JUMP SEARCH

Group: Alpha Mewing Sigma

What is Jump Search

- Jump Search is a search algorithm used to search for data in a sorted array by jumping several indexes at once, then performing a linear search on a particular block.

How does jump search work

- 1. Tentukan ukuran lompatan (step)

$$\text{step} = \sqrt{\{n\}}$$

- 2. Melompat dari satu indeks ke indeks lain sebesar step, sampai nilai yang dicari lebih kecil atau sama dengan elemen saat ini.
- 3. Setelah menemukan blok yang mungkin berisi data, lakukan linear search di dalam blok tersebut.

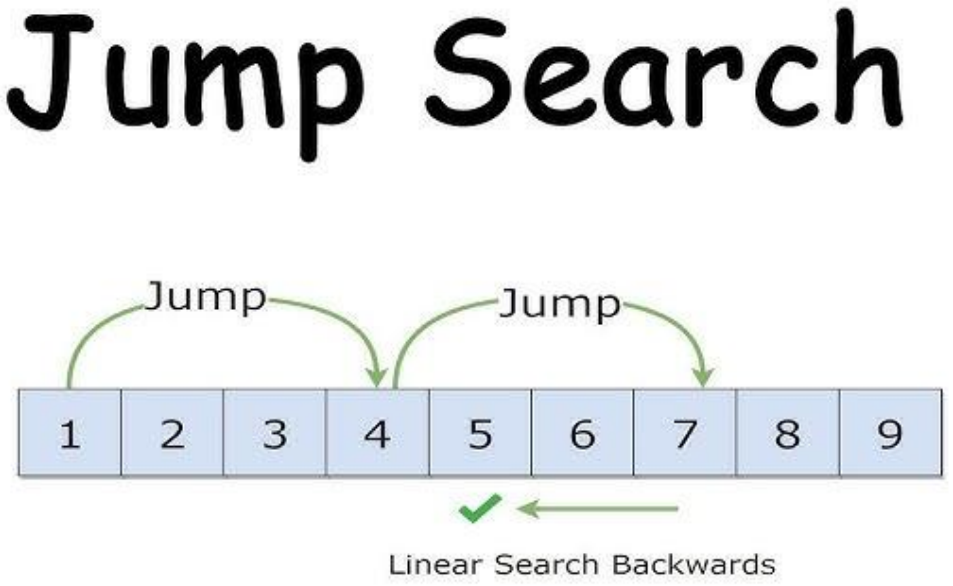
For E xample

Mencari angka 5

Dengan cara $\sqrt{(9)} = 3$

Untuk setiap step melompat 3 kolom

Melompat hingga setidaknya menemukan angka yag dicari atau melebihinya



Time Complexity

- 0 $\sqrt{\{n\}}$

Space Complexity

- 0(1)

```java
public class JumpSearch
{
    public static int jumpSearch(int[] arr, int x)
    {
        int n = arr.length;

        // Finding block size to be jumped
        int step = (int)Math.floor(Math.sqrt(n));

        // Finding the block where element is
        // present (if it is present)
        int prev = 0;
        for (int minStep = Math.min(step, n)-1; arr[minStep] < x; minStep =
Math.min(step, n)-1)
        {
            prev = step;
            step += (int)Math.floor(Math.sqrt(n));
            if (prev >= n)
                return -1;
        }

        // Doing a linear search for x in block
        // beginning with prev.
        while (arr[prev] < x)
        {
            prev++;

            // If we reached next block or end of
            // array, element is not present.
            if (prev == Math.min(step, n))
                return -1;
        }

        // If element is found
        if (arr[prev] == x)
            return prev;

        return -1;
    }

    // Driver program to test function
    public static void main(String [ ] args)
    {
        int arr[] = { 0, 1, 1, 2, 3, 5, 8, 13, 21,
                      34, 55, 89, 144, 233, 377, 610};
        int x = 55;

        // Find the index of 'x' using Jump Search
        int index = jumpSearch(arr, x);

        // Print the index where 'x' is located
        System.out.println("\nNumber " + x +
                           " is at index " + index);
    }
}
```

Output:

```
Number 55 is at index 10
```

CODE

OUR TEAM

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