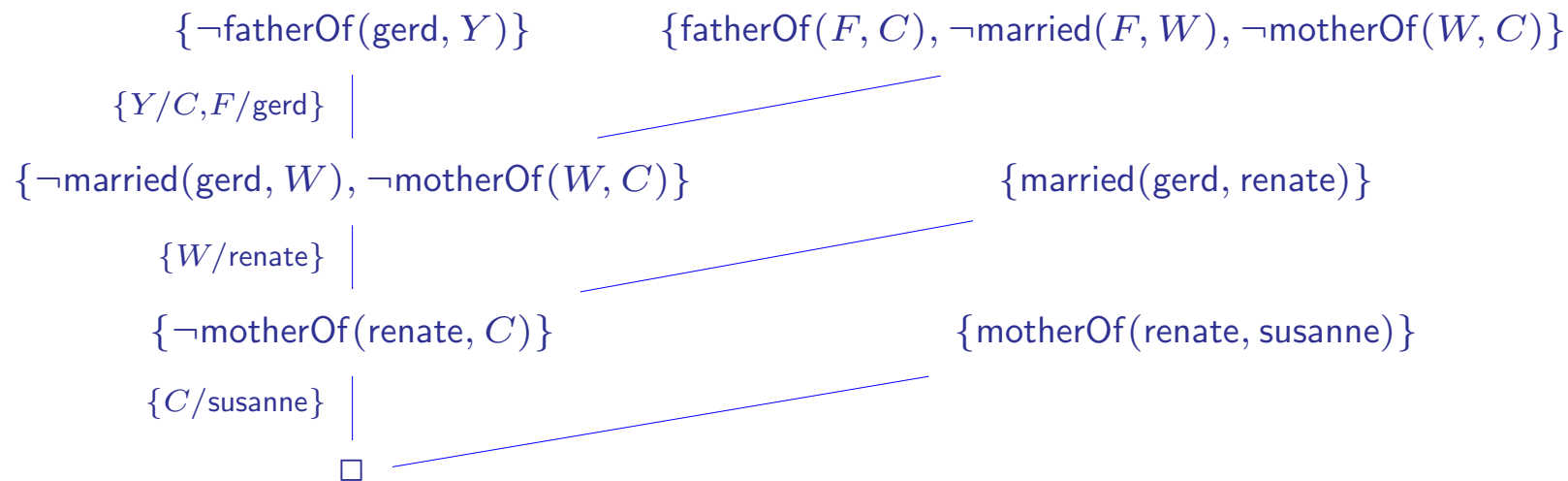


$$\mathcal{P} = \left\{ \begin{array}{l} \{\text{motherOf}(\text{renate}, \text{susanne})\}, \\ \{\text{married}(\text{gerd}, \text{renate})\}, \\ \{\text{fatherOf}(F, C), \neg\text{married}(F, W), \neg\text{motherOf}(W, C)\} \end{array} \right\}$$

$$G = \{\neg\text{fatherOf}(\text{gerd}, Y)\}$$



$$\{C/\text{susanne}\} \circ \{W/\text{renate}\} \circ \{Y/C, F/\text{gerd}\} = \{C/\text{susanne}, W/\text{renate}, Y/\text{susanne}, F/\text{gerd}\}$$

Let  $\mathcal{P}$  be a logic program, let  $G = \{\neg A_1, \dots, \neg A_k\}$  be a query.

$D[\mathcal{P}, G] = \{\sigma(A_1 \wedge \dots \wedge A_k) \mid \mathcal{P} \models \sigma(A_1 \wedge \dots \wedge A_k), \sigma \text{ is ground substitution}\}$

$P[\mathcal{P}, G] = \{\sigma'(A_1 \wedge \dots \wedge A_k) \text{ ground instance of } \sigma(A_1 \wedge \dots \wedge A_k) \mid (G, \emptyset) \vdash_{\mathcal{P}}^+ (\square, \sigma)\}$

There is a *computation step*  $(G_1, \sigma_1) \vdash_{\mathcal{P}} (G_2, \sigma_2)$  iff

- $G_1 = \{\neg A_1, \dots, \neg A_k\}$  with  $k \geq 1$
- there exists a  $K \in \mathcal{P}$  with  $\nu(K) = \{B, \neg C_1, \dots, \neg C_n\}$  such that
  - $G_1$  and  $\nu(K)$  have no common variables
  - $A_i$  and  $B$  are unifiable with mgu  $\sigma$
- $G_2 = \sigma(\{\neg A_1, \dots, \neg A_{i-1}, \neg C_1, \dots, \neg C_n, \neg A_{i+1}, \dots, \neg A_k\})$
- $\sigma_2 = \sigma \circ \sigma_1$