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Input: sequences  $X, Y, Z$ 
pushdown stack coordinateStack;          /* hold (state, subsequence triplet) pairs */
 $a \leftarrow \text{Start};$                       /* current ensemble state */
 $n^{(X)} \leftarrow N^{(X)};$           /* current  $X$  subsequence;  $N^{(X)}$  is the outermost subsequence */
 $n^{(Y)} \leftarrow N^{(Y)};$           /* current  $Y$  subsequence;  $N^{(Y)}$  is the outermost subsequence */
 $n^{(Z)} \leftarrow N^{(Z)};$           /* current  $Z$  subsequence;  $N^{(Z)}$  is the outermost subsequence */
clear coordinateStack;
begin main loop:
    output current state  $a$  and subsequence triplet  $(n^{(X)}, n^{(Y)}, n^{(Z)})$ ;
    if  $a$  is the End state then                      /* end of a parse subtree */
        if coordinateStack is empty then return ;          /* end of the parse tree */
        pop  $(a, n^{(X)}, n^{(Y)}, n^{(Z)})$  from coordinateStack ;
        goto main loop ;
    else if  $a$  is a bifurcation state then                /* bifurcation  $a \rightarrow cb$  */
        select  $(n_L^{(X)}, n_R^{(X)}) \in b_{in}(n^{(X)}), (n_L^{(Y)}, n_R^{(Y)}) \in b_{in}(n^{(Y)}), (n_L^{(Z)}, n_R^{(Z)}) \in b_{in}(n^{(Z)})$ 
        such that
         $\gamma_a(n^{(X)}, n^{(Y)}, n^{(Z)}) = \gamma_a(n_L^{(X)}, n_L^{(Y)}, n_L^{(Z)}) \gamma_a(n_R^{(X)}, n_R^{(Y)}, n_R^{(Z)})$  ;
        push  $(c, n_R^{(X)}, n_R^{(Y)}, n_R^{(Z)})$  onto coordinateStack ;
         $a \leftarrow b;$ 
         $n^{(X)} \leftarrow n_L^{(X)};$ 
         $n^{(Y)} \leftarrow n_L^{(Y)};$ 
         $n^{(Z)} \leftarrow n_L^{(Z)};$ 
        goto main loop ;
    else                      /* Emit or Null state */
         $m^{(X)} \leftarrow c_{in}(b; n^{(X)})$  ;
         $m^{(Y)} \leftarrow c_{in}(b; n^{(Y)})$  ;
         $m^{(Z)} \leftarrow c_{in}(b; n^{(Z)})$  ;
        select  $b \in \{b : \exists a \rightarrow lbr\}$ 
        such that
         $\gamma_a(n^{(X)}, n^{(Y)}, n^{(Z)}) = P(a \rightarrow lbr) \gamma_b(m^{(X)}, m^{(Y)}, m^{(Z)})$ ;
         $a \leftarrow b;$ 
         $n^{(X)} \leftarrow m^{(X)};$ 
         $n^{(Y)} \leftarrow m^{(Y)};$ 
         $n^{(Z)} \leftarrow m^{(Z)};$ 
        goto main loop ;
end

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