

Jump Search in R

Rahul Goswami

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Jump Search is a searching algorithm that is used to find an element in a sorted array. The basic idea of jump search is to search for an element in a sorted array by jumping ahead by fixed steps. The average case time complexity of jump search is $O(\sqrt{n})$
The worst case time complexity of jump search is $O(n)$
The best case time complexity of jump search is $O(\sqrt{n})$ (if the array is already sorted)
The space complexity of jump search is $O(1)$ (in-place)

@param vec Vector to be searched
@param element Element to be searched
@return Index of the element

```
jump.search <- function(vec, element){
  jump_step <- as.integer(sqrt(length(vec)))
  prev_index <- 1
  while(vec[prev_index] < element){
    prev_index <- prev_index + jump_step
    if(prev_index >= length(vec)){
      return("Not Found")
    }
  }

  while(vec[prev_index] < element){
    prev_index <- prev_index + 1
  }

  prev_index-1
}
```

Example

```
sorted_vec <- c(0,1,2,3,4,5,6,7,8,9)
jump.search(sorted_vec, 5)
```

```
## [1] 6
```