

1 Prefix Function

Algorithm 1 PREFIX-FUNCTION

Input: A pattern $P[1, 2, \dots, m]$

Output: Prefix function for the pattern P

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1:  $m \leftarrow |P|$  ▷ Length of the pattern  $P$ 
2:  $\pi[1, 2, \dots, m] \leftarrow \emptyset$  ▷ An array to store the value of the prefix function for the pattern  $P$ 
3: for  $i \leftarrow 1$  to  $m$  do
4:    $\pi[i] \leftarrow 0$ 
5: end for
6: for  $i \leftarrow 1$  to  $m$  do
7:   for  $j \leftarrow 1$  to  $i - 1$  do ▷ Explore all proper prefix/suffix of pattern  $P[1, 2, \dots, i]$ 
     from length 1 to  $i - 1$ 
8:     if  $\underbrace{P[1, 2, \dots, j]}_{\text{Proper prefix}} = \underbrace{P[i - j + 1, i - j + 2, \dots, j]}_{\text{Proper suffix}}$  then
9:        $\pi[i] \leftarrow j$ 
10:    end if
11:  end for
12: end for
13: return  $\pi$ 
```
