

Introduction

Pseudocode is a technique used to design and conceptualize algorithms by outlining their logic in a clear and structured manner, without the being limited to a programming language syntax. It employs a simplified and informal language to detail the steps and flow of an algorithm. This approach is to support in understanding and planning how a program or algorithm will function before its actual implementation in code and not limited to computer educated persons alone.

Pseudocode examples

Listing 1: Pseudocode Example

```
1
2  START
3      SET x TO 10
4      IF x > 5 THEN
5          PRINT "x is greater than 5"
6      ENDIF
7  END
```

Listing 2: Binary Search

```
1
2
3  BinarySearch(array, target):
4      low = 0
5      high = length(array) - 1
6
7      while low <= high:
8          mid = (low + high) / 2
9          if array[mid] == target:
10             return mid
11         else if array[mid] < target:
12             low = mid + 1
13         else:
14             high = mid - 1
15
16     return -1 // target not found
```

Example to Binary Search in text context:

Initialize: Start by setting two pointers, low and high. The low pointer is set to the beginning of the array (index 0), and the high pointer is set to the end of the array (index equal to the length of the array minus one).

Iterate: While the low pointer is less than or equal to the high pointer, perform the following steps:

a. **Calculate Midpoint:** Compute the midpoint of the current segment of the array using the formula $\text{mid} = (\text{low} + \text{high}) / 2$

b. **Check Midpoint Value:** - If the value at the midpoint ($\text{array}[\text{mid}]$) is equal to the target value, then the target has been found. Return the index of the midpoint. - If the value at the midpoint is less than the target value, then adjust the low pointer to $\text{mid} + 1$ to search in the upper half of the array. - If the value at the midpoint is greater than the target value, then adjust the high pointer to $\text{mid} - 1$ to search in the lower half of the array.

Not Found: If the low pointer exceeds the high pointer, it means the target value is not present in the array. Return -1 to indicate that the target was not found.

Recommend watching the video which is roughly 2 minutes long on YouTube: Binary Search Algorithm Explained.