

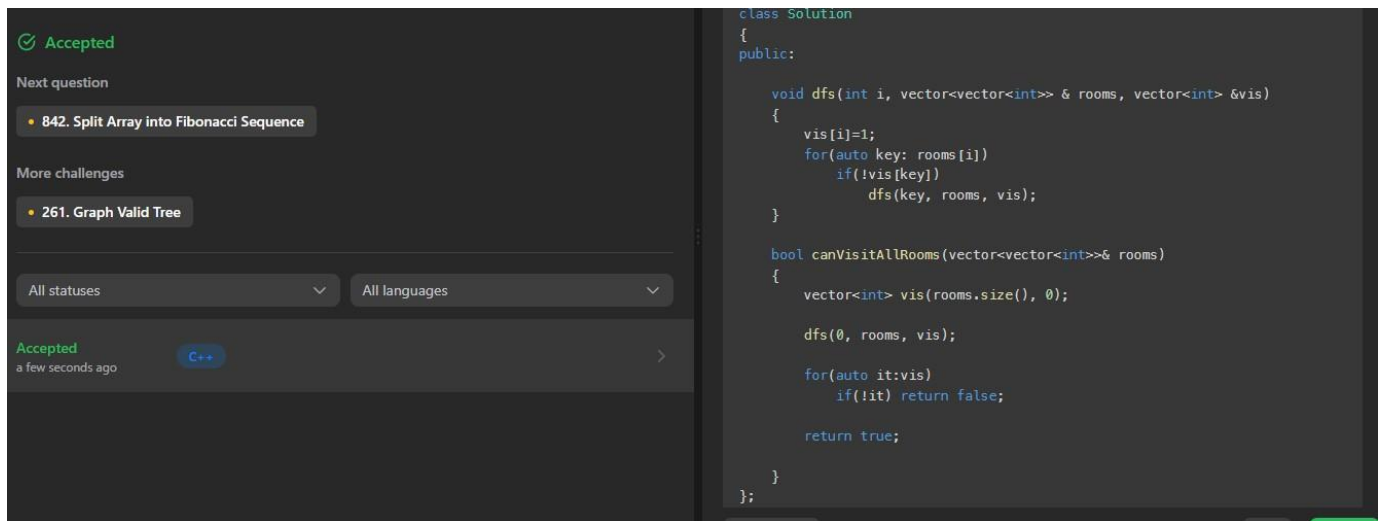
WORKSHEET 8

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Subject Name: IT Skills (DSA)

Question 1. KEYS AND ROOMS (DIVIDE AND CONQUER)



The screenshot shows a coding interface with a dark theme. On the left, there's a sidebar with a green checkmark and the word 'Accepted'. Below it, it says 'Next question' and lists two challenges: '842. Split Array into Fibonacci Sequence' and '261. Graph Valid Tree'. There are also filters for 'All statuses' and 'All languages'. On the right, the code editor shows a C++ solution for the 'Keys and Rooms' problem. The code defines a class 'Solution' with a public method 'dfs' and a 'canVisitAllRooms' function. The 'dfs' function marks a room as visited and recursively visits all rooms it can reach. The 'canVisitAllRooms' function initializes a visited array and calls 'dfs' from room 0. If all rooms are visited, it returns true; otherwise, it returns false.

```
class Solution
{
public:

    void dfs(int i, vector<vector<int>> & rooms, vector<int> &vis)
    {
        vis[i]=1;
        for(auto key: rooms[i])
            if(!vis[key])
                dfs(key, rooms, vis);
    }

    bool canVisitAllRooms(vector<vector<int>>& rooms)
    {
        vector<int> vis(rooms.size(), 0);

        dfs(0, rooms, vis);

        for(auto it:vis)
            if(!it) return false;

        return true;
    }
};
```

Question 2. DIVIDE ARRAY IN SETS OF K CONSECUTIVE NUMBERS (DIVIDE AND CONQUER)

Accepted

Next question

- 1297. Maximum Number of Occurrences of a Substring

More challenges

- 659. Split Array into Consecutive Subsequences
- 2155. All Divisions With the Highest Score of a Binary Array

All statuses

All languages

Accepted
a few seconds ago

C++

```

class Solution {
public:
    bool isPossibleDivide(vector<int>& nums, int k) {

        int n = nums.size();

        // if n is not multiple of k, then we can't divide the array
        if(n % k)
            return false;

        // sort the array
        sort(nums.begin(), nums.end());

        // store the frequency of every elements into the count map
        unordered_map<int, int> count;

        for(int i = 0; i < n; i++)
        {
            count[nums[i]]++;
        }

        // iterate over the array
        for(int i = 0; i < n; i++)
        {
            // if all the occurrence of curr element is include

            if(count[nums[i]] == 0)
                continue;

            // decrement the count of occurrence of curr element
            count[nums[i]]--;

            // check can we make a set of k consecutive numbers
            for(int j = 1; j < k; j++)
            {
                // if nums[i] + j is not present in count map, then we can't make a set of k cons

                if(count[nums[i] + j] == 0)
                    return false;

                // decrement the count of occurrence of nums[i] + j element
                count[nums[i] + j]--;
            }
        }

        return true;
    }
};

```

Question 3. FILTER RESTAURANTS BY VEGAN-FRIENDLY, PRICE AND DISTANCE (DIVIDE AND CONQUER)

Question .

4 LONGEST PALINDROME BY CONCATENATING TWO LETTER WORDS (DIVIDE AND CONQUER)

Accepted

Next question

1334. Find the City With the Smallest Number of Neighbors at a Threshold Distance

More challenges

1584. Min Cost to Connect All Points 1289. Minimum Falling Path Sum II

2025. Maximum Number of Ways to Partition an Array

All statuses All languages

Accepted
a few seconds ago C++

Related tags

Select tags 0/5

```
class Solution {
public:
    vector<int> filterRestaurants(vector<vector<int>>& restaurants, int v, :
        bool flag = false;
        if(v==0) flag = true;
        vector<vector<int>> ans;
        for(auto i:restaurants)
            if((i[2]==v || flag) && i[3]<=m && i[4]<=d) ans.push_back(i);
        sort(ans.begin(),ans.end(),[&](vector<int> &vec1,vector<int> &vec2)-
            return vec1[1]>vec2[1] || (vec1[1]==vec2[1] && vec1[0]>vec2[0]);
        });
        vector<int> a;
        for(auto i:ans) a.push_back(i[0]);
        return a;
    }
};
```

Accepted

Next question

2119. A Number After a Double Reversal

More challenges

336. Palindrome Pairs 409. Longest Palindrome

All statuses All languages

Accepted a few seconds ago C++

```

class Solution {
public:
    int longestPalindrome(vector<string>& words) {

        //initialize a map to store the occurrences of all words
        unordered_map<string, int> mp;

        //storing occurrences of all words
        for(auto i:words) mp[i]++;

        //this variable will be used later
        bool flag = false;
        int ans = 0;

        //iterating our map
        for(auto i:mp){

            string temp = i.first;
            reverse(temp.begin(), temp.end());

            //checking if it is palindrome word itself and the count of it :
            //this word can be inserted in the middle of our palindrome as :
            //but this can be done only once

```

```

        if(temp == i.first and i.second%2!=0 and flag == false){
            //we mark our flag to true because we want to insert this element onl
            flag = true;
            ans+=2;
            mp[temp]--;
        }

        //checking if the word as well its reverse exist in the map
        if(mp.find(i.first)!=mp.end() and mp.find(temp)!=mp.end()){

            //for the case when the word is not palindrome we will increase our a
            if(i.first!=temp){
                ans += min(mp[i.first], mp[temp])*2*2;
                mp[i.first]=mp[temp]=0;
            }
            //for the case when it is palindrome we just divide the count of the
            else{
                ans+=mp[temp]/2 *2*2;
                mp[i.first]=mp[temp]=0;
            }
        }
    }
    return ans;
}
};

```

Question 5. BOOKING CONCERT TICKETS IN GROUPS (DIVIDE AND CONQUER)

Accepted

Next question

2235. Add Two Integers

More challenges

1386. Cinema Seat Allocation 2407. Longest Increasing Subsequence II

All statuses All languages

Accepted a few seconds ago C++

```

class BookMyShow {
    int occ = -1; // No row occupied initially
    vector<long long> sumTree, maxTree;
    int treeSize = 0, rowSeats = 0;

public:
    BookMyShow(int n, int m) {
        // Seg tree size
        this->treeSize = (int) 2 * pow(2, ceil((double)log2(n)));
        sumTree.resize(treeSize);
        maxTree.resize(treeSize);

        this->rowSeats = m;
        constructSumTree(m);
        constructMaxTree(m);
    }

    void constructSumTree(int m){
        int n = this->treeSize/ 2;

        // Filling the leaves
        for(int i=n; i<2*n;i++){
            this->sumTree[i] = (long long) m;

```

Question .

```
// forming the higher nodes
for(int i=n-1;i>=1;i--)
    this->sumTree[i] = this->sumTree[2*i] + this->sumTree[2*i+1];
}

void constructMaxTree(int m){
    int n = this->treeSize/ 2;

    // Filling the leaves
    for(int i=n; i<2*n;i++)
        this->maxTree[i] = (long long) m;

    // Forming the higher nodes
    for(int i=n-1;i>=1;i--)
        this->maxTree[i] = max(this->maxTree[2*i], this->maxTree[2*i+1]);
}

long long rangeSum(int minRow, int maxRow){
    long long sum = 0;
    int n = treeSize / 2;
    minRow += n; maxRow += n;
    while(minRow <= maxRow){
        if(minRow % 2 == 1) sum += this->sumTree[minRow++]; // Right child
        if(maxRow % 2 == 0) sum += this->sumTree[maxRow--]; // Left child
        minRow /= 2; maxRow /= 2;
    }
}
```

```
return sum;
}

void updateSumTree(int index, int newValue){
    int n = this->treeSize / 2;
    int temp = index;
    index += n;
    this->sumTree[index] = newValue; // Update leaf
    index /= 2;
    while(index > 0){
        this->sumTree[index] = this->sumTree[2*index] + this->sumTree[2*index+1];
        index /= 2;
    }
}

long long rangeMax(int minRow, int maxRow){
    long long ans = 0;
    int n = this->treeSize / 2;
    minRow += n; maxRow += n;
    while(minRow <= maxRow){
        if(minRow % 2 == 1) ans = max(ans, this->maxTree[minRow++]); // Right child
        if(maxRow % 2 == 0) ans = max(ans, this->maxTree[maxRow--]); // Left child
        minRow /= 2; maxRow /= 2;
    }
}
```

```
return ans;
}

void updateMaxTree(int index, int newValue){
    int n = this->treeSize / 2;
    int temp = index;
    index += n;
    this->maxTree[index] = newValue; // Update leaf
    index /= 2;
    while(index > 0){
        this->maxTree[index] = max(this->maxTree[2*index], this->maxTree[2*index+1]);
        index /= 2;
    }
}

vector<int> gather(int k, int maxRow) {
    int minRow = occ + 1;
    if(maxRow < minRow) return {};
    if(rangeMax(minRow, maxRow) < k) return {};

    int minIndex = maxRow;
    int seats = 0;
    int low = minRow, high = maxRow;
    while(low <= high){
        int midRow = (low + high)/2;
        int maxSeats = rangeMax(minRow, midRow);
        if(maxSeats >= k){
            high = midRow - 1;
            seats = maxSeats;
            minIndex = midRow;
        }
        else low = midRow + 1;
    }
}
```

```
int r = minIndex, c = this->rowSeats - seats;

// Updating the segment trees
this->updateMaxTree(minIndex, seats - k);
this->updateSumTree(minIndex, seats - k);
return {r,c};
}

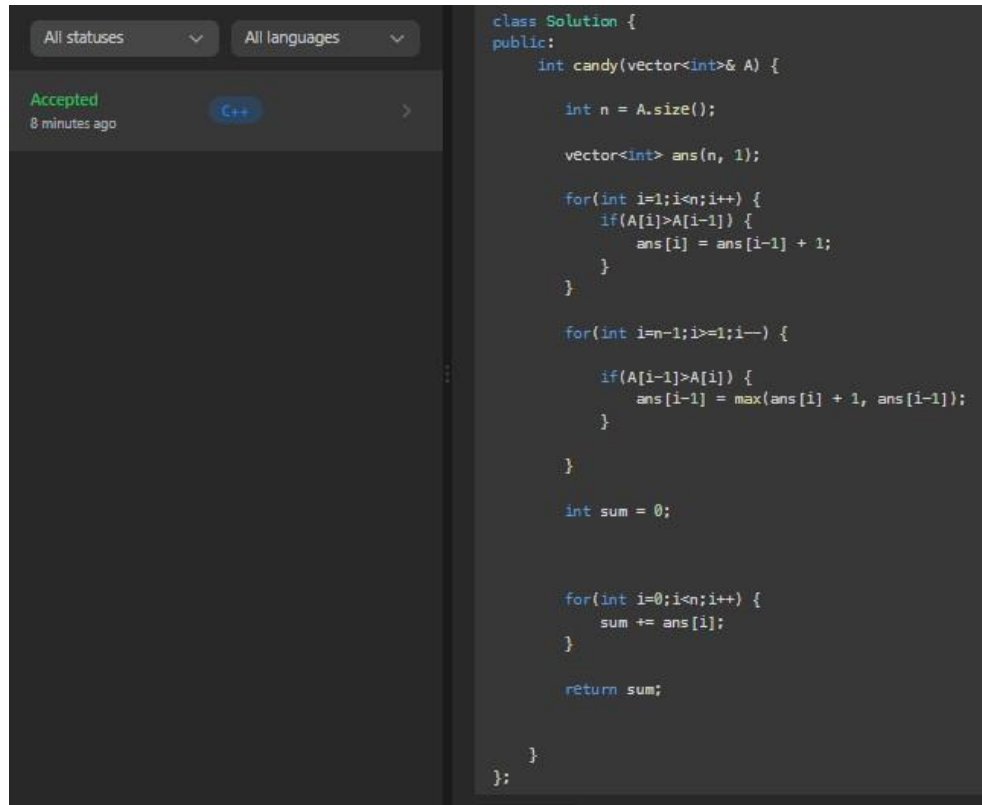
bool scatter(int k, int maxRow) {
    int minRow = occ + 1;
    if(maxRow < minRow) return false;
    if(rangeSum(minRow, maxRow) < k) return false;

    int minIndex = maxRow;
    long long seats = 0;
    int low = minRow, high = maxRow;
    while(low <= high){
        int midRow = (low + high)/2;
        long long rangeSeats = rangeSum(minRow, midRow);
        if(rangeSeats >= k){
            high = midRow - 1;
            seats = rangeSeats;
            minIndex = midRow;
        }
        else low = midRow + 1;
    }

    // Updating the occupied rows
    occ = minIndex - 1;

    // Updating the segment trees
    this->updateSumTree(minIndex, seats - k);
    this->updateMaxTree(minIndex, seats - k);
    return true;
}
```

6 CANDY (GREEDY APPROACH)



```
class Solution {
public:
    int candy(vector<int>& A) {

        int n = A.size();

        vector<int> ans(n, 1);

        for(int i=1; i<n; i++) {
            if(A[i]>A[i-1]) {
                ans[i] = ans[i-1] + 1;
            }
        }

        for(int i=n-1; i>=1; i--) {

            if(A[i-1]>A[i]) {
                ans[i-1] = max(ans[i] + 1, ans[i-1]);
            }
        }

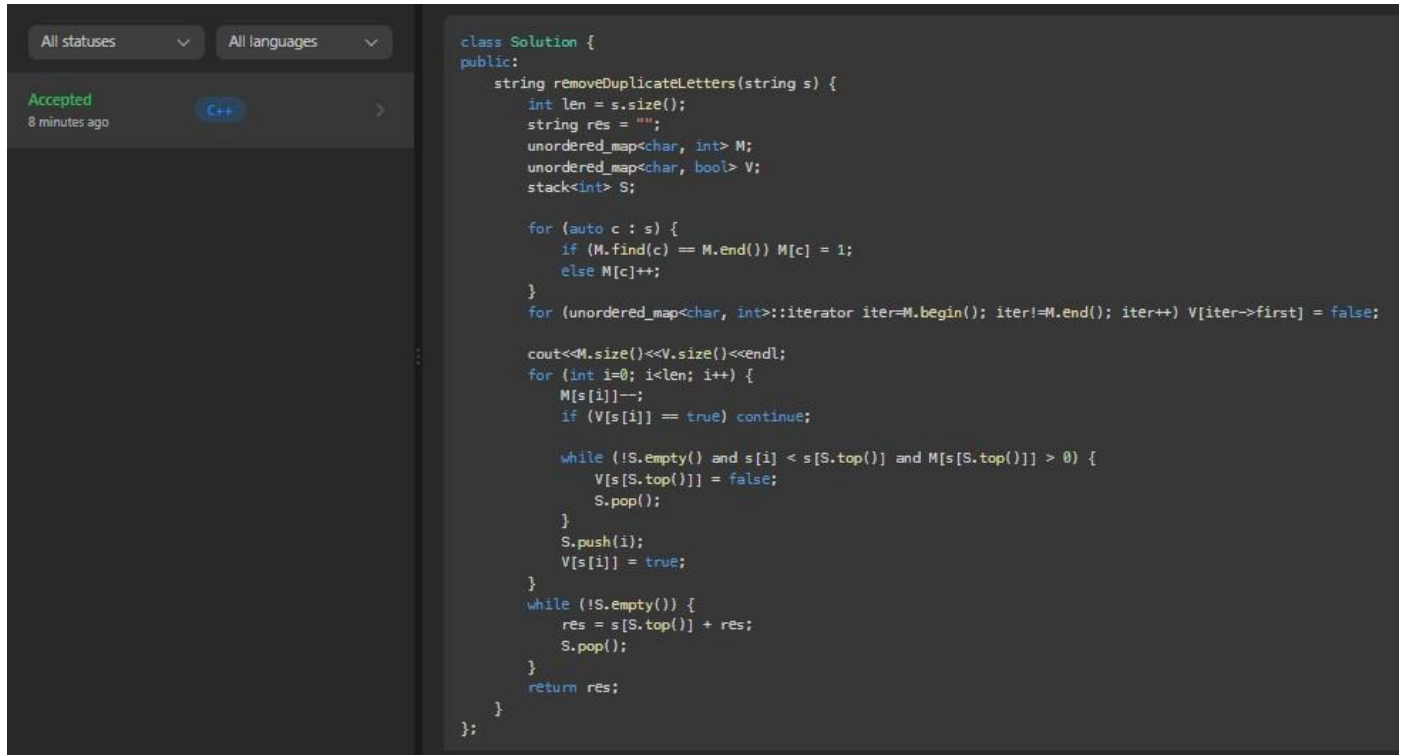
        int sum = 0;

        for(int i=0; i<n; i++) {
            sum += ans[i];
        }

        return sum;
    }
};
```

Question 7. REMOVE DUPLICATE LETTERS (GREEDY APPROACH)

Question .



```
class Solution {
public:
    string removeDuplicateLetters(string s) {
        int len = s.size();
        string res = "";
        unordered_map<char, int> M;
        unordered_map<char, bool> V;
        stack<int> S;

        for (auto c : s) {
            if (M.find(c) == M.end()) M[c] = 1;
            else M[c]++;
        }
        for (unordered_map<char, int>::iterator iter=M.begin(); iter!=M.end(); iter++) V[iter->first] = false;

        cout<<M.size()<<V.size()<<endl;
        for (int i=0; i<len; i++) {
            M[s[i]]--;
            if (V[s[i]] == true) continue;

            while (!S.empty() and s[i] < s[S.top()] and M[s[S.top()]] > 0) {
                V[s[S.top()]] = false;
                S.pop();
            }
            S.push(i);
            V[s[i]] = true;
        }
        while (!S.empty()) {
            res = s[S.top()] + res;
            S.pop();
        }
        return res;
    }
};
```

Question 8. AVOID FLOOD IN THE CITY (GREEDY APPROACH)

Accepted

Next question

1489. Find Critical and Pseudo-Critical Edges in Minimum Spanning Tree

More challenges

2312. Selling Pieces of Wood

1002. Find Common Characters

485. Max Consecutive Ones

All statuses

All languages

Accepted
a minute ago

C++

```

class Solution {
public:
    vector<int> avoidFlood(vector<int>& rains) {
        vector<int>ans;
        unordered_map<int,int>mp;
        int size=rains.size();
        set<int>st;
        for(int i=0;i<size;i++){
            if(rains[i]==0){
                st.insert(i);
                ans.push_back(1);
            }
            else{
                if(mp.find(rains[i])!=mp.end()){
                    auto it=st.lower_bound(mp[rains[i]]);
                    if(it==st.end())
                        return {};
                    ans[*it]=rains[i];
                    st.erase(*it);
                }
                mp[rains[i]]=i;
                ans.push_back(-1);
            }
        }
        return ans;
    }
};

```

Question 9. CINEMA SEAT ALLOCATION (GREEDY APPROACH)

Accepted

Next question

1387. Sort Integers by The Power Value

More challenges

1467. Probability of a Two Boxes Having The Same Number of Distinct Balls

2401. Longest Nice Subarray

1060. Missing Element in Sorted Array

All statuses

All languages

Accepted
a few seconds ago

C++

```

class Solution {
public:
    void isPlace(vector<int>seat, bool &lplace,bool &rplace,bool &mplace){
        for(int i=0;i<seat.size();i++){
            if(seat[i]>=1 && seat[i]<=4)lplace=false;
            if(seat[i]>=3 && seat[i]<=6)mplace=false;
            if(seat[i]>=5 && seat[i]<=8)rplace=false;
        }
    }
    int maxNumberOfFamilies(int n, vector<vector<int>>& reservedSeats) {
        map<int,vector<int>>booked;
        int res=0;
        for(int i=0;i<reservedSeats.size();i++){
            booked[reservedSeats[i][0]-1].push_back(reservedSeats[i][1]-1);
        }
        int b=booked.size();
        res=(n-b)*2;

        for(auto it=booked.begin();it!=booked.end();it++){
            bool lplace=true,rplace=true,mplace=true;
            isPlace(it->second,lplace,rplace,mplace);
            if(mplace && lplace && rplace)res+=2;
            else if(!lplace && !rplace && mplace)res+=1;
            else if(lplace || mplace || rplace)res+=1;
        }
        return res;
    }
};

```

10 RABBITS IN FOREST (GREEDY APPROACH)

Question .

✓ Accepted

Next question

- 782. Transform to Chessboard

More challenges

- 2336. Smallest Number in Infinite Set
- 1224. Maximum Equal Frequency
- 985. Sum of Even Numbers After Queries

All statuses ▾ All languages ▾

Accepted
a few seconds ago

C++ >

```
class Solution {
public:
    int numRabbits(vector<int>& answers) {
        sort(answers.begin() , answers.end());
        int cnt = 1, len = 0, sum=0, extra=0;

        for(int i=0; i<answers.size(); i++)
        {
            if( i==answers.size()-1 || answers[i]!=answers[i+1]){
                int modValue;
                modValue = cnt%(answers[i]+1);
                if(modValue) extra+=(answers[i]+1-modValue);
                cnt=1;
            }else{
                cnt++;
            }
        }

        return answers.size()+extra ;
    }
};
```