

Explanation

Assume the final equal values are x
the total cost function $y = f(x)$ is a **convex function**
on the range of $[\min(A), \max(A)]$.

To find the minimum value of $f(x)$,
we can binary search x by comparing $f(\text{mid})$ and $f(\text{mid} + 1)$.

If $f(\text{mid}) \leq f(\text{mid} + 1)$,
the minimum $f(x)$ is on the left of mid ,
where $x \leq \text{mid}$

If $f(\text{mid}) \geq f(\text{mid} + 1)$,
the minimum $f(x)$ is on the right of $\text{mid} + 1$,
where $x \geq \text{mid} + 1$.

Repeatedly doing this while $\text{left} < \text{right}$,
until we find the minimum value and return it.

This method is known as ternary search,
if we check $f(\text{mid}1)$ and $f(\text{mid}2)$.

Complexity

TIME - $O(N \log(A))$, WHERE A IS THE RANGE OF $A[i]$

SPACE - $O(1)$