The KMP Algorithm (contd.)

• The KMP failure function: Pseudo-Code

Algorithm KMPFailureFunction(P);
Input: String P (pattern) with m characters
Output: The failure 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\}
    \(f(i) \leftarrow 0\)
    \(i \leftarrow i + 1\)