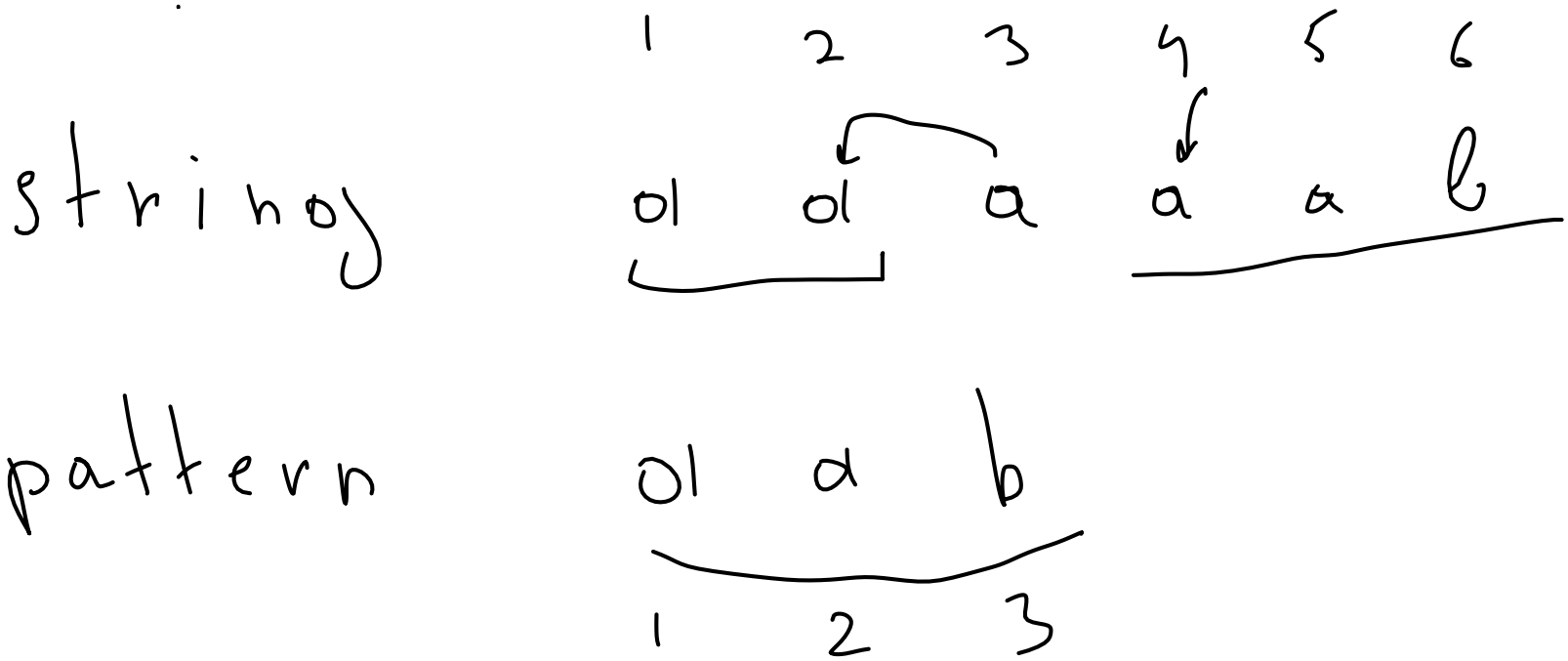
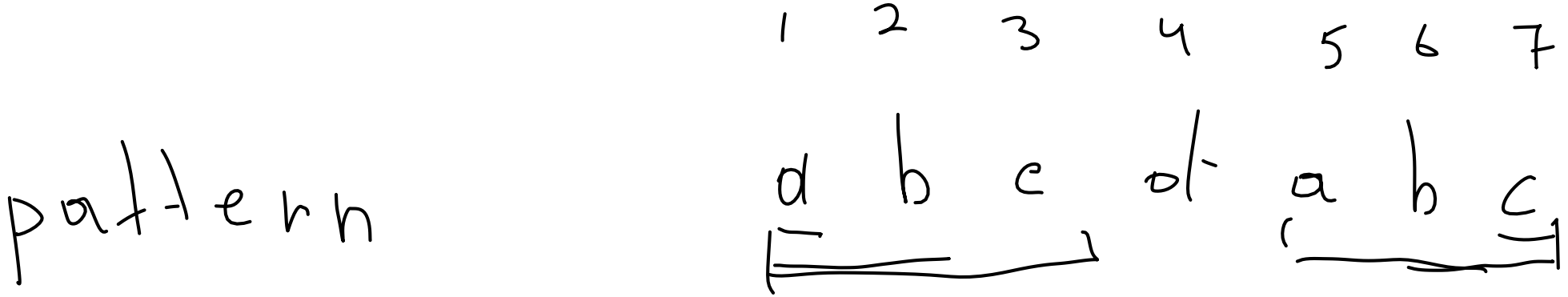
Knuth : Morris Pratt

	1	2	3	4	5	6	7	8	9
string	a	b	c	a	a	b	c	d	g
pattern →	a	b	c	a	g				
	1	2	3	4	5				


1 2 3 4 5 6
string
a a a a a b
pattern
a a b
1 2 3



prefixes : d, ab, abc, abcd, abcda,

suffixes : c, bc, abc, dabc, cdabc,

longest prefix suffix

lps — Prefix function

s: a b c d a b c a b f

0 0 0 0 1 2 3 1 2 0

a b c d

prefixes: a, ab, abc, abcd

suffixes:

S, a b c d c a b f a b c

→ 0 0 0 0 0 1 2 0 1 2 3

Prefix function

$$len(string) >> len(pattern)$$

$$n > m^2$$

i

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

String a b a b c a b c a b a b a b d

0 1 2 3 4 5

pattern

a	b	a	b	a
0	0	1	2	0

j

1) Compute Prefix function for pattern

2) $O(n + m^2)$

- Rabin-Karp
- KMP
- Naive