Class 11

Wednesday, October 20, 2021 8:58 PM

d_1 d_1 d_2 d_3 d_3 d_3

$d_1 \rightarrow 2$

$d_2 \rightarrow 1$

$d_3 \rightarrow 3$

$d_4 \rightarrow 7$

Exponial

n, M

$5, 17$

$n^{n-1} \% M$

$5^{4^{3^{2^{1}}}} \% 17$

$5^{262144} \% 17$

$5^{0} \% 17$

$\phi(17) = 16$

$f(n) = n^{f(n-1) \% m}$

$= \left(n^{\phi(m) + f(n-1) \% \phi(m)}\right) \% m$

mod-expo (a, b) → mod-expo$(n, \phi(m) + f(n-1) \% \phi(m)) \% m$

Hashing

String hashing

String hashing

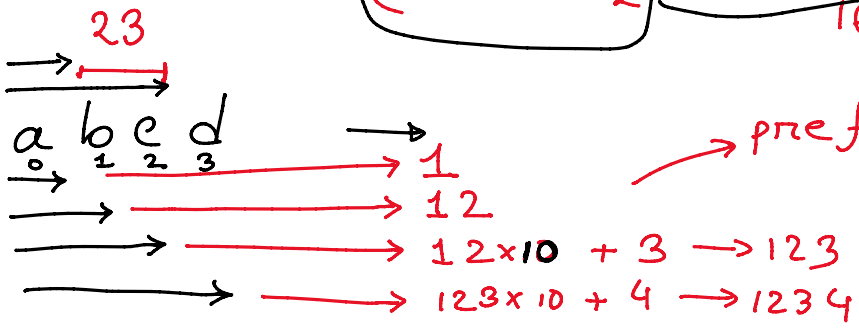
$(abcd)_{26} \rightarrow 1\times26^3 + 2\times26^2 + 3\times26^1 + 4\times26^0$

1 2 3 4

$\rightarrow (19010)_{10}$

$(10110)_2 \rightarrow 1\times2^4 + 0\times2^3 + 1\times2^2 + 1\times2^1 + 0\times2^0$

$16 + 0 + 4 + 2 + 0 \rightarrow (22)_{10}$



prefix hash values

R-L+1

abc → 123

a → 100

(-)

23

hash [1, 2] → 23

~~hash~~ prefix hash[2] − (prefix hash[0] × 10^2)

123 − (1 × 10^2) = 23

pH[R] − (pH[L-1] × B^{R-L+1})

[a b c] d

$(a-b)\%M \rightarrow (a\%M - b\%M + M)\%M$

$(17-14)\%15 \rightarrow (2-14)\%15$

$(-12+15)\%15 \rightarrow 3\%15$

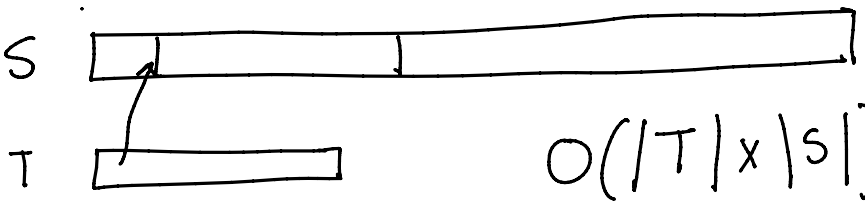
-12, 3, 18, 33, ... equal

$3\%15 = 18\%15 = 33\%15$

—o—

P1 Pattern matching

S, T

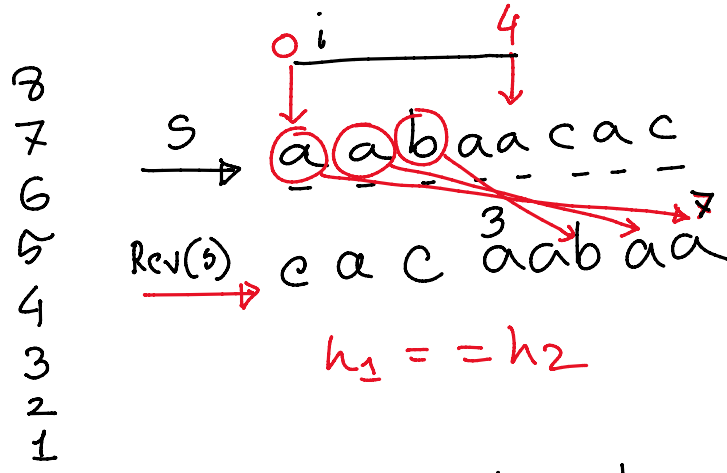


$O(|T| \times |S|) \simeq N^2$

$(L-1) - i$ $\quad 0 \to 7$, $4 \to 3$ $\quad O(|S|)$

—o—

P2 S → find out the number of palindromic substring



$h_1 == h_2$

$n^2 \simeq \frac{n(n+1)}{2}$

n = 5000

$O(n) \times n^2 \to n^3$

1 + 7 = 7
1 + 6 = 7
2 + 5 = 7

7 - 0

a b a b a b

S → a x a a b a a b a a b z z

T → a a b