Question 1

Done

Question 2

#include<iostream>

using namespace std;

int main()

{

int t;

cout<<"enter the number of test case : ";

cin>>t;

while(t--)

{

int n;

cout<<"\nenter the number element in the array: ";

cin>>n;

int arr[n];

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

{

cout<<"enter the "<<i+1<<"th element : ";

cin>>arr[i];

}

// sorting

int j;

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

{

int temp =arr[i];

for(j=i-1;j>=0;j--)

{

if(arr[j]>temp)

{

arr[j+1]=arr[j];

}

else

{

break;

}

}

arr[j+1]=temp;

}

int k=0;

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

{

if(arr[i]==arr[i+1])

{

k++;

i++;

while(arr[i]==arr[i+1]) i++;

}

else k++;

}

int arrnew[k];

int l=0;

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

{

if(arr[i]==arr[i+1])

{

arrnew[l++]=arr[i];

i++;

while(arr[i]==arr[i+1]) i++;

}

else arrnew[l++]=arr[i];

}

cout<<"\n the array of unique element is : ";

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

{

cout<<arrnew[i]<<" ";

}

}

}

Question 3

#include<iostream>

using namespace std;

int main()

{

int t;

cout<<"enter the number of test case : ";

cin>>t;

while(t--)

{

int n;

cout<<"\nenter the number element in the array: ";

cin>>n;

int arr[n];

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

{

cout<<"enter the "<<i+1<<"th element : ";

cin>>arr[i];

}

int key;

cout<<"enter the key : ";

cin>>key;

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

{

if(arr[i]==key)

{

cout<<"the key is present : ";

break;

}

}

cout<<"the key is not present ";

}

}

}

Question 4

#include<iostream>

using namespace std;

int main()

{

int t;

cout<<"enter the number of test case : ";

cin>>t;

while(t--)

{

int n;

cout<<"\nenter the number element in the array: ";

cin>>n;

int arr[n];

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

{

cout<<"enter the "<<i+1<<"th element : ";

cin>>arr[i];

}

// sorting

int j;

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

{

int temp =arr[i];

for(j=i-1;j>=0;j--)

{

if(arr[j]>temp)

{

arr[j+1]=arr[j];

}

else

{

break;

}

}

arr[j+1]=temp;

}

int key;

cout<<"enter the key : ";

cin>>key;

int s=0;

int e=n-1;

int mid;

bool flag = false;

while(s<=e)

{

mid=s+(e-s)/2;

if(arr[mid]==key)

{

cout<<"the element is present ";

flag =true;

break;

}

else if(arr[mid]>key)

{

e=mid-1;

}

else s=mid+1;

}

if(!flag)

{

cout<<"element is not present ";

}

}

}

Extra question

#include<iostream>

using namespace std;

void solve(int arr[],int s,int e,int key)

{

int mid=s+(e-s)/2;

if(s>e)

{

cout<<"the element is not present \n ";

return;

}

if(arr[mid]==key)

{

cout<<"the element is present : \n";

return;

}

else if(arr[mid]>key)

{

e=mid-1;

solve(arr,s,e,key);

}

else{ s=mid+1;

solve(arr,s,e,key);

}

}

int main()

{

int t;

cout<<"enter the number of test case : ";

cin>>t;

while(t--)

{

int n;

cout<<"\nenter the number element in the array: ";

cin>>n;

int arr[n];

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

{

cout<<"enter the "<<i+1<<"th element : ";

cin>>arr[i];

}

// sorting

int j;

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

{

int temp =arr[i];

for(j=i-1;j>=0;j--)

{

if(arr[j]>temp)

{

arr[j+1]=arr[j];

}

else

{

break;

}

}

arr[j+1]=temp;

}

int key;

cout<<"enter the key : ";

cin>>key;

solve(arr,0,n-1,key);

}

}