**KMP Pattern Matching Substring Search**

1. Created by Donald Knuth

2. idea: find if there are prefix and suffix that are the same:

Text, letter

Description automatically generated

3. First count the number of recurring pattern:

Text, letter

Description automatically generated(3 has some problem)

4. Then do a one time pass on the target String (only move I forward, and j could sometimes backtrack):

Text

Description automatically generated

5. <https://www.youtube.com/watch?v=V5-7GzOfADQ&list=LL&index=7&t=1003s>

6. https://www.geeksforgeeks.org/kmp-algorithm-for-pattern-searching/#:~:text=The%20time%20complexity%20of%20KMP,n)%20in%20the%20worst%20case.&text=The%20Naive%20pattern%20searching%20algorithm,followed%20by%20a%20mismatching%20character.