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