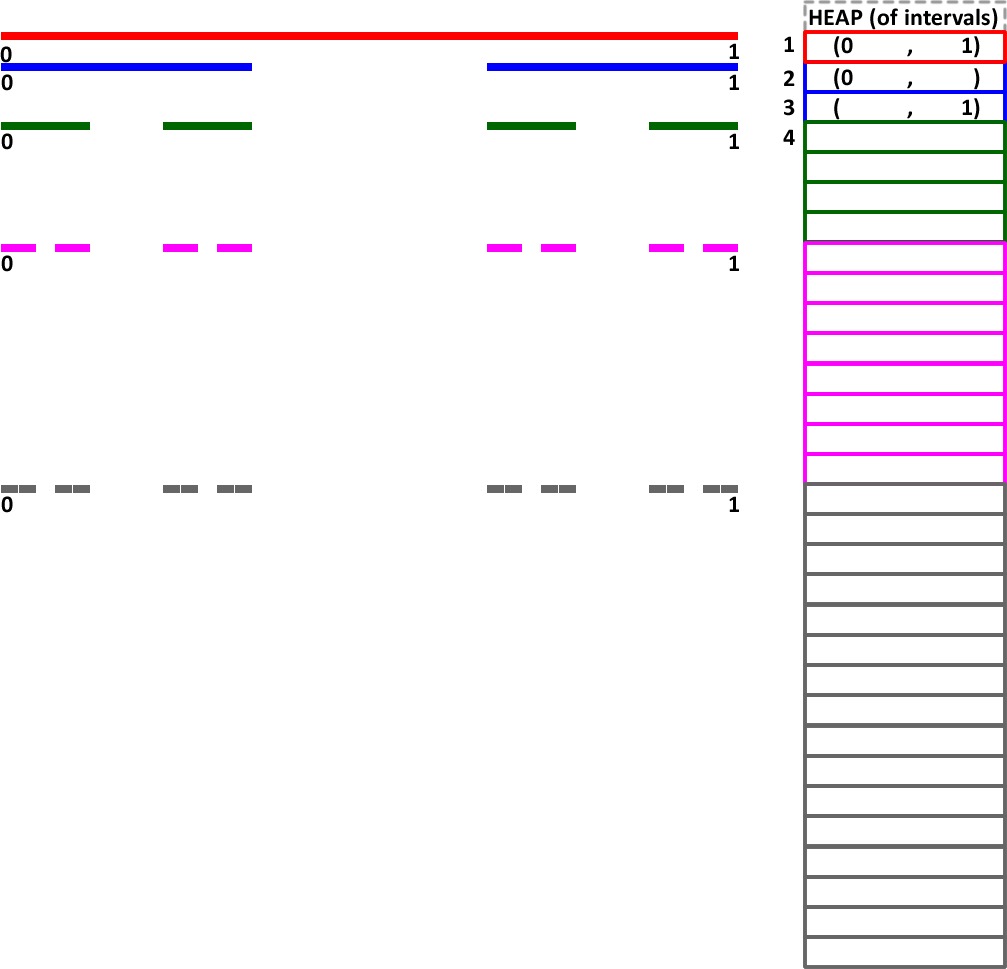
**The Cantor Set**The graphic to the right is an attempt to depict the first few stages in the propagation of the ternary Cantor Set. Starting with a line of unit length (*initiator*), the open middle third is removed (*generator*). This process is repeated at every stage for each line remaining segment.

1. The Cantor Set evolves as a Binary Tree.

a) *Given there is one segment at Stage 0, how many segments are there at Stage n?*

b) *How many total segments are there after n stages?*

2. Given the set is based on the removal of thirds, it is reasonable to define the unmarked endpoints of each segment in base 3. *Do so.*

3. The array that appears to the right of the depiction can be used to record the intervals. *Complete as many intervals as it takes for you to identify a pattern.*

4. Suggest a strategy for *O*(1) access to the intervals corresponding to the *n*’th stage.