
Algorithm 2: *bidir-search*(affix-interval $v = \langle k, \ell - [i..j], X \rangle$, pos r , pos r')

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1 if  $r < 0$  and  $r' \geq m$  then
2   | report match at positions  $\text{suf}_X[i] + k, \dots, \text{suf}_X[j] + k$ 
3   | return
4 else if  $r \geq 0$  and  $r' < m$  and  $R[r] = '('$  and  $R[r'] = ')'$  then
5   | if  $X = R$  then
6   |   | // perform left extension first
7   |   | foreach  $v'$  such that  $d \in \varphi(P[r])$  and  $\vec{v}' = d\vec{v}$  do
8   |   |   | foreach  $v''$  such that  $e \in \varphi(P[r'])$  and  $(d, e)$  complementary and  $\vec{v}'' = \vec{v}'e$  do
9   |   |   |   | bidir-search( $v'', r - 1, r' + 1$ )
10  |   |   | end
11  |   | end
12 else
13  |   | // perform right extension first
14  |   | foreach  $v'$  such that  $e \in \varphi(P[r'])$  and  $\vec{v}' = \vec{v}e$  do
15  |   |   | foreach  $v''$  such that  $d \in \varphi(P[r])$  and  $(d, e)$  complementary and  $\vec{v}'' = d\vec{v}'$  do
16  |   |   |   | bidir-search( $v'', r - 1, r' + 1$ )
17  |   |   | end
18  |   | end
19 else if  $r' < m$  and  $R[r'] = '.'$  and  $(X = F$  or  $r < 0$  or  $R[r] \neq '('$ ) then
20  | foreach  $v'$  such that  $d \in \varphi(P[r'])$  and  $\vec{v}' = \vec{v}d$  do
21  |   | bidir-search( $v', r, r' + 1$ )
22  | end
23 else if  $r \geq 0$  and  $R[r] = '.'$  then
24  | foreach  $v'$  such that  $d \in \varphi(P[r])$  and  $\vec{v}' = d\vec{v}$  do
25  |   | bidir-search( $v', r - 1, r'$ )
26  | end
27 end

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