Answer

The upper bound of threshold α(α_max) = min(U), which means α_max is equal to the minimal Upper Bound among all term. For example, the α_max is 3 for below table.

term	a	b	c
Upper bound	4	3	5

Prove:

As long as α_max = min(U), then $\forall$ α < α_max, every potential candidate can be calculated, which mean we won't omit any candidates.

But if $\forall$ α >= α_max, we may miss some candidates that can be true candidate. For example, if we have two term A,B, k = 3 and their inverted_index is shown as below table:

A	<1,3>, <2,1>, <3,8>, <4,4>
B	<1,4>, <2,2>, <3,9>, <5,1>

The answer for this condition should be [(7,1), (17,3), (4,4)], if we set α = min(U) = 8, then it would lead to a wrong answer [(7,1), (3,2), (17,3)] as <4,4> can't be evaluated as the upper bound of A is 8 which is not bigger than α.