DSA Sheet

1. Basics – i/p-o/p , datatypes, if-else, switch, arrays, strings, for-while loop, functions, time complexity, patterns, c++ stl,

Basic maths – count digits, reverse no., palindrome, GCD, Armstrong no., print all divisors, check if prime

Basic recursion- sum of n nos., factorial, reverse an array, string – palindrome or not, Fibonacci no.

Hashing – counting freqs of array elements, highest/lowest freqs

1. Sorting - bubble sort(iterative, recursive), insertion sort(iterative, recursive) , selection sort, merge sort, quick sort
2. Arrays –
3. Easy : largest-second largest element, check if sorted, remove duplicates, left rotate by one place & by n spaces, find union, missing no., maxm. Consecutive ones, longest subarray with given sum
4. Medium : sort array of 0’s, 1’s, 2’s; majority element, kadane’s algo; subarray with maxm subarray sum; stock buy and sell, rotate matrix by 90 degs, matrix in spiral manner, count subarrays with given sum
5. Hard : Pascal’s triangle, 3-sum and 4-sum problem, merge overlapping subintervals, merge two sorted arrays w/o extra space; maximum product subarray; reverse pairs; count inversions; find repeating-missing no.
6. Binary search –
7. 1D array – BS to find x, lower-upper bound, search in rotated array, find minimum, no. of rotations array has undergone, find peak element
8. BS on answers – sq. root of no. in log n, nth root, smallest divisor, median of 2 sorted arrays,
9. 2D arrays – row with maxm. No. of 1’s, search in 2d matrix, matrix median, search row wise and column wise sorted matrix
10. Strings

(basic-easy) – remove outermost parenthesis, largest odd no. in the string, longest common prefix, isomorphic string, check if anagram, check whether rotated string

Medium – sort characters by freq., maxm. Nesting depth of parenthesis, roman to integer vice-versa, implement atoi, count number of substrings, longest palindromic substring, reverse words in string

1. Linked List –
2. Singly LL – insertion, deletion, search, find length
3. Doubly LL – insertion, deletion, reverse
4. Singly LL Medium – middle of LL (tortoiseHare method), reversal, detect loop, loop length, starting point of LL, check palindrome, segregate odd and even, remove nth node from back, delete middle node, sort, sort 0’s 1’s 2’s by changing links, intersection point of Y LL
5. DLL Medium – delete all occurrences of a key, find pairs with given sum, remove duplicates from sorted DLL
6. Hard – reverse LL in group of given size K, rotate LL, flattening LL, clone LL with random and next pointer
7. Recursion(Pattern-wise) :
8. Atoi(), Pow(x,n), Count good nos., Sort stack using recursion, Reverse stack using recursion
9. Subseq. Patterns – Generate all binary strings, generate parenthesis, print power set, count subseq. With sum K, combination sum, subset sum, letter combinations of phone number
10. Hard – Palindrome partitioning, N queen, word search, rat in a maze, word break, M colouring problem, sudoku solver, Expression add operators
11. Bit Manipulation
12. Theory, check if i-th bit is set or not, odd no. or not, no. is power of 2 or not, count no. of set bits, set/unset rightmost bit, swap 2 nos., divide two integers w/o multiplication, division or mod operator
13. Interview questions – count no. of bits to be flipped to convert A to B,