String Matching

1) Naive Approach

* Text String $T = T[1, 2, \ldots n]$
* Pattern $P = P[1, 2, \ldots m]$

$m << n$

Maximum times P is in T = $n - m + 1$

(1) $n = |T|$ and $m = |P|$

(2) FOR $s \leftarrow 0$ to $n - m$ ▷ Shifting of P in T

```
    FOR i ← 1 to m
    |   if ( P[i] ≠ T[s+i])
    |   |     BREAK
    |
    if ( i = m+1)
        RETURN s    ▷ s shifting is required
RETURN n            ▷ No matching
```

Time Complexity

(i) **Best Case** T = A B A C D A E G F

P = A B A C

Time Complexity = O(m)

(ii) **Worst Case**

T = A A A A A A A A A A A B

P = A A A B X

A A A B X

A A A B X

A A A B X

A A A B X

A A A B X

A A A B X

A A A B X

A A A B X

A A A B ✓

Time Complexity = (n − m + 1) m