Target Sum pair with BINARY SEARCH

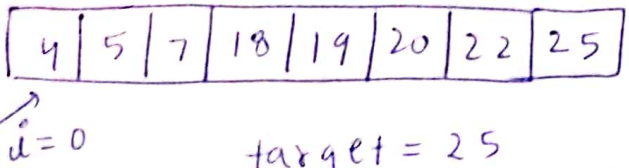
```
public static void main (String [] args) {
Scanner s = new Scanner (System.in);
int target = s.nextInt();
int n = s.nextInt();
int [] arr = new int [n];
for(int i=0; i<arr.length; i++)
 {  arr[i] = s.nextInt();
 }
Arrays.sort(arr); ]→nlogn (T.C)
For( int i=0; i<arr.length; i++)]
{ int theOtherNumber = tar-arr[i];
  if (theOtherNumber < arr[i] )]
   {  break;
   }
int left = 0;
int right = arr.length-1;
while(left <= right)
{ int mid = (left+right)/2;
   if(theOtherNumber < arr[mid])
    {  right = mid+1;
    }
   else if (theOtherNumber > arr[mid])
    {  left = mid+1;
    }
   else
    {
    System.out.println(arr[i]+" "+arr[mid]);
      break;
    }
  }
}
```

→ Sorted Array me loop lagaya

→ Agar pair ka First no. hai arr[i] toh Fir dusra no. arr[i] se bada hoga!

→ Agar arr[i] bada hua dusre no. se toh it means → pair is repeating in reverse order, vo hum print nahi krengy toh break laga diya!

nlogn



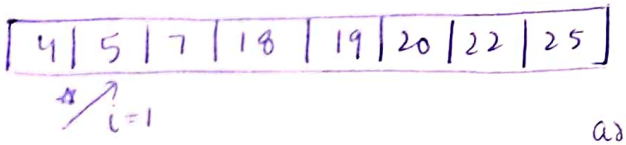
target = 25

$\therefore$ 21 > (4) → arr[i]

$\therefore$ arr[i] = 4 (i = 0)

other Number = 25 − 4 = 21 (target − arr[i])

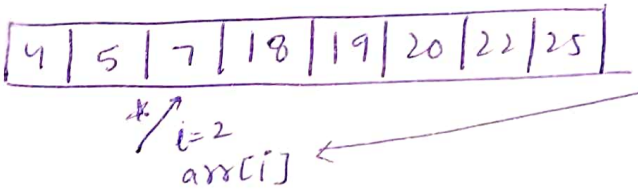
$\therefore$ 21 array me nahi mila



(5) < (20) → arr[i]

$\therefore$ other Number = 25 − 5 = 20

Now, we search in array [Binary Search], we Find (20) at index (5), so we will print this pair. (5, 20)

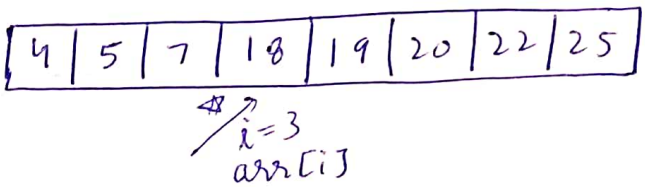


7 < (18)

other Number = 25 − 7 = 18

Now, we search (18) in Array, we Find (18) at index (3), using Binary Search. we will print this pair

(7, 18)



other Number = 25 − 18 = 7

$\therefore$ arr[i] > other no.

$\therefore$ will break the loop ← Because ← (7,18) pair Hum phele hi print kr chuke hai!

Aur Hum ek baar aur loop chalaty toh (18,7) pair print hota!

$\therefore$ So, SAME PAIR Firse print hojayega!

nlogn [SORTING] + nlogn [BINARY SEARCH] → O(nlogn) Overall