Longest Prefix Suffix

KMP

PQRSTPQRS

= 4

Prefix	Suffix
P	S
PQ	RS
PQR	QRS
PQRS ✓	4 ✓ PQRS
PQRST	TPQRS
PQRSTP	STPQRS
PQRSTPQ	RSTPQRS
PQRSTPQR	QRSTPQRS

$O(N^2)$

$O(N^2)$

Comparison $O(N^2)$

S.C = ?

length = 4

T.C = $O(N^2)$

$S_1 =$ P Q R S T (n)

$S_2 =$ Q R S T U (m)

0

if ($S_1 == S_2$)

T.C = ?

O(min(n,m))

O(n+m)

O(n)

$S_3 =$ P P P P P P (n)

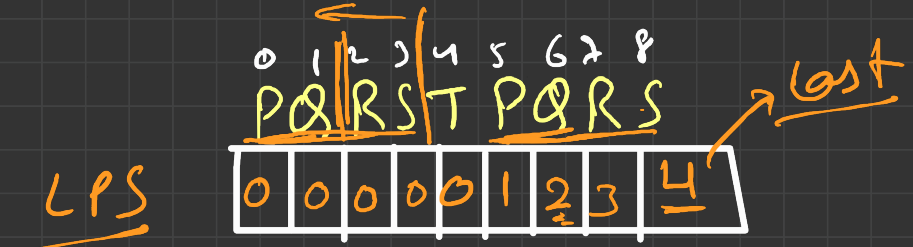
$S_4 =$ P P P P (m)

0

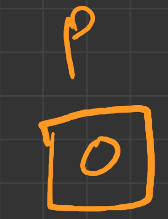
min (n+m)

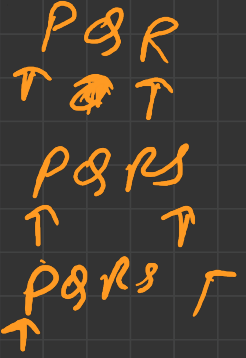
Stop

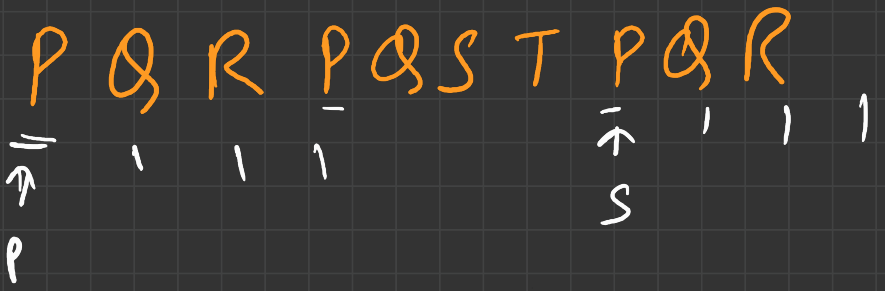
PQRSTPQRS

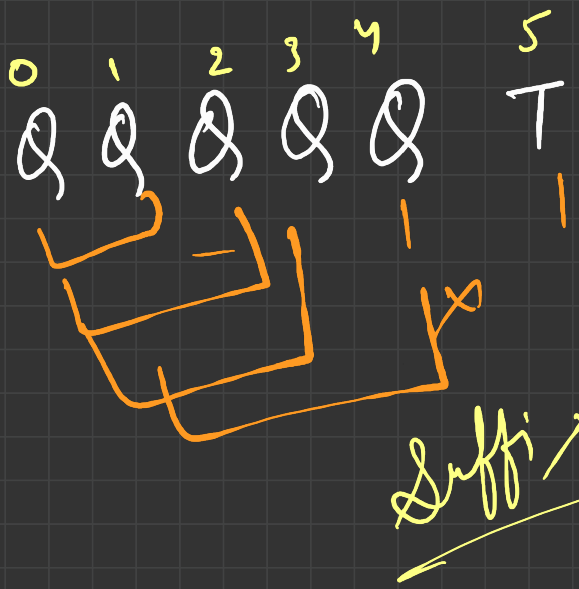


PQRSTPQRS



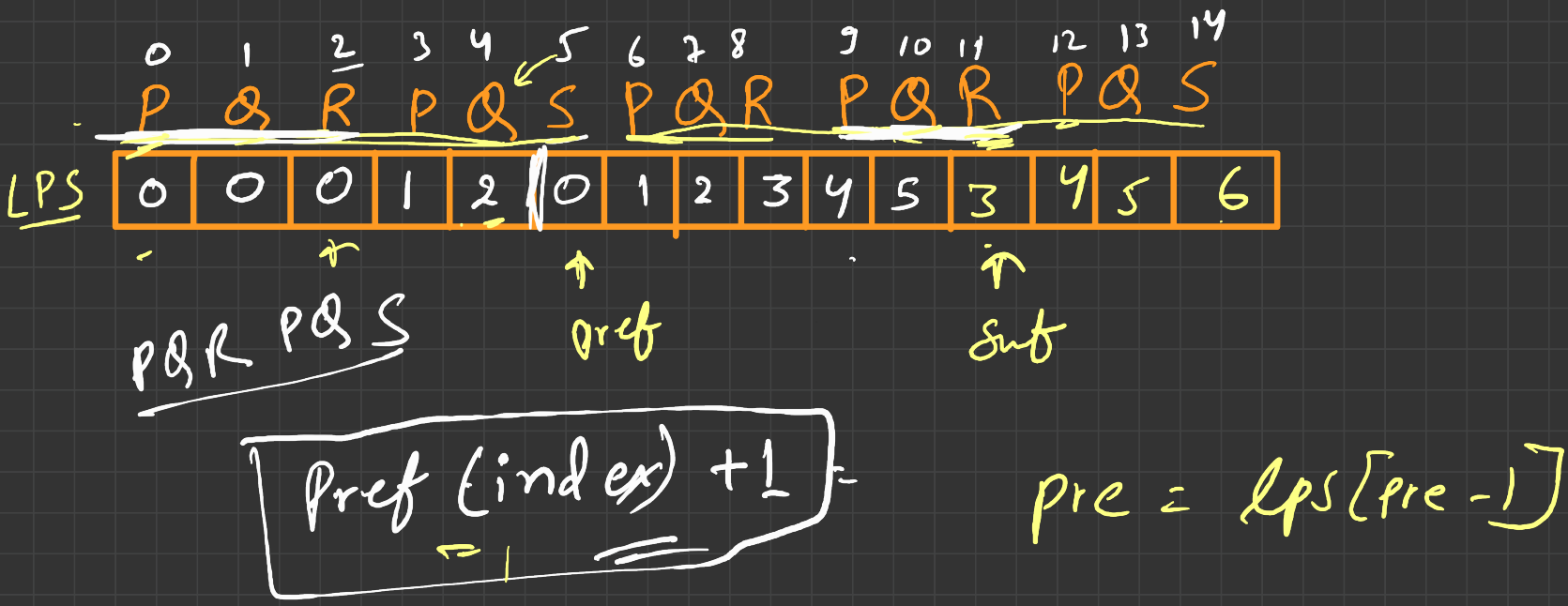






$O(N^2)$

1, 2, 3, 4



Pref (index) +1

pre = lps[pre - 1]

```
vector<int> lps(s.size(), 0)
int pre = 0, suf = 1;
while (suf < s.size()) {
    if (s[pre] == s[suf]) {
        lps[suf] = pre + 1
        pre++, suf++;
    }
```

- 1

```
else {
    if (pre == 0) {
        lps[suf] = 0;
        suf++;
    }
    else {
        pre = lps[pre - 1];
    }
}
return (lps[s.size() - 1]);
```