Two Pointer Method

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Question:

You are given an integer array height of length n. There are n vertical lines drawn such that the two endpoints of the ith line are (i, 0) and (i, height[i]).

Find two lines that together with the x-axis form a container, such that the container contains the most water.

Return the maximum amount of water a container can store.

Notice that you may not slant the container.

Answer:

Let $i = 0$, $j = \text{height.size}() - 1$, $M = \textbf{Area}(i, j)$.
Then execute the following loop:

Loop:

If $i >= j$, exit loop.
If $\text{height}_i <= \text{height}_j$, let $i = i + 1$.
Else if $\text{height}_i > \text{height}_j$, let $j = j - 1$.
If $\textbf{Area}(i, j) > M$, let $M = \textbf{Area}(i, j)$.

Proof: