IIT 2025105

Q1

```
# include <stdio.h >

int main () {
                  int n;
                  scanf ("%d", &n);
                printf (" Enter Sorted Array : ");
        int a[n];
        for( int i = 0 ; i<n ; i++) {

                scanf ("%d", &a[i]);
           }

        printf (" Enter Target Sum : ");
        int target;
        scanf ("%d ", & target );

        int l=0, r = n-1;

      while (l<r) {
                int sum = a[l] + a[r] ;

        if ( sum == target) {
                        printf ("(%d , %d)", a[l] ,a[r]);
                        return 0;
                 }
        else if ( sum < target) {
                                           l++;
                                     }

           else {
                     r--;
                 }
        }
        printf("-1");

    return 0;

}
```

Q2

```
# include <stdio.h>

int main() {
        int a[] = {1, 3, 8, 12 , 4, 2};
        int n = 6;

    int i = 0 , j = n-1;

    while (i<j) {
            int mid = i+(j-i)/2 ;

        if(a[mid] < a[mid+1]) {
                i = mid+1;
        }
        else {
                j = mid;
        }
    }

    printf(" Peak element: %d", a[i]);

    return 0;

}
```

Q3

```
# include <stdio.h>

int  ternarysearch( int arr[], int left, int right, int key){
    if ( left > right)
                return -1;

    int mid1= left + (right - left) /3
    int mid2 = right - ( right-left) /3

    if ( arr [mid1] == Key )
                        return mid1;
    if ( arr[mid2] == Key)
                        return mid2;

    if ( Key < arr [mid1]) {

            return ternary Search(arr, left, mid1-1, Key);
    }
  else if( Key > arr [mid2] ) {

            return ternary Search( arr, mid1+1, ~~mid2-1~~ right, Key);
    }
  else {
        return ternary Search(arr, mid1 +1, mid2-1, Key);
    }
};
```

```
int  main( ) {
     int n,k;
     scanf ( "%d ", &n);
     printf(" Enter  Sorted array :  ");
      int a[n];
     for(int i=0 ; i< n ; i++){
               scanf( "%d", &a[i]);
      }
     printf (" Enter key :  ");
     scanf ("%d", &k);

     printf("Index : %d", ternary Search (a, 0, n-1, k)

   return 0;

}
```

Q4

```
#include<stdio.h>

int binary Search( int arr[ ], int left, int right, int key){

    while( left <= right) {
          int mid = left + (right - left) /2 ;

        if (arr[mid] == key)
                      return mid;
        else if (arr[mid] < key)
                    left = mid +1;
        else
                right = mid -1;
    }
    return -1;
}
```

```
int exponentialSearch (int arr[], intn, int Key) {

    if (arr[0] == Key)
            return 0;

    int i = 1;
    while( i < n && arr [i] <= Key)
            i = i * 2;
     int left = i/2;
     int right = (i < n) ? i : n-1;

     return binarySearch( arr, left, right, Key);
}

  int main() {
        int n;
        scanf ("%d", &n);
        printf ("Enter Sorted Array: ");
         int a[n];
       for (int i=0 ; i<n ; i++) {
                scanf("%d", &a[i]);
          }


     printf ("Enter key : ");
      int k;
     scanf ("%d";&k);

printf(" Podition using Binary search: %d \n", binarysearch (a,0,n-1,k));
printf(" Position using Exponential Search: %d\n", exponentialsearch(a,0,n-1

   return 0;
}
```