1. **Alogorthm is a procedure of step by step to problem solving**

**2. Data structure means how to organise & reserve data . If multiple data occure,data must be structured**

**3. Searching are two types. These are-**

**i.Linear Search (Sorted or Unsorted)**

**ii. Binary Search (Sorted)**

**4. Binary Search**

**Binary data is using divide & conqueer approach. Divide & conqueer is using array & tree . It's not using linked list.Binary data also using character data. it's dependig on ASCII value**

**In binary searching, while loop is using .Beacause,data is not fixed**

**Since we don't know how many times the loop will run, here we use while-loop.**

**There are 3 conditions inside the loop.**

**i. If the mid index value matches the target value, then that index will return.**

**ii. If the value of midIndex is less than the value of target, the value of firstIndex is added to midIndex by 1 and the midValue is updated according to the new index range.**

**iii. If the value of midIndex is greater than the value of target, then the value of lastIndex will be minus 1 with midIndex and the midValue will be updated according to the new index range.**

**In this way the loop will continue until firstIndex and lastIndex are equal or less.**

**Then and if the target value is not found, the loop terminates and returns -1. -1 means the element was not found in the array.**

**5. Order Agnostic Binary Search**

**While applying binary search we have to know about the order of the element. But what if we don’t know whether the order is ascending or descending? Will we not be able to apply Binary Search Then?**

**We know order matter in binary search. When the order is ascending we are using binary in a way and when the order is descending then we are reversing the system. Order agnostic means that kind of system where order doesn’t matter. Whether is it in ascending order or descending order it will work perfectly when we will use order agnostic binary search.**

**⇒At first we have to check the first and last element of an array. By comparing them we will make the decision about the order.**

**if the end is greater than the start, then it is an increasing order array which means the order is ascending.**

**if the start is greater than the end, then it is a decreasing order array which means the order is descending.**

**6. Complexity**

**i. Linear Search: O(n)**

**ii. Binary Search: O(log(n)) + Sorted**

**7. If space complexity not declared ,we can choose array,object,linked list or any.**

**But If declared O(1),we can select a single variable. We can’t select a data format,that store collection as like array,linked list etc**

**8. There are 4 types of binary search. These are-**

**i. Direct Binary Search**

**ii. Ceiling & Flooring of a number**

**iii. Number of occurance of duplicate**

**iv. Peak of mountain array**

**9. If order is not declared in binary search, order agnostic binary search will be used**