Sunbeam Institute of Information Technology

Pune and Karad

PreCAT

Module – Data Structures

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Searching Algorithm : Linear Search

- Search a number in a list of given numbers (random order)

- **Algorithm**
  - Step 1: Accept key from user
  - Step 2: Traverse list from start to end
  - Step 3: Compare key with each element of the list
  - Step 4: If key is found return true else false

```
Algorithm linear_search(a, s, k)
{
        for(i = 0 ; i < s ; i++ )
        {
                if(a[i] == key)
                        return true;
        }
        return false;
}
```

Searching Algorithm : Binary Search

- Given an integer x and integers A0, A1, …An-1, which are pre-sorted and already in memory, find i such that Ai = x or return i = -1 if x is not in the input

- **Algorithm**
  - Step 1: Accept key from user
  - Step 2: Check if x is the middle element. If so x is found at mid
  - Step 3: If x is smaller than the middle element, apply same strategy to the sorted subarray to the left of middle element.
  - Step 4: If x is larger than the middle element, apply same strategy to the sorted subarray to the right of middle element

Thank you!

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