**Segment Tree Construction Pattern**

A segment tree is constructed in a specific pattern where each level represents different segment sizes. For an array of size , the segment tree is typically built as follows:

**Construction Pattern**

1. **Level 0 (Root)**: Contains the entire range
2. **Level 1**: Contains 2 segments that split the array into roughly equal halves
3. **Level 2**: Contains up to 4 segments that split each of the previous segments
4. **Level 3**: Contains up to 8 segments, and so on

For the array $$ with :

* **Level 0**: $$ (1 segment)
* **Level 1**: (2 segments)
* **Level 2**: , (4 segments)
* **Level 3**: , (4 segments - note that 8 segments are not needed as individual elements are reached)

**Mathematical Pattern**

* Each node at level covers approximately elements.
* The tree has a height of levels.
* The total number of nodes is approximately .

For :

* Height = levels
* Total nodes = nodes

**Visual Representation**

Level 0: [0,5] (covers all 6 elements)  
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Level 1: [0,2] (3 elements) [3,5] (3 elements)  
 / \ / \  
Level 2: [0,1] (2 elements) [2,2] (1) [3,4] (2 elements) [5,5] (1)  
 / \ / \  
Level 3: [0,0] (1) [1,1] (1) [3,3] (1) [4,4] (1)

The construction follows this pattern of repeatedly dividing segments into roughly equal halves until reaching individual elements.