minimum races you needed to find 3rd fastest horse

[Hard]

301- Josephus problem. N persons in a circle, every kth is eliminated repeatedly till only one left.

Puzzles -

Puzzles:

- 1-25 horses . Find 3rd fastest
- 2- 100 doors .. flip in series 1 to 100

- 3- bridge crossing 1, 2, 5, 10
- 4- find heavy boll, 25 bills
- 5- fox and duck
- 6- ant and tringle
- 7- 1000 bottles
- 8- black and white caps .. 100 prisoners
- 9- blue eye people
- 10- line to cut 2 squares into equal areas
- 12- boy and girl ratio in village
- 13-23 people in room. Probability that at least two have Bday on same date. No 29th fan bday