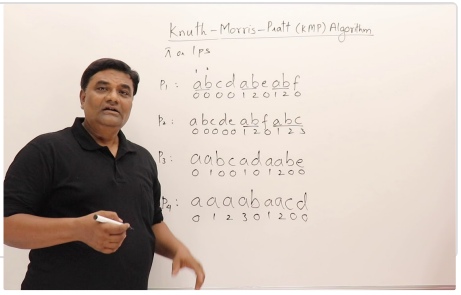
Knuth–Morris–Pratt algorithm

9.1 Knuth-Morris-Pratt KMP String Matching Algorithm

In P3, b is also matching , lps should be 0 1 0 0 1 0 1 2 3 0

Naive Algorithm

https://www.youtube.com/watch?v=V5-7GzOfADQ&ab_channel=AbdulBari



http://whocouldthat.be/visualizing-string-matching/

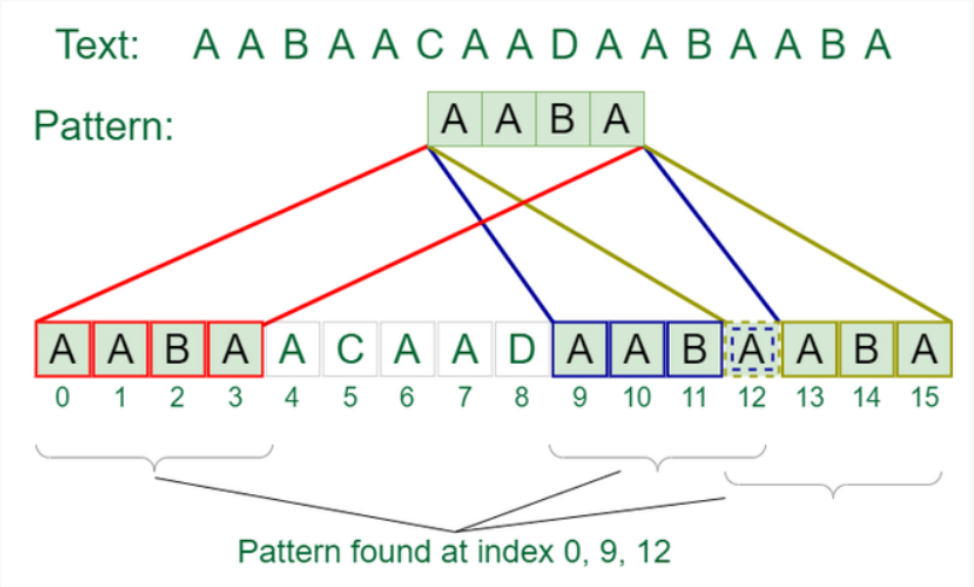
Input: *txt[] = "THIS IS A TEST TEXT", pat[] = "TEST"*

Output: *Pattern found at index 10*

Input: *txt[] = "AABAACAADAABAABA"*

pat[] = "AABA"

Output: *Pattern found at index 0, Pattern found at index 9, Pattern found at index 12*



Arrivals of pattern in the text

-> KMP Algorithm (used for pattern matching)

ex: (a) pattern :- a b c d a b c
1 2 3 4 5 6 7

Sol :- prefix : a, ab, abc, abcd. . . } This is how KMP algorithm solve the problem
Suffix : c, bc, abc, dabc . . . }

(1) String : a b a b a b d
0 1 2 3 4 5 6

Sol : pattern :

a	b	a	b	d
0	1	1	2	0

-> KMP is a string searching Agorithm, that efficiently finds occurences of a pattern within a text.

* The key idea behind KMP is to avoid unnecessary comparisons in the text.

* Time Complexity of KMP is O(n+m).

i.e, n = length of the text
m = length of the pattern.