Week 2

Question 1:

```cpp
#import<iostream>
using namespace std;
int binary(int arr[],int l,int r, int x)
{
    if(r>=l){
        int mid=l+(r-l)/2;

    if(arr[mid]==x)
        return mid;

    if(arr[mid]>x)
        return binary(arr,l,mid-1,x);

        return binary(arr,mid+1,r,x);
    }
    return -1;
}
int main()
{
    int T;
    cout<<"enter the number of test cases"<<endl;
    cin>>T;
    while(T--)
    {
        int a[100],n,k;
        int c=0;
```

```cpp
    cout<<"enter the number of elements"<<endl;
    cin>>n;
    cout<<"enter the elements"<<endl;
    for(int i=0;i<n;i++)
      cin>>a[i];
      cout<<"enter the element to be searched"<<endl;
    cin>>k;
    int f=binary(a,0,n-1,k);
    if(f!=-1)
    {
      int j=f+1;
      while(a[f--]==k)
      {
        c++;
      }
      while(a[j++]==k)
      {
        c++;
      }
      cout<<k<<"-"<<c<<endl;
    }
    else
      cout<<"Key not found"<<endl;
  }


  return 0;
}
```

Output:

enter the number of test cases

3

enter the number of elements

10

enter the elements

235 235 278 278 763 764 790 853 981 981

enter the element to be searched

981

981-2

enter the number of elements

15

enter the elements

1 2 2 3 3 5 5 5 25 75 75 75 97 97 97

enter the element to be searched

75

75-3

enter the number of elements

5

enter the elements

1 2 2 3 4

enter the element to be searched

5

Key not found

Process returned 0 (0x0)   execution time : 110.122 s

Press any key to continue.

Question 2:

```cpp
#import<iostream>
using namespace std;
int main()
{
    int T;
    cout<<"enter the number of test cases"<<endl;
    cin>>T;
    while(T--)
    {
        int a[100],n,i,j,k;
        cout<<"enter the number of elements"<<endl;
        cin>>n;
        cout<<"enter the elements"<<endl;
        for(i=0;i<n;i++)
            cin>>a[i];
            int flag=0;

        for(i=0;i<n;i++)
        {
            for(j=i+1;j<n;j++)
            {
                int sum=a[i]+a[j];
                for(k=j+1;k<n;k++)
                {
                    if(sum==a[k])
                    {
                        flag=1;
                        break;
```

```cpp
                }
            }
          if(flag==1)
              break;
        }
      if(flag==1)
          break;
    }
    if(flag==1)
      cout<<"value of i ,j and k: "<<i+1<<","<<j+1<<","<<k+1<<endl;
    else
      cout<<"No sequence found."<<endl;
  }
  return 0;
}
```

Output:

enter the number of test cases

3

enter the number of elements

5

enter the elements

1 5 84 209 341

No sequence found.

enter the number of elements

10

enter the elements

24 28 48 71 86 89 92 120 194 201

value of i ,j and k: 2,7,8

enter the number of elements

15

enter the elements

64 69 82 95 99 107 113 141 171 350 369 400 511 590 666

value of i ,j and k: 1,6,9

Process returned 0 (0x0)   execution time : 97.041 s

Press any key to continue.

Question 3:

```cpp
#import<iostream>
#import<cstdlib>
using namespace std;
int main()
{
    int T;
    cout<<"enter the number of test cases"<<endl;
    cin>>T;
    while(T--)
    {
        int a[100],n,i,j;
        int key;
        cout<<"enter the number of elements"<<endl;
        cin>>n;
        cout<<"enter the elements"<<endl;
        for(i=0;i<n;i++)
            cin>>a[i];
            cout<<"enter the key"<<endl;
        cin>>key;
        int c=0;

        for(i=0;i<n;i++)
        {
            for(j=i+1;j<n;j++)
            {
                int diff=abs(a[i]-a[j]);
                if(diff==key)
                    c++;
            }
```

```
    }
    cout<<"number of such pairs:"<<c<<endl;
  }
  return 0;
}
```

Output:

enter the number of test cases

3

enter the number of elements

5

enter the elements

1 51 84 21 31

enter the key

20

number of such pairs:2

enter the number of elements

10

enter the elements

24 71 16 92 12 28 48 14 20 22

enter the key

4

number of such pairs:4

enter the number of elements

5

enter the elements

1 2 3 4 5

enter the key

5

number of such pairs:0

Process returned 0 (0x0)   execution time : 65.493 s

Press any key to continue.