

The Naive String Matching Algorithm

The naïve approach tests all the possible placement of Pattern P [1.....m] relative to text T [1.....n]. We try shift $s = 0, 1, \dots, n-m$, successively and for each shift s . Compare T [s+1.....s+m] to P [1.....m].

The naïve algorithm finds all valid shifts using a loop that checks the condition $P [1.....m] = T [s+1.....s+m]$ for each of the $n - m + 1$ possible value of s .

NAIVE-STRING-MATCHER (T, P)

1. $n \leftarrow \text{length } [T]$
2. $m \leftarrow \text{length } [P]$
3. for $s \leftarrow 0$ to $n - m$
4. do if $P [1.....m] = T [s + 1.....s + m]$
5. then print "Pattern occurs with shift" s

Analysis: This for loop from 3 to 5 executes for $n-m + 1$ (we need at least m characters at the end) times and in iteration we are doing m comparisons. So the total complexity is $O(n-m+1)$.

Example:

1. Suppose $T = 1011101110$
2. $P = 111$
3. Find all the Valid Shift

T = Text



$S=0$



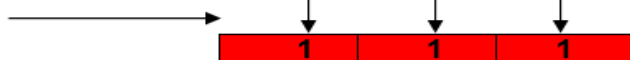
P = Pattern



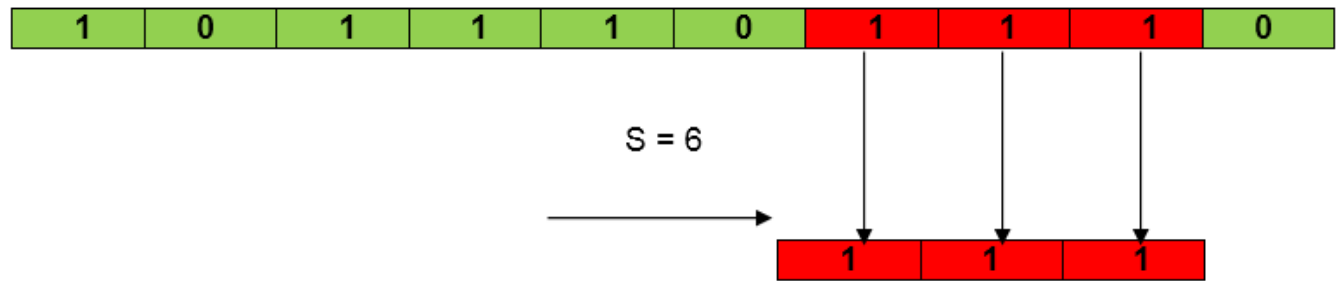
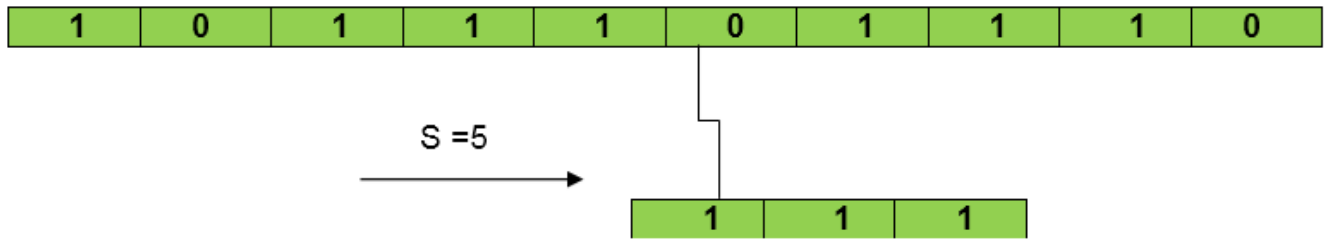
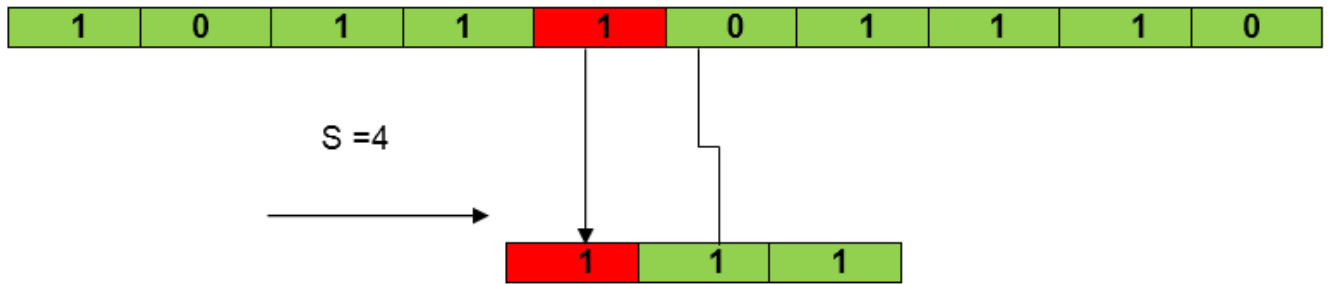
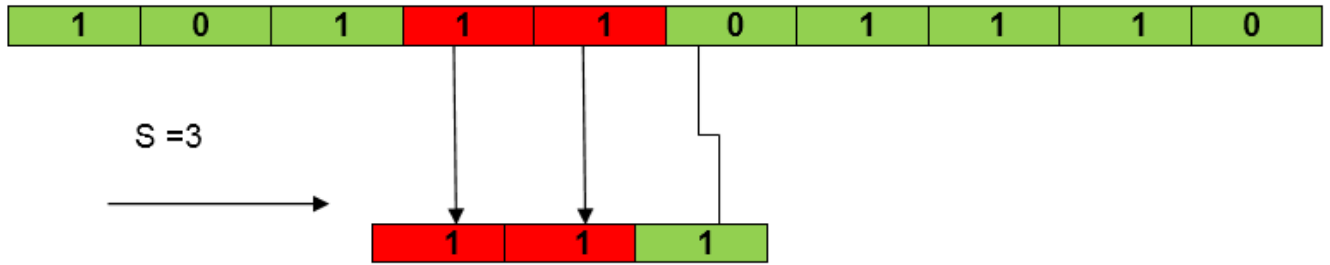
$S=1$



$S=2$



So, S=2 is a Valid Shift



So, S=6 is a Valid Shift

