

Solution 1

```
1 # Copyright © 2020 AlgoExpert, LLC. All rights reserved.
2
3 # O(n) time | O(min(n, a)) space
4 def longestSubstringWithoutDuplication(string):
5     lastSeen = {}
6     longest = [0, 1]
7     startIdx = 0
8     for i, char in enumerate(string):
9         if char in lastSeen:
10             startIdx = max(startIdx, lastSeen[char] + 1)
11         if longest[1] - longest[0] < i + 1 - startIdx:
12             longest = [startIdx, i + 1]
13         lastSeen[char] = i
14     return string[longest[0] : longest[1]]
15
```