PATTERN MATCHING BASICS

→ first discussing the Most Naive approach.

s → b c a d c b c d

p → b c d

```
for(i=0; i<=len(s)-len(p); i++){
    for(j=0; j<len(p); j++){
        if(p[j] == s[i+j])
            continue;
        bool isfound=true;
    }
}
```

Time Complexity : O(n*m)

KMP ALGORITHM ≃ O(n)

- Time Complexity : O(string length) + O(Pattern length)
- we need a prefix which is also a suffix.

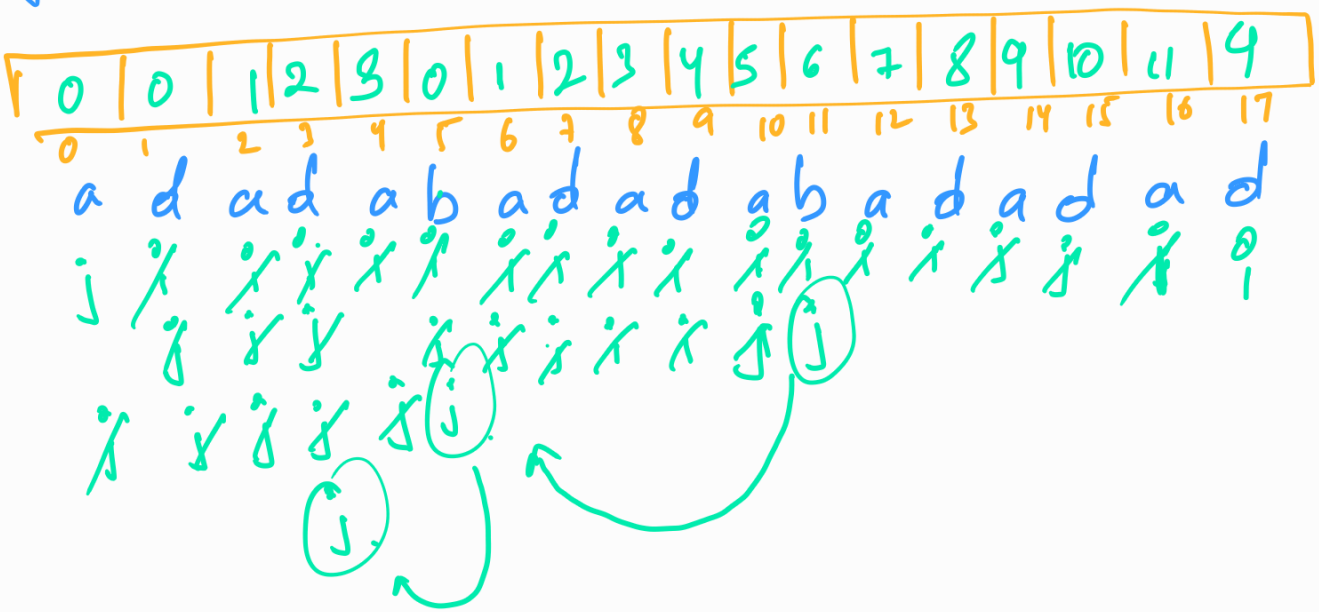
S : a b c z a b c g a b z a b c g a b c g a b c y

P : a b c g a b c y

LONGEST PREFIX SUFFIX EXPLAIN

eg -

works in O(n)



Z- ALGORITHM PATTERN MATCHING

z - function → z(k) → length of longest substring starting at k which is also the prefix of the string.

Time Complexity for z-array is O(m+n).

z-array

a a c b y a a k a a c

0 1 0 0 0 2 1 0 3 1 0

Now,

text = y a b c k a b d a b c

Pattern = a b c

we will generate,

Pattern + '$' + Text

= a b c $ y a b c k a b d a b c

0 0 0 0 0 3 0 0 0 2 0 0 3 0 0

↑ 1 - p.length() - 1