Chapter 2.11

Sherri Shulman
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- 1

$$
\begin{aligned}
S_0 &= \{P(x, f(y), z), P(g(a), f(w), u), P(v, f(b), c)\} \\
D_1 &= \{x, g(a), v\} \\
\sigma_1 &= \{x/g(a), v/g(a)\} \\
S_1 &= S_0\sigma_1 = \{P(g(a), f(g), z), P(g(a), f(2), u), P(g(a), f(b)c)\} \\
D_2 &= \{y, w, b\} \\
\sigma_2 &= \{y/b, w/b\} \\
S_2 &= S_1\sigma_2 = \{P(g(a), f(b), z), P(g(a), f(b), u), P(g(a), f(b), c)\} \\
D_3 &= \{z, u, c\} \\
\sigma_3 &= \{a/c, u/c\} \\
S_3 &= S_2\sigma_3 = \{P(g(a), f(b), c)\}
\end{aligned}
$$

- 2 $\{P(x, a), P(b, c)\}$ can't be unified since we can't unify the two constants a, c. $\{P(f(x), z), P(a, w)\}$ can't be unified because we can't unify $a, f(x)$.

- 3 Show that composition of substitutins is not commutative. We only need to find one example. Suppose that $\sigma = \{x/y\}$ and $\lambda = \{y/c\}$. Then $f(x, y)\sigma\lambda = (f(x, y)\sigma)\lambda = f(y, y)\lambda = f(c, c)$. But $f(x, y)\lambda\sigma = (f(x, y)\lambda)\sigma = f(x, c)\sigma = f(y, c)$. These are not the same.