























Computing the Failure **Function** The failure function can be represented by an array and Algorithm failure Function(P) gorithm failure Function (P) $F[0] \leftarrow 0$ $i \leftarrow 1$ $j \leftarrow 0$ while i < mif P[I] = P[j]{we have matched j + 1 chars} $F[I] \leftarrow j + 1$ $i \leftarrow i + 1$ $j \leftarrow j + 1$ else if j > 0 then
{use failure function to shift P} $j \leftarrow F[j - 1]$ else can be computed in O(m) time • The construction is similar to the KMP algorithm itself At each iteration of the whileloop, either • *i* increases by one, or • the shift amount i-jincreases by at least one (observe that F(j-1) < j) Hence, there are no more than 2m iterations of the $F[i] \leftarrow 0 \text{ (no match)}$ $i \leftarrow i + 1$ while-loop Pattern Matching 13

