Data Structures and Algorithm

Chapter - 7.3

Interpolation Search

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Interpolation Search

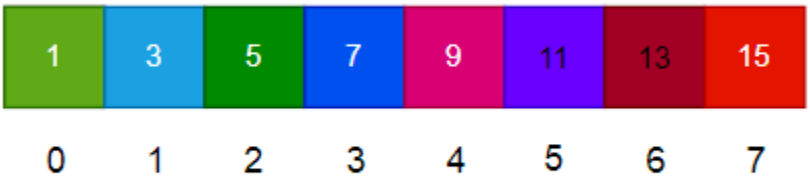
The Interpolation Search is an improvement or an improved variant over Binary Search for instances, where the values in a sorted array are uniformly distributed. For this algorithm to work properly, the data collection **should be in a *sorted form*** and ***equally distributed***.

Algorithm of Linear Search

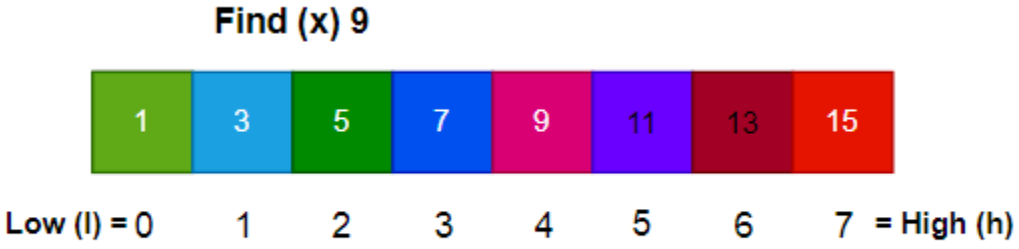
1. Search desire data from middle of the list
2. If data match, return the index of the item, and exit.
3. If data not match, probe position.
4. Divide the list using probing formula and find the new midle.
5. If data is greater than middle, search in higher sub-list.
6. If data is smaller than middle, search in lower sub-list.
7. Repeat until match.

How does Binary Search work?

→ Let we have an sorted array which is uniformly distributed.



→ Identify x (desierd value), l (lowest index of array), h (highest index of array), a[l], a[h]



Here we have to find 9 so x = 9, Low (l) = 0 and High (h) = 7, a[l] = 1, a[h] = 15.

→ Use the formula $Pos = l + ((x - a[l])/(a[h] - a[l])) * (h - l)$

$Pos = 0 + ((9 - 1)/(15 - 1)) * (7 - 0)$

$= 4$

So 9 is at 4th position of the array.

→ Return the found position value.

Result is 4.