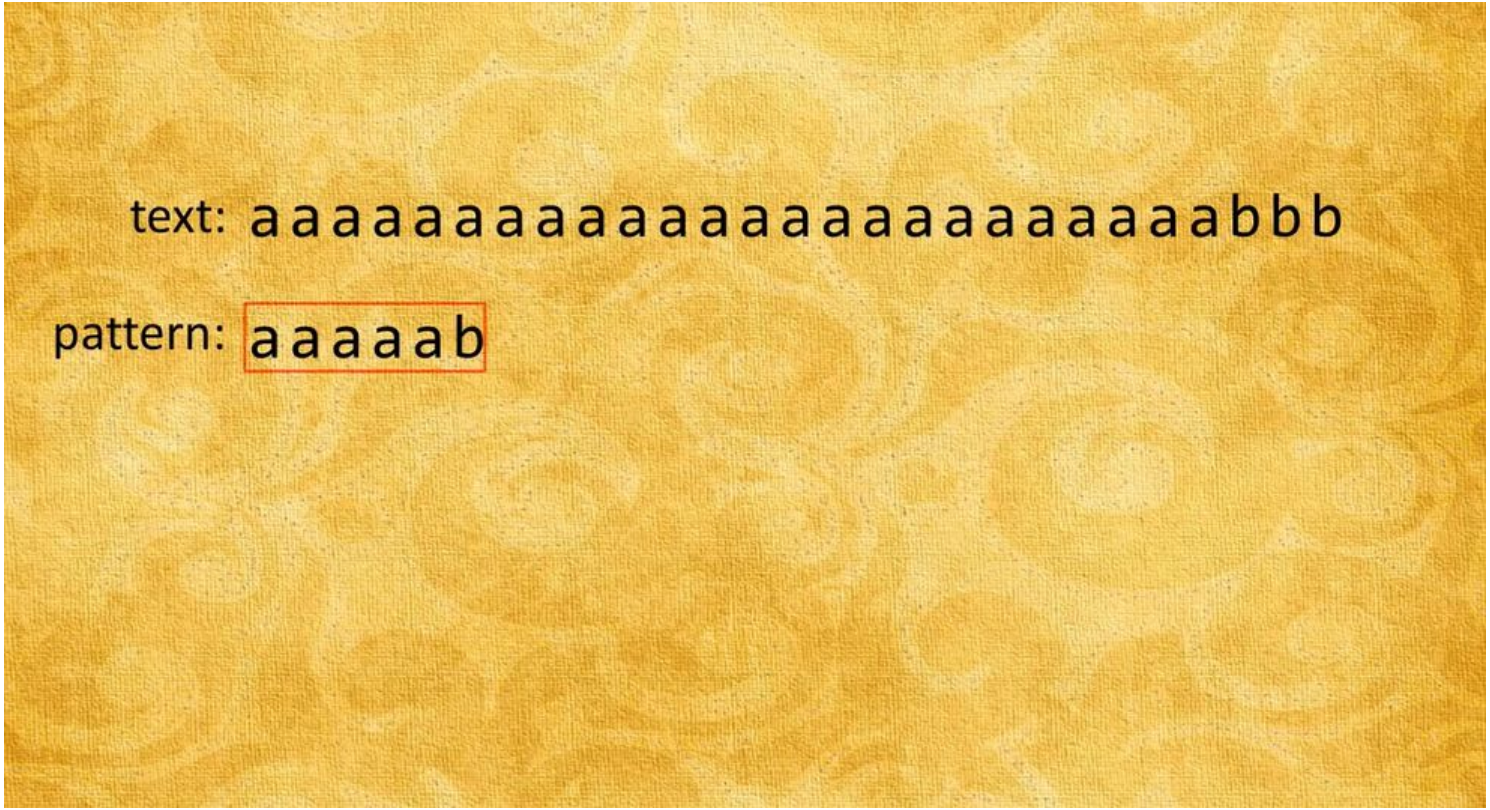
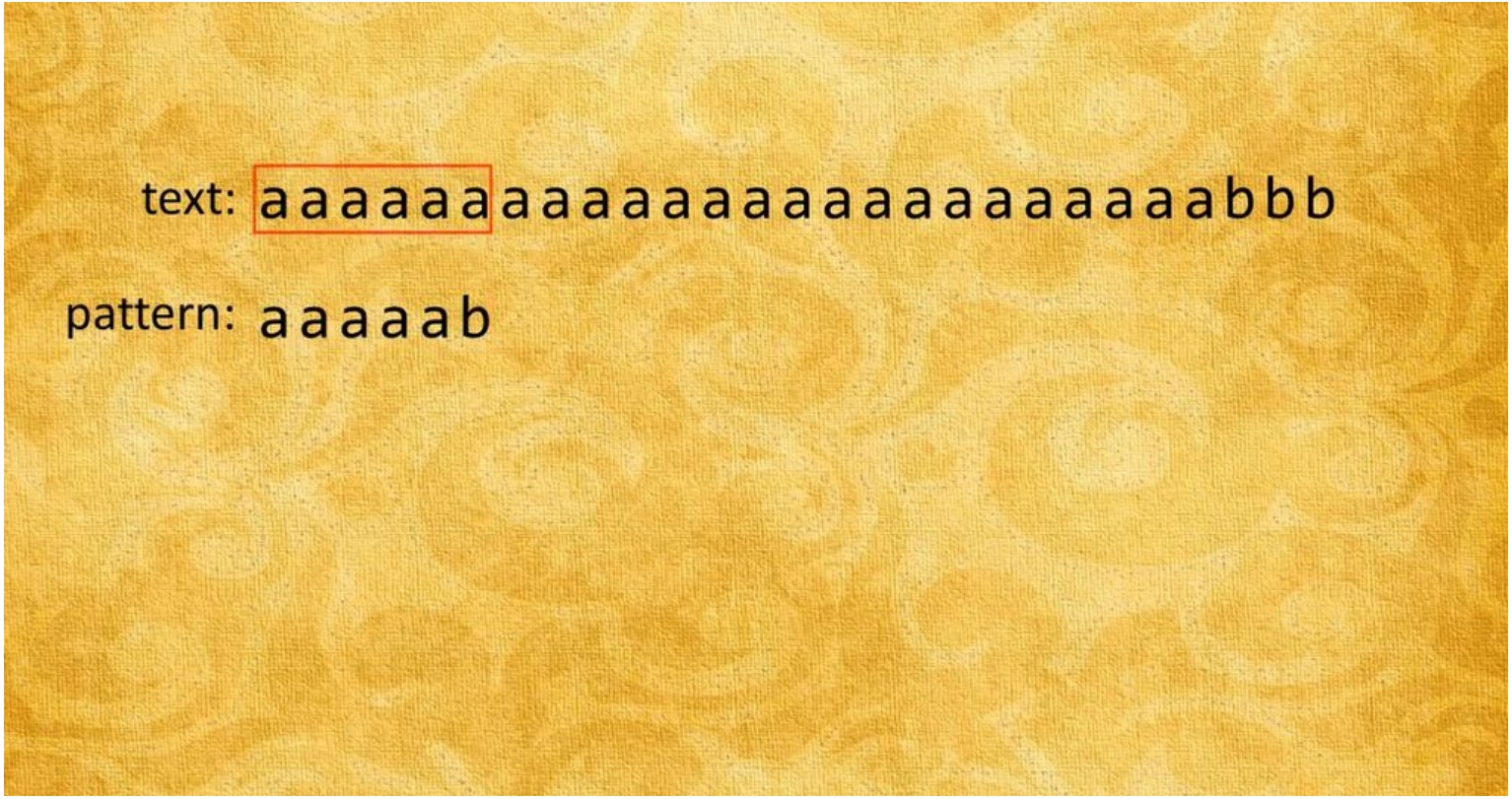
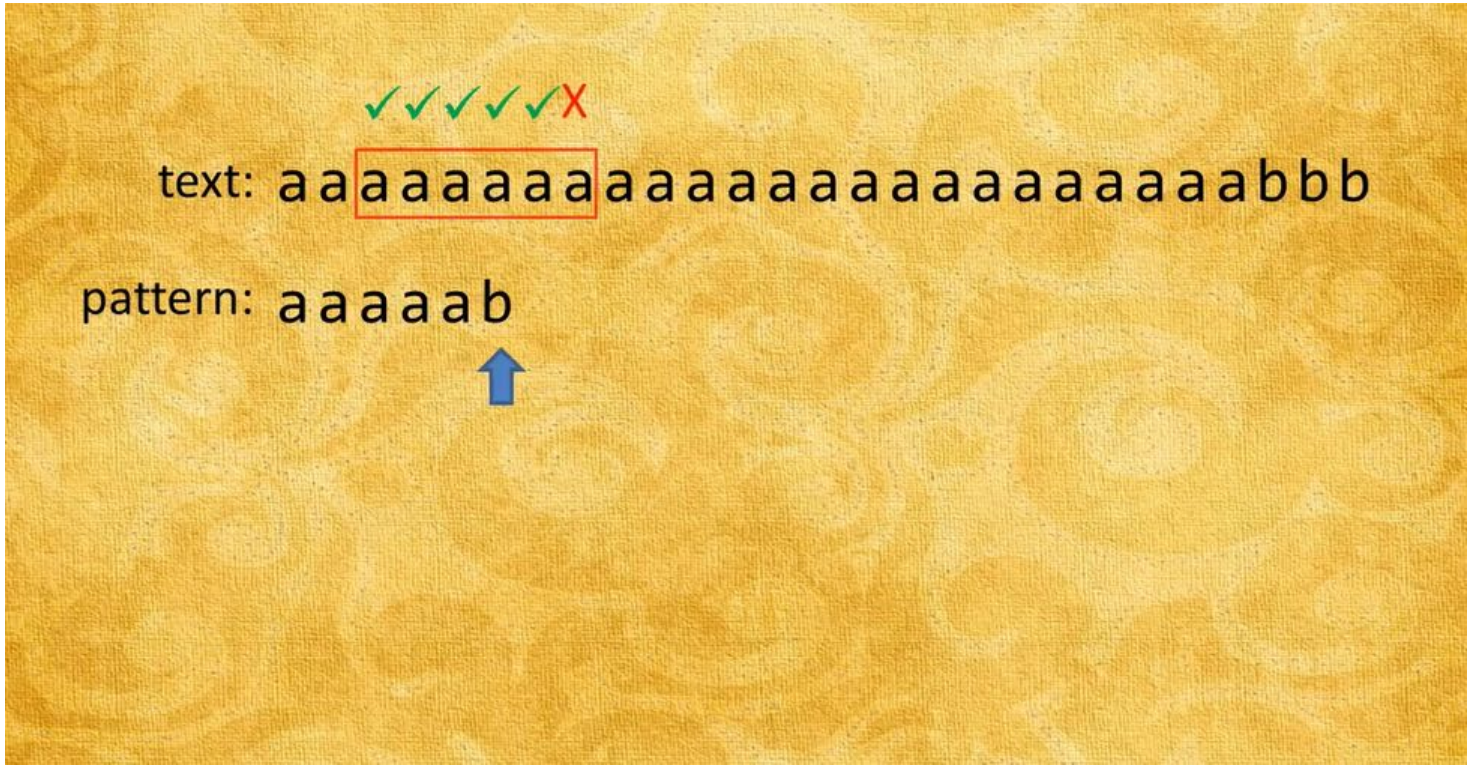
RABIN – KARP ALGORITHM


text: a a a a a a a a a a a a a a a a a a a a a a a a a a a b b b
pattern: a a a a a b


text: aaaaaaaaaaaaaaaaaaaaaaaaaaaabbb
pattern: aaaaab

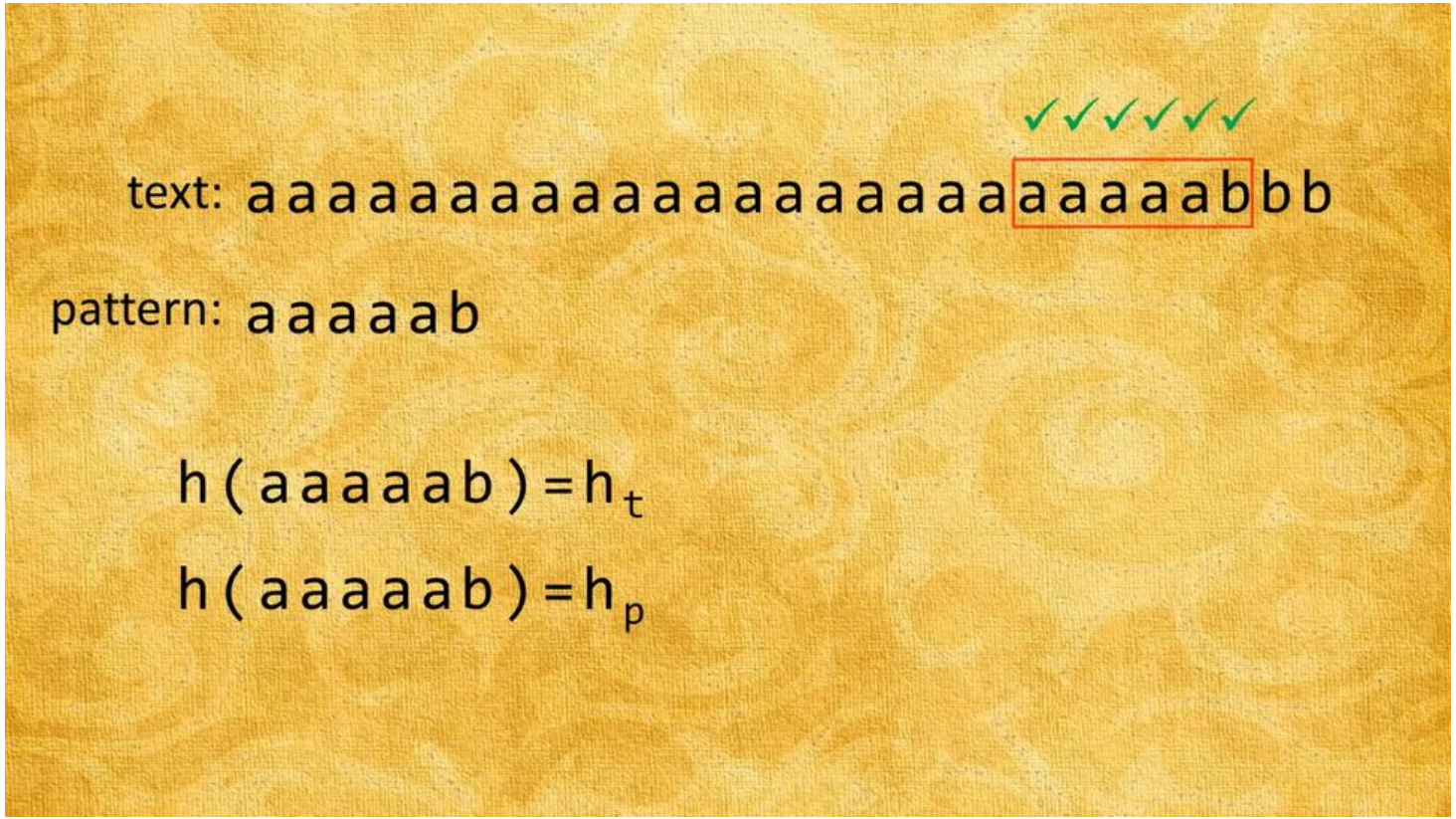

✓✓✓✓✓X
text: a a a a a a a a a a a a a a a a a a a a a a a a a a b b b
pattern: a a a a a b

text: aaaaaaaaaaaaaaaaaaaaaaaaaaabbb

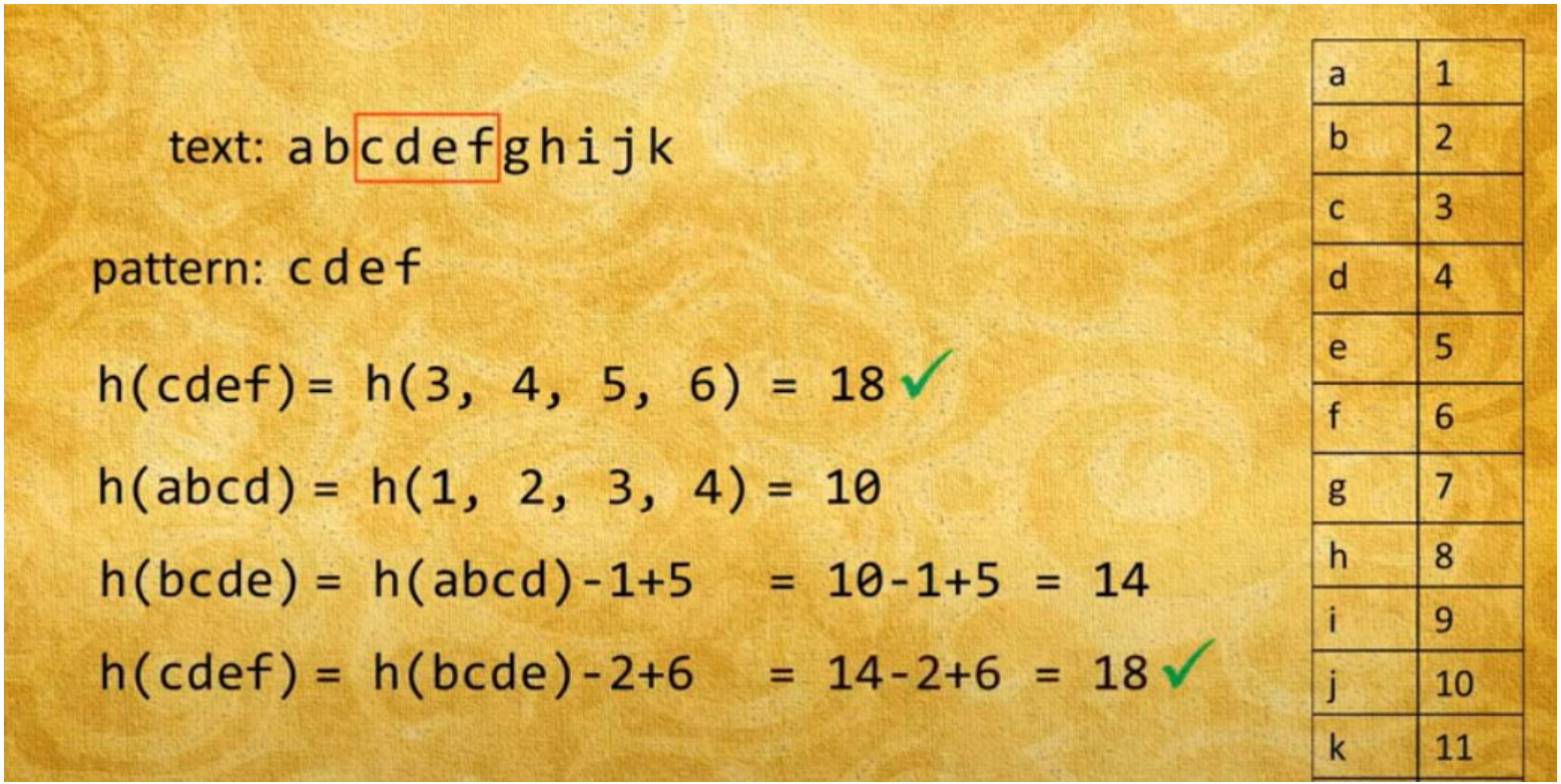
pattern: aaaaaab

$h(aaaaaa) = h_t$

$h(aaaaab) = h_p$


✓✓✓✓✓✓
text: a a a a a a a a a a a a a a a a a a a a a a a a a a a a a a b b
pattern: a a a a a b
h (a a a a a b) = h t
h (a a a a a b) = h p

Lay man approach to generate hash function……



Demerits : same value can be generated for different values/permutations.

text: abcdefghijk

multiplier: 10^{n-1} where n is the character position from the right

$$h(abcd) = h(1, 2, 3, 4)$$

$$= 1*10^3 + 2*10^2 + 3*10^1 + 4*10^0$$

$$= 1000 + 200 + 30 + 4 = 1234$$

a	1
b	2
c	3
d	4
e	5
f	6
g	7
h	8
i	9
j	10
k	11
...	

text: a b c d e f g h i j k

multiplier: 10^{n-1} where n is the character position from the right

$$h(abcd) = h(1, 2, 3, 4)$$
$$= 1*10^3 + 2*10^2 + 3*10^1 + 4*10^0$$
$$= 1000 + 200 + 30 + 4 = 1234$$

$$h(bcde) = (h(abcd) - 1*10^3) * 10 + 5$$
$$= (1234 - 1000) * 10 + 5 = 2345$$

$$h(cdef) = (h(bcde) - 2*10^3) * 10 + 6$$
$$= (2345 - 2000) * 10 + 6 = 3456$$

a	1
b	2
c	3
d	4
e	5
f	6
g	7
h	8
i	9
j	10
k	11
...	

text: abcdefghijk

$$h(abcd) = (1*10^3 + 2*10^2 + 3*10^1 + 4*10^0) \bmod 113$$
$$= (1234) \bmod 113 = 104$$

$$h(bcde) = (((h(abcd) - 1*10^3 \bmod 113)*10) \bmod 113 + 5) \bmod 113$$
$$= (((104 - 96)*10) \bmod 113 + 5) \bmod 113$$
$$= (80 \bmod 113 + 5) \bmod 113 = 85$$

Sanity check: (2000 + 300 + 40 + 5) mod 113 = 85

Code attached in a file in cc website