The KMP Algorithm (contd.)

• The KMP failure function: Pseudo-Code

Algorithm KMPFailureFunction(P);
  Input: String P (pattern) with m characters
  Ouput: The faliure function f for P, which maps j to
    the length of the longest prefix of P that is a suffix
    of $P[1,..,j]$

  $i \leftarrow 1$
  $j \leftarrow 0$
  while $i \leq m$-1 do
    if $P[j] = P[i]$ then
        {we have matched $j + 1$ characters}
        $f(i) \leftarrow j + 1$
        $i \leftarrow i + 1$
        $j \leftarrow j + 1$
    else if $j > 0$ then
        {j indexes just after a prefix of P that matches}
        $j \leftarrow f(j$-1$)$
    else
        {there is no match}
        $f(i) \leftarrow 0$
        $i \leftarrow i + 1$