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1  /* Given an already sorted array of positive integers, design an algorithm and implement it using a
2  program to find whether a given key element is present in the sorted array or not. For an array
3  arr[n], search at the indexes arr[0], arr[2], arr[4],.....,arr[2k] and so on. Once the interval (arr[2k]<
key < arr[ 2k+1] ) is found, perform a linear search operation from the index 2k
4  to find the element key. (Complexity < O(n), where n is the number of elements need to be scanned for
searching):
5  Jump Search
6  */
7
8  #include <stdio.h>
9  #include <math.h>
10 int jumpsearch(int arr[], int n, int key)
11 {
12     int step = sqrt(n);
13     int prev = 0;
14     int min = (step < n)? step : n;
15     while (arr[min - 1] < key)
16     {
17         prev = step;
18         step = step +sqrt(n);
19         if (prev >= n)
20             return -1;
21     }
22     for (int i = prev; i < min; i++)
23     {
24         if (arr[i] == key)
25             return i;
26     }
27     return -1;
28 }
29 int main()
30 {
31     int T;
32     scanf("%d", &T);
33     while (T--)
34     {
35         int n;
36         printf("enter size of array: ");
37         scanf("%d", &n);
38         int arr[n];
39         printf("enter elements in array: ");
40         for (int i = 0; i < n; i++)
41         {
42             scanf("%d", &arr[i]);
43         }
44         int key;
45         scanf("%d", &key);
46         int result = jumpsearch(arr, n, key);
47         if (result != -1)
48             printf("Present ");
49         else
50             printf( "Not Present ");
51     }
52     return 0;
53 }

```