Check the review of this SDE sheet at Striver’s instagram story highlights.

Instagram id: Striver\_79

To know the entire list and other stuffs like Projects, Resume, how to give interviews….watch the entire video at:

<https://www.youtube.com/watch?v=WNtzUR_MwUQ>   
  
Find the placement series at: <https://www.youtube.com/watch?v=c0_1QnyVYQY&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=1>

Subscribe to the channel. :) (**take U forward**) (striver\_79)   
(Channel run by ex-Amazon | Media.net(Directi) | GFG) employee, CM at Codeforces and 6\* at Codechef)

*Only start doing these problems if you feel you are comfortable with solving basic problems of DSA. Once you are, you can start preparing for these problems, because these problems are solely interview based.*

**Day1: (Arrays)**

1. **Sort an array of 0’s 1’s 2’s without using extra space or sorting algo**

<https://www.youtube.com/watch?v=oaVa-9wmpns&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=2> (Problem link in description)

SOLUTION:

**void sort012(int a[], int n)**

**{**

**// We'll maintain threee pointers**

**int low = 0;**

**int mid = 0;**

**int high = n-1;**

**while(mid<=high)**

**{**

**if(a[mid] == 0)**

**{**

**swap(a[low], a[mid]);**

**low++;**

**mid++;**

**}**

**else if(a[mid] == 1)**

**{**

**mid++;**

**}**

**else if(a[mid] == 2)**

**{**

**swap(a[mid], a[high]);**

**high--;**

**}**

**}**

**}**

1. **Repeat and Missing Number**

<https://www.youtube.com/watch?v=5nMGY4VUoRY&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=3> (Problem link in description)

SOLUTION – 1

int \*findTwoElement(int \*arr, int n) {

int \*a = new int[2];

unordered\_map<int, bool> mp;

for(int i=0;i<n;i++)

{

//If we reach at the end of map without getting the arr[i], that means we need to update that element with freq 1

if(mp.find(arr[i])==mp.end())

{

mp.insert({arr[i], 1});

}

// Otherwise this is the number which is repeated

else

{

a[0] = arr[i];

}

}

for(int i=1;i<=n;i++)

{

//If we didn’t find I in the map

if(mp.find(i) == mp.end())

a[1] = i;

}

return a;

}

SOLUTION -2

int total = (n)\*(n+1)/2;

int sumOfArray = sum(a);

int sumOfSet = sum(set(a))

int repeating = sumOfArray – sumOfSet

int missing = total - sumOfSet

1. **Merge two sorted Arrays without extra space**

<https://www.youtube.com/watch?v=hVl2b3bLzBw&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=4> (Problem link in description)

void merge(long long a[], long long b[], int n, int m)

{

int x = n-1;

int y = 0;

while(x>=0 && y<m)

{

if(a[x] >b[y])

{

swap(a[x], b[y]);

x--;

y++;

}

else

{

x--;

}

}

sort(a,a+n);

sort(b,b+m);

}

1. **Kadane’s Algorithm**

<https://www.youtube.com/watch?v=w_KEocd__20&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=5>

SOLUTION:

int maxSubarraySum(int arr[], int n){

int sum = 0;

int maxi = INT\_MIN;

for(int i=0;i<n;i++)

{

sum+=arr[i];

maxi = max(sum, maxi);

if(sum<0)

{

sum = 0;

}

}

return maxi;

}

1. **Merge Overlapping Subintervals**

<https://www.youtube.com/watch?v=2JzRBPFYbKE&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=6>

SOLUTION:

vector<vector<int>> merge(vector<vector<int>>& intervals) {

vector<vector<int>> mergedIntervals;

if(intervals.size()==0) return mergedIntervals;

sort(intervals.begin(), intervals.end());

vector<int> tempInterval = intervals[0];

for(auto it: intervals)

{

if(it[0] <= tempInterval[1])

{

tempInterval[1] = max(it[1], tempInterval[1]);

}

else

{

mergedIntervals.push\_back(tempInterval);

tempInterval = it;

}

}

mergedIntervals.push\_back(tempInterval);

return mergedIntervals;

}

TEST CASE:-

Your input

[[1,3],[2,6],[8,10],[15,18]]

Output

[[1,6],[8,10],[15,18]]

1. **Find the duplicate in an array of N+1 integers.**(Ignore the video quality, as this was the first video which i recorded)  
   <https://www.youtube.com/watch?v=32Ll35mhWg0&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=1>

int findDuplicate(vector<int>& n) {

unordered\_map < int, int> mp;

for(int i =0;i<n.size();i++)

{

mp[n[i]]++;

}

int ans;

for(auto it = mp.begin(); it!=mp.end();it++)

{

if(it->second>=2)

{

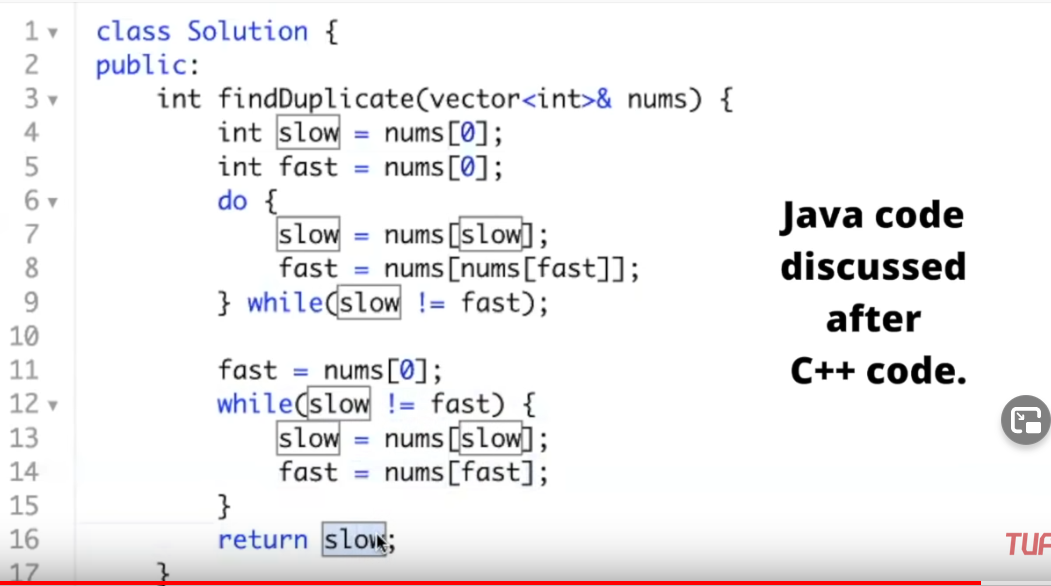
ans = it->first;

}

}

return ans;

}



Day2: (Arrays)

1. **Set Matrix Zeros**

(<https://www.youtube.com/watch?v=M65xBewcqcI&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=7>)

SOLUTION 1 :

**void setZeroes(vector<vector<int>>& m) {**

**int rows = m.size(), cols = m[0].size();**

**vector<pair<int, int>> zeros;**

**for(int i=0;i<rows;i++)**

**{**

**for(int j = 0;j<cols;j++)**

**{**

**if(m[i][j] == 0)**

**{**

**zeros.push\_back({i,j});**

**}**

**}**

**}**

**if(zeros.size() == rows\*cols) return;**

**for(auto it : zeros)**

**{**

**for(int i=0;i<rows;i++)**

**{**

**m[i][it.second] = 0;**

**}**

**for(int i=0;i<cols; i++)**

**{**

**m[it.first][i] = 0;**

**}**

**}**

**}**

1. **Pascal Triangle**

<https://www.youtube.com/watch?v=6FLvhQjZqvM&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=8>

vector<vector<int>> generate(int n) {

vector<vector<int>> ans;

for(int line = 1;line<=n;line++)

{

vector<int> temp;

fill(temp.begin(), temp.end(), 0);

int c = 1;

for(int i=1;i<=line;i++)

{

temp.push\_back(c);

c = c \* (line - i) / i;

}

ans.push\_back(temp);

}

return ans;

}

1. **Next Permutation**

<https://www.youtube.com/watch?v=LuLCLgMElus&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=9>

**void nextPermutation(vector<int>& nums) {**

**next\_permutation(nums.begin(), nums.end());**

**}**

1. **Inversion of Array** (Using Merge Sort)

<https://www.youtube.com/watch?v=kQ1mJlwW-c0&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=10>

1. **Stock Buy and Sell**

<https://www.youtube.com/watch?v=eMSfBgbiEjk&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=11>

int maxProfit(vector<int>& v) {

int temp = INT\_MAX, prof = 0;

for(int i=0;i<v.size()-1;i++)

{

temp = min(temp, v[i]);

prof = max(prof, v[i+1] - temp);

}

return prof;

}

1. **Rotate Matrix**

<https://www.youtube.com/watch?v=Y72QeX0Efxw&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=12>

void rotate(vector<vector<int>>& matrix) {

int N = matrix.size();

//Transpose

for(int i=0;i<N; i++)

{

for(int j=i+1; j<N; j++)

{

swap(matrix[i][j], matrix[j][i]);

}

}

// for(int i=0;i<N;i++)

// {

// for(int j=0;j<N; j++)

// {

// cout<<matrix[i][j]<<" ";

// }

// cout<<endl;

// }

//Reversing every row

for(int i=0;i<N;i++)

{

reverse(matrix[i].begin(), matrix[i].end());

}

}

**Day3: (Arrays/maths)**

1. **Search in a 2D matrix**

<https://www.youtube.com/watch?v=ZYpYur0znng&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=13>

bool searchMatrix(vector<vector<int>>& matrix, int target) {

int n = matrix.size();

int m = matrix[0].size();

int i=0, j = m-1;

while(i<n && j>=0){

if(matrix[i][j] == target){

return true;

}

else if(matrix[i][j]>target){

j--;

}

else{

i++;

}

}

return false;

}

As we can see that in leetcode problem that last element of previous row is less than first element of current row.

So if we put all the elements of matrix on a line, we can apply binary search on linear array.

bool searchMatrix(vector<vector<int>>& mat, int x) {

int n = mat.size();

int m = mat[0].size();

int low = 0, high = (n\*m) - 1;

while(low<=high){

int mid = (low + high)/2;

int i = mid / m;

int j = mid % m;

if(mat[i][j] == x) return true;

else if(mat[i][j] > x){

high = mid - 1;

}

else{

low = mid + 1;

}

}

return false;

}

1. **Pow(X,n)**

<https://www.youtube.com/watch?v=l0YC3876qxg&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=14>

double myPow(double x, int n) {

double ans = 1.0;

long nn = n;

if(nn<0) nn = (-1)\* nn;

while(nn>0){

if(nn%2!=0){

ans = ans\* x;

nn--;

}

else{

x = x \* x;

nn = nn/2;

}

}

if(n<0) ans = (double)(1.0) / (double)(ans);

return ans;

}

1. **Majority Element (>N/2 times)**  <https://www.youtube.com/watch?v=AoX3BPWNnoE&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=15>

**My Code:**

int majorityElement(vector<int>& a) {

map<int, int> mp;

for(int i=0;i<a.size();i++){

if(mp.find(a[i]) == mp.end()){

mp.insert({a[i], 1});

}

else{

mp[a[i]]++;

}

}

int myAns;

int ans = INT\_MIN;

for(auto it : mp){

if(it.second > ans){

myAns = it.first;

ans = it.second;

}

}

return myAns;

}

**Another Algorithm:**

1. **Majority Element (>N/3 times)**

<https://www.youtube.com/watch?v=yDbkQd9t2ig&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=16>

1. **Grid Unique Paths**

<https://www.youtube.com/watch?v=t_f0nwwdg5o&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=17>

1. **Reverse Pairs (Leetcode)**

<https://www.youtube.com/watch?v=S6rsAlj_iB4&list=PLgUwDviBIf0rPG3Ictpu74YWBQ1CaBkm2&index=18>

1. **Go through Puzzles from GFG** (Search on own)

**Day4: (Hashing)**

1. **2 Sum problem**

<https://www.youtube.com/watch?v=dRUpbt8vHpo&list=PLgUwDviBIf0rVwua0kKYlsS_ik_1lyVK_&index=1>

1. **4 Sum problem**

<https://www.youtube.com/watch?v=4ggF3tXIAp0&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=20>

1. **Longest Consecutive Sequence**   
   <https://www.youtube.com/watch?v=qgizvmgeyUM&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=21>
2. **Largest Subarray with 0 sum**

<https://www.youtube.com/watch?v=xmguZ6GbatA&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=22>

1. **Count number of subarrays with given XOR**(this clears a lot of problems)

<https://www.youtube.com/watch?v=lO9R5CaGRPY&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=23>

1. **Longest substring without repeat**

<https://www.youtube.com/watch?v=qtVh-XEpsJo&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=25>

**Day5: (LinkedList)**

1. **Reverse a LinkedList**

<https://www.youtube.com/watch?v=iRtLEoL-r-g&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=26>

1. **Find middle of LinkedList**<https://www.youtube.com/watch?v=sGdwSH8RK-o&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=27>
2. **Merge two sorted Linked List**

<https://www.youtube.com/watch?v=Xb4slcp1U38&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=28>

1. **Remove N-th node from back of LinkedList**

<https://www.youtube.com/watch?v=Lhu3MsXZy-Q&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=29>

1. **Delete a given Node when a node is given. (0(1) solution)**

<https://www.youtube.com/watch?v=icnp4FJdZ_c&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=30>

1. **Add two numbers as LinkedList**<https://www.youtube.com/watch?v=LBVsXSMOIk4&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=31>

**Day6:**

1. **Find intersection point of Y LinkedList**

<https://www.youtube.com/watch?v=u4FWXfgS8jw&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=32>

1. **Detect a cycle in Linked List**

<https://www.youtube.com/watch?v=354J83hX7RI&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=33>

1. **Reverse a LinkedList in groups of size k**.

<https://www.youtube.com/watch?v=Of0HPkk3JgI&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=33>

1. **Check if a LinkedList is palindrome or not.**

<https://www.youtube.com/watch?v=-DtNInqFUXs&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=35>

1. **Find the starting point of the Loop of LinkedList**<https://www.youtube.com/watch?v=QfbOhn0WZ88&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=36>
2. **Flattening of a LinkedList**<https://www.youtube.com/watch?v=ysytSSXpAI0&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=37>
3. **Rotate a LinkedList**

<https://www.youtube.com/watch?v=9VPm6nEbVPA&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=38>

**Day7: (2-pointer)**

1. **Clone a Linked List with random and next pointer**<https://www.youtube.com/watch?v=VNf6VynfpdM&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=39>
2. **3 sum**

<https://www.youtube.com/watch?v=onLoX6Nhvmg&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=40>

1. **Trapping rainwater**

<https://www.youtube.com/watch?v=m18Hntz4go8&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=41>

1. **Remove Duplicate from Sorted array**

<https://www.youtube.com/watch?v=Fm_p9lJ4Z_8&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=42>

1. **Max consecutive ones**

<https://www.youtube.com/watch?v=Mo33MjjMlyA&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=43>

**Day8: (Greedy)**

1. **N meeting in one room**

<https://www.youtube.com/watch?v=II6ziNnub1Q&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=44>

1. **Minimum number of platforms required for a railway**<https://www.youtube.com/watch?v=dxVcMDI7vyI&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=45>
2. **Job sequencing Problem**<https://www.youtube.com/watch?v=LjPx4wQaRIs&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=46>
3. **Fractional Knapsack Problem**  
   <https://www.youtube.com/watch?v=F_DDzYnxO14&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=48>
4. **Greedy algorithm to find minimum number of coins**<https://www.youtube.com/watch?v=mVg9CfJvayM&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=47>
5. **Activity Selection (it is same as N meeting in one room)**<https://www.youtube.com/watch?v=II6ziNnub1Q&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=44>

**Day9 (Recursion):**

1. **Subset Sums**<https://www.youtube.com/watch?v=rYkfBRtMJr8&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=52>
2. **Subset-II**<https://www.youtube.com/watch?v=RIn3gOkbhQE&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=53>
3. **Combination sum-1**   
   <https://www.youtube.com/watch?v=OyZFFqQtu98&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=49>
4. **Combination sum-2**   
   <https://www.youtube.com/watch?v=G1fRTGRxXU8&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=50>
5. **Palindrome Partitioning**   
   <https://www.youtube.com/watch?v=WBgsABoClE0&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=51>
6. **K-th permutation Sequence**

<https://www.youtube.com/watch?v=wT7gcXLYoao&list=PLgUwDviBIf0p4ozDR_kJJkONnb1wdx2Ma&index=55>

**Day10: (Recursion and Backtracking)**

1. **Print all Permutations of a string/array**
2. N queens Problem
3. Sudoku
4. M coloring Problem (Graph prob)
5. Rat in a Maze
6. Word Break (print all ways)

Day11: (Divide and Conquer)

1. 1/N-th root of an integer (use binary search) (square root, cube root, ..)
2. Matrix Median
3. Find the element that appears once in sorted array, and rest element appears twice (Binary search)
4. Search element in a sorted and rotated array/ find pivot where it is rotated
5. Median of 2 sorted arrays
6. K-th element of two sorted arrays

Day12: (Bits) (Optional, very rare topic in interviews, but if you have time left, someone might ask)

1. Check if a number if a power of 2 or not in O(1)
2. Count total set bits
3. Divide Integers without / operator
4. Power Set (this is very important)
5. Find MSB in o(1)
6. Find square of a number without using multiplication or division operators.

Day13: (Stack and Queue)

1. Implement Stack / Implement Queue
2. BFS
3. Implement Stack using Queue
4. Implement Queue using Stack
5. Check for balanced parentheses
6. Next Greater Element

Day14:

1. Next Smaller Element
2. LRU cache (vvvv. imp)
3. Largest rectangle in histogram
4. Sliding Window maximum
5. Implement Min Stack
6. Rotten Orange (Using BFS)

Day15: (String)

1. Reverse Words in a String
2. Longest Palindrome in a string
3. Roman Number to Integer and vice versa
4. Implement ATOI/STRSTR
5. Longest Common Prefix
6. Rabin Karp

Day16: (String)

1. Prefix Function/Z-Function
2. KMP algo
3. Minimum characters needed to be inserted in the beginning to make it palindromic.
4. Check for Anagrams
5. Count and Say
6. Compare version numbers

Day17: (Binary Tree)

1. Inorder Traversal (with recursion and without recursion)
2. Preorder Traversal (with recursion and without recursion)
3. Postorder Traversal (with recursion and without recursion)
4. LeftView Of Binary Tree
5. Bottom View of Binary Tree
6. Top View of Binary Tree

Day18: (Binary Tree)

1. Level order Traversal / Level order traversal in spiral form
2. Height of a Binary Tree
3. Diameter of Binary Tree
4. Check if Binary tree is height balanced or not
5. LCA in Binary Tree
6. Check if two trees are identical or not

Day 19: (Binary Tree)

1. Maximum path sum
2. Construct Binary Tree from inorder and preorder
3. Construct Binary Tree from Inorder and Postorder
4. Symmetric Binary Tree
5. Flatten Binary Tree to LinkedList
6. Check if Binary Tree is mirror of itself or not

Day 20: (Binary Search Tree)

1. Populate Next Right pointers of Tree
2. Search given Key in BST
3. Construct BST from given keys.
4. Check is a BT is BST or not
5. Find LCA of two nodes in BST
6. Find the inorder predecessor/successor of a given Key in BST.

Day21: (BinarySearchTree)

1. Floor and Ceil in a BST
2. Find K-th smallest and K-th largest element in BST (2 different Questions)
3. Find a pair with a given sum in BST
4. BST iterator
5. Size of the largest BST in a Binary Tree
6. Serialize and deserialize Binary Tree

Day22: (Mixed Questions)

1. Binary Tree to Double Linked List
2. Find median in a stream of running integers.
3. K-th largest element in a stream.
4. Distinct numbers in Window.
5. K-th largest element in an unsorted array.
6. Flood-fill Algorithm

Day23: (Graph)

1. Clone a graph (Not that easy as it looks)
2. DFS
3. BFS
4. Detect A cycle in Undirected Graph/Directed Graph
5. Topo Sort
6. Number of islands (Do in Grid and Graph both)
7. Bipartite Check

Day24: (Graph)

1. SCC(using KosaRaju’s algo)
2. Djisktra’s Algorithm
3. Bellman Ford Algo
4. Floyd Warshall Algorithm
5. MST using Prim’s Algo
6. MST using Kruskal’s Algo

Day25: (Dynamic Programming)

1. Max Product Subarray
2. Longest Increasing Subsequence
3. Longest Common Subsequence
4. 0-1 Knapsack
5. Edit Distance
6. Maximum sum increasing subsequence
7. Matrix Chain Multiplication

Day26: (DP)

1. Maximum sum path in matrix, (count paths, and similar type do, also backtrack to find the maximum path)
2. Coin change
3. Subset Sum
4. Rod Cutting
5. Egg Dropping
6. Word Break
7. Palindrome Partitioning (MCM Variation)
8. Maximum profit in Job scheduling

Day27:

1. Revise OS notes that you would have made during your sem
2. If not made notes, spend 2 or 3 days and make notes from Knowledge Gate.

Day28:

1. Revise DBMS notes that you would have made during your semesters.
2. If not made notes, spend 2 or 3 days and make notes from Knowledge Gate.

Day29:

1. Revise CN notes, that you would have made during your sem.
2. If not made notes, spend 2 or 3 days and make notes from Knowledge Gate.

Day30:

1. Make a note of how will your represent your projects, and prepare all questions related to tech which you have used in your projects. Prepare a note which you can say for 3-10 minutes when he asks you that say something about the project.

Hurrah!! You are ready for your placement after a month of hard-work without a cheat day.