

* Turing machine can represent Recursive

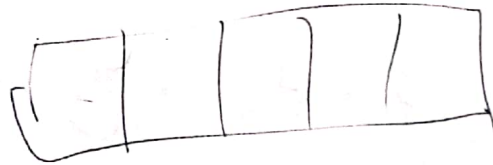
17 Enumerative Language

Algo

13.12.22

KMP — substring match
— $O(m+n)$
— linear search algo

* LPS — longest prefix suffix



* $i=0, j=1, \text{lps}[0]=0;$

→ $\text{pat}[i] = \text{pat}[j]$

$\text{lps}[j] = i+1$

$i++, j++;$

→ $\text{pat}[i] \neq \text{pat}[j];$

if $i=0$ $\text{lps}[j]=0;$

$i = \text{lps}[i-1]$

$j++;$ ~~$i++;$~~

i
 \nwarrow text: $\begin{matrix} 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 & 11 & 12 & 13 & 14 & 15 & 16 \\ a & b & a & b & c & a & b & a & b & a & b & a & b & a & b & a & b & d \end{matrix}$
 \swarrow pat: $\begin{matrix} a & b & a & b & d \\ 0 & 1 & 2 & 3 & 4 \end{matrix}$
 j

if match $i++$, $j++$.

if !match $j = \text{len}(\text{pat}) - 1$

* $j = 0$, $j++$

Step

$i = 0, j = 0$	✓	11, 3	✓
$i = 1, j = 1$	✓	12, 4	✗
$i = 2, j = 2$	✓	12, 2	✓
$i = 3, j = 3$	✓	13, 3	✓
$i = 4, j = 4$	✗	14, 4	✗
$i = 4, j = 2$	✗	14, 2	✓
$i = 4, j = 0$	✓	15, 3	✓
$i = 5, j = 0$	✓	16, 4	✓
$i = 6, j = 1$	✓		
7	2	✗	
7	0	✓	
8	0	✓	
10	2	✓	