Q Given an array of strings.

Find the longest string which is a prefix of all the strings in the array.

Eg: [ "axdc" , " axbc", "axdb"] = N

Ans = ax

O(N × length of string)

max

T.C. = O(N × min string length)

---

Q Boring string. ⇒ 1) Length = 2

2) If ASCII value of 1st char is $x$

ASCII value of 2nd char can be $x+1$ or $x-1$

__ __

c ⇓ 99

100 / 98

d b

c d

c b

x y ✓

y x ✓

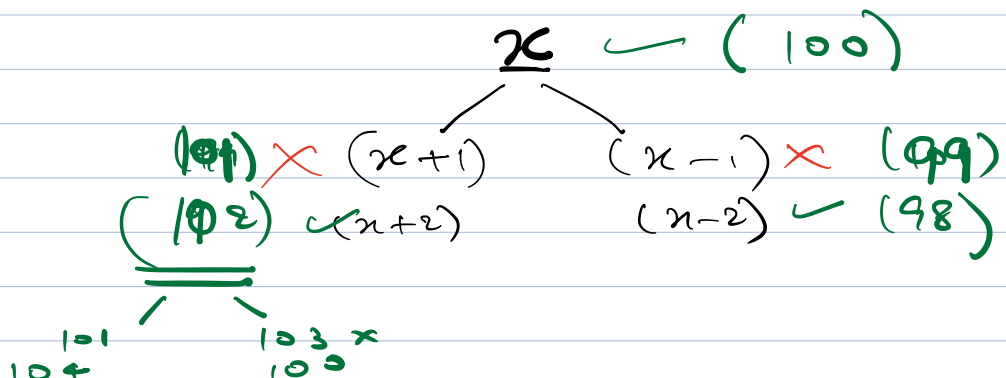
b d ✗

98 100

Given a string s.

Rearrange the characters s.t. there is no boring substring present.

Eg: "abcd" ⇒ cadb ✓
acbd ✗
bdac ✓




s = "aebcfghdbc"

Even ASCII value ⇒ b, d, f, h...

Odd ASCII value ⇒ a, c, e, g....

s = "aebcfghdbc" N

min N/2 odd Even N/2

max

a, e, c, g, c ← Concatenate → b, f, h, d, b

13 13 min / max

Q Find 2 corner characters.

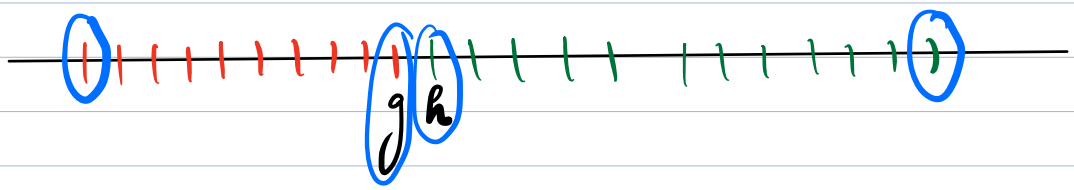
Brute force

aecg[b]fhdd

$O\left(\frac{N}{2} \times \frac{N}{2}\right) = O(N^2)$

Red odd

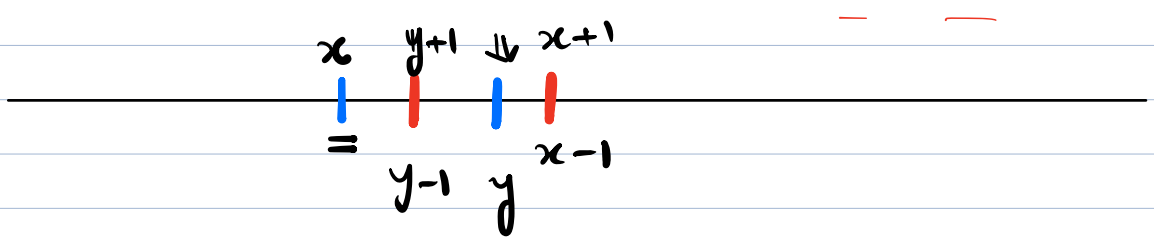
Green Even




1) Max of Odd & Min of Even

or

2) Min of Odd & Max of Even



T.C. = O(N)

S.C. = O(N) ⇒ constant

---

Q) Given a string S of size N.

= Find the smallest period of the string.

If the period of a string is K, then,

$$S[i] = S[i \,\%\, K] \quad \forall i.$$

Eg: a b c a | a b c a | a b c a

0 1 2 3 | 4 5 6 7 | 8 9 10 11

0 1 2 3 | 0 1 2 3 | 0 1 2 3

1 2 3 S[i] = S[i % K] ∀i

4 5 . . ---

K = 4

aaaaaaa

Soln

① Brute force

```
for (K = 1; K <= N; K++) {
    boolean isTrue = True;
    for (i = 0; i < N; i++) {
        if (S[i] != S[i % K]) {
```

```
        }
        if (isTrue) {
            return k;
        }
    }
```

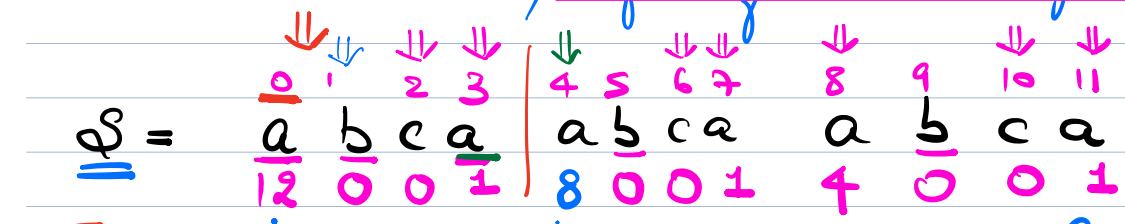
T.C. = $O(N^2)$

## (2) Optimised

### Z Algo

Z array of size N

Z[i] ⇒ length of the longest substring starting at i which is also a prefix of the string S(0)

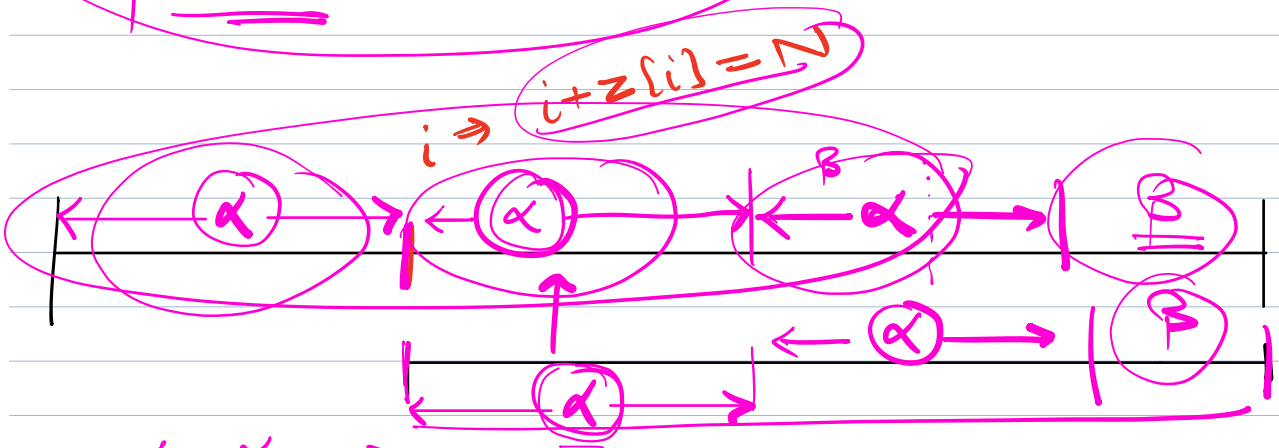


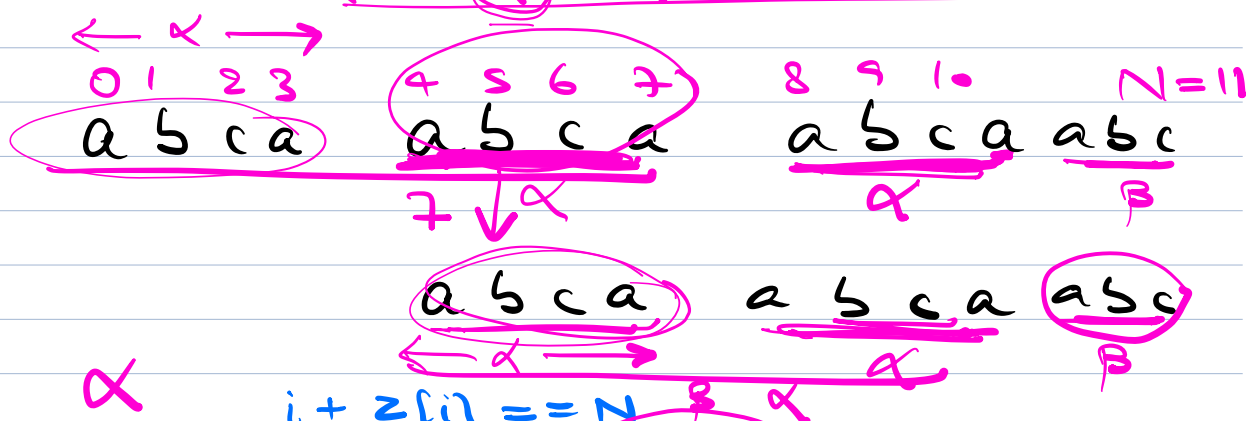

a, ab
abc, abca
abcaa, abcaab
abcaabc
abcaabca

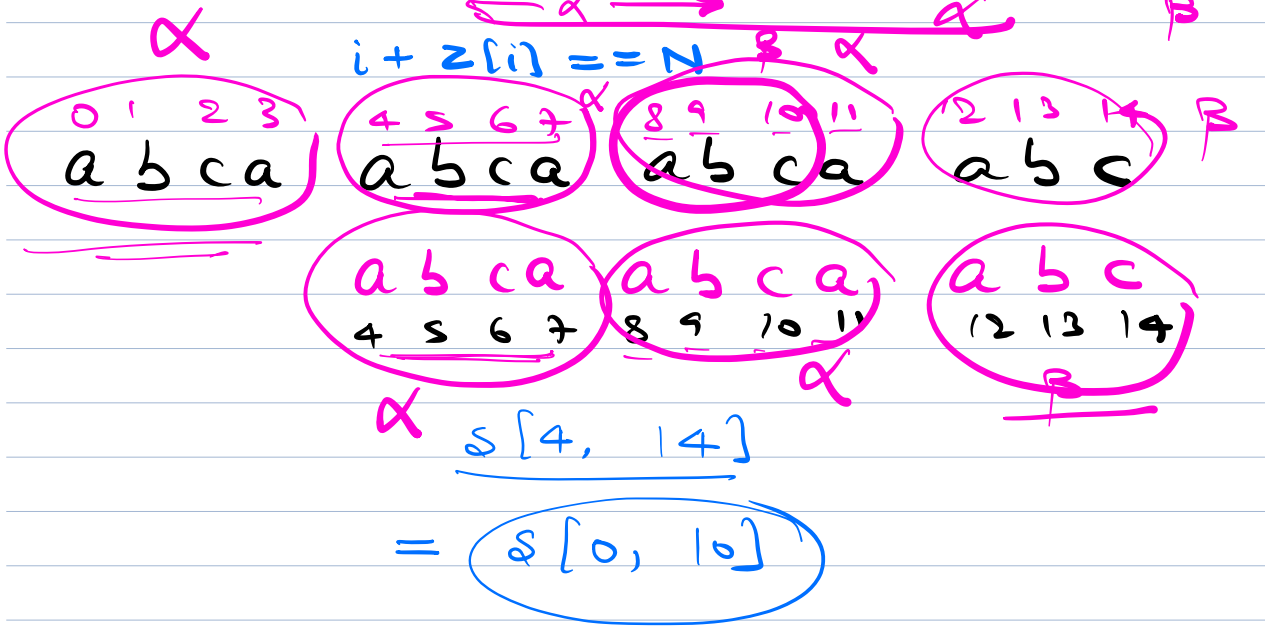
(1)

(i) ⇒ i + Z[i] = N

Period




$s[4, 14] = s[0, 10]$

H.W.

How to find Z array ??