ANSWER 1 :

```cpp
#include<bits/stdc++.h>
using namespace std;

vector<int> quick_sort(vector<int> a){
    int pivot = a.size()/2;
    if(a.size()<= 1)
        return a;

    vector<int>left, right;

    for(int i=0; i<a.size(); i++){
        if(i==pivot)
            continue;
        else if(a[i]<=a[pivot])
            left.push_back(a[i]);
        else
            right.push_back(a[i]);
    }

    vector<int>sorted_left = quick_sort(left);
    vector<int>sorted_right = quick_sort(right);
    vector<int>sorted_a;

    for(int i=0; i<sorted_left.size(); i++)
        sorted_a.push_back(sorted_left[i]);

    sorted_a.push_back(a[pivot]);

    for(int j=0; j<sorted_right.size(); j++)
        sorted_a.push_back(sorted_right[j]);

    return sorted_a;
}
```

```cpp
int main()
{
    int t;cin>>t;
    vector<int>x(t);
    for(int i=0; i<t; i++)
        cin>>x[i];
    x = quick_sort(x);
    for(int j=t-1; j>=0; j--)
        cout<<x[j]<<" ";
    return 0;
}
```

ANSWER - 2 :

```cpp
#include<bits/stdc++.h>
using namespace std;

int main()
{
    int n, p;
    cin>>n;
    vector<int> x(n+1);
    for(int i=1; i<n; i++){
        cin>>p;
        x[p] = 1;
    }
    for(int i=1; i<=n; i++){
        if(x[i]!=1)
            cout<<i;
    }
    return 0;
}
```

ANSWER - 3 :

```cpp
#include<bits/stdc++.h>
using namespace std;

int cnt=0, n, k;
vector<int>merge_sort(vector<int>a){
    if(a.size()<=1)return a;
    int mid = a.size()/2;
    vector<int>left, right;
    for(int i=0; i<mid; i++)
        left.push_back(a[i]);
    for(int j=mid; j<a.size(); j++)
        right.push_back(a[j]);
    vector<int>sorted_left = merge_sort(left);
    vector<int>sorted_right = merge_sort(right);
    vector<int>sorted_a;

    int idx=0, idx2=0;
    for(int i=0; i<a.size(); i++){
        if(sorted_left.size() == idx){
            sorted_a.push_back(sorted_right[idx2]);
            idx2++;
        }
        else if(sorted_right.size() == idx2){
            sorted_a.push_back(sorted_left[idx]);
            idx++;
        }
        else if(sorted_left[idx] <= sorted_right[idx2]){
            sorted_a.push_back(sorted_left[idx]);
            idx++;
        }
        else if(sorted_right[idx2] < sorted_left[idx]){
            sorted_a.push_back(sorted_right[idx2]);
            idx2++;
        }
    }
```

```cpp
    if(sorted_a.size() == n){
        int l=0, r=n-1;
        while(l<r){
            if(sorted_a[l]+sorted_a[r]<k)
                l++;
            else if(sorted_a[l]+sorted_a[r]>k)
                r--;
            else if(sorted_a[l]+sorted_a[r]==k){
                cnt++;
                l++;
                r--;
            }
            if(l==r)break;
        }
    }
    return sorted_a;
}
int main()
{
    cin>>n;
    vector<int>x(n);
    for(int i=0; i<n; i++)
        cin>>x[i];
    cin>>k;
    merge_sort(x);
    cout<<cnt<<endl;
    return 0;
}
```

ANSWER - 4 :

```cpp
#include<bits/stdc++.h>
using namespace std;

bool bi_search(vector<int>a, int n){
```

```cpp
        int mid = a.size()/2;
        int low=0, high=a.size()-1;
        while(low<=high){
            mid = (low+high)/2;
            if(n<a[mid]){
                high = mid-1;
            }
            else if(n>a[mid]){
                low = mid + 1;
            }
            else if(n==a[mid])
                return true;
        }
        return false;
}
int main()
{
    int t1;cin>>t1;
    vector<int>x(t1);
    for(int i=0; i<t1; i++)
        cin>>x[i];

    int t2; cin>>t2;
    vector<int>y(t2);
    for(int j=0; j<t2; j++)
        cin>>y[j];

    sort(x.begin(), x.end());
    sort(y.begin(), y.end());

    for(int j=0; j<x.size(); j++){
        if(!bi_search(y, x[j])){
            cout<<"NO";
            return 0;
        }
    }
```

```
    }
    cout<<"YES";
    return 0;

}
```

ANSWER - 5 :

```cpp
#include<bits/stdc++.h>
using namespace std;

class node {
public:
    int data;
    node *next;
};

class LinkedList{
public:
    node *head;

    LinkedList()
    {
        head = NULL;
    }
    node* CreateNewNode(int x){
        node *newnode = new node;
        newnode->data = x;
        newnode->next = NULL;

        return newnode;
    }
    void InsertAtHead(int x){
        node *a = CreateNewNode(x);
        if(head == NULL){
```

```cpp
        head = a;
        return;
    }
    a->next = head;
    head = a;
}

void Traverse(){
    node *a = head;
    while(a!=NULL){
        cout<<a->data<<" ";
        a = a->next;
    }
    cout<<endl;
}
int getValue(int x){
    node *a = head;
    int idx = 0;
    while(a!=NULL){
        if(idx == x){
            return a->data;
        }
        a = a->next;
        idx++;
    }
    return -1;
}
int getSize(){
    int cnt=0;
    node *a = head;
    while(a!=NULL){
        cnt++;
        a = a->next;
    }
    return cnt;
```

```cpp
    }
    void areverse(node* a){
        if (a == NULL) return;
        areverse(a->next);
        cout<<a->data<<" ";
    }
    void printReverse(){
        node *a = head;
        areverse(a);
        cout<<"\n";
    }
    void swapFirst(){
        node *a = head;
        head = a->next;
        a->next = head->next;
        head->next = a;
    }


};
int main()
{
    LinkedList l;
    cout<<l.getSize()<<"\n";
    l.InsertAtHead(5);
    cout<<l.getSize()<<"\n";
    l.InsertAtHead(6);
    l.InsertAtHead(30);
    cout<<l.getSize()<<"\n";
    l.InsertAtHead(20);
    l.InsertAtHead(30);
    cout<<l.getValue(2)<<"\n";
    cout<<l.getValue(6)<<"\n";
    l.printReverse();
    l.Traverse();
```

```
        l.swapFirst();
        l.Traverse();
        l.printReverse();

}
```

ANSWER - 6 :

```
#include<bits/stdc++.h>
using namespace std;

int bi_search(vector<int>a, int n){
    int cnt=0;
    int mid = a.size()/2;
    int low=0, high=a.size()-1;
    while(low<=high){
        mid = (low+high)/2;
        if(n<a[mid]){
            high = mid-1;
        }
        else if(n>a[mid]){
            low = mid + 1;
        }
        else if(n==a[mid]){
            low = mid+1;
            cnt++;
        }
    }
    return cnt;
}
int main()
{
    int t;cin>>t;
    vector<int>x(t);
    for(int i=0; i<t; i++)
```

```cpp
        cin>>x[i];
    int k;cin>>k;
    sort(x.begin(), x.end());
    if(bi_search(x, k)>1)
        cout<<"YES";
    else
        cout<<"NO";
    return 0;
}
```

ANSWER - 7 :

```cpp
#include<bits/stdc++.h>
using namespace std;

int main()
{
    int t;cin>>t;
    vector<int>x(t);
    for(int i=0; i<t; i++)
        cin>>x[i];
    int a;cin>>a;
    int b;cin>>b;
    x.erase(x.begin()+a-1, x.begin()+b);
    for(int j=0; j<x.size(); j++)
        cout<<x[j]<<" ";
    return 0;
}
```

ANSWER - 8 :

```cpp
#include<bits/stdc++.h>
using namespace std;
```

```cpp
vector<int>rev(vector<int>a){
    vector<int>ans;
    for(int i=0; i<a.size(); i++){
        if(a[i]%2==0){
            ans.push_back(a[i]);
        }
    }
    return ans;
}
int main()
{
    vector<int>x = {5, 4, 2, 8, 10};
    vector<int>ans = rev(x);
    for(int j=0; j<ans.size(); j++)
        cout<<ans[j]<<" ";
    return 0;
}
```