

UNIFICATION EXAMPLE

Find MGU for $W = \{P(a, x, f(g(y))), P(z, f(z), f(u))\}$.

k	W_k	θ_k	W_k singleton?	D_k	occurs check
0	$W_0 = W$	$\theta_0 = \{\}$	no	$\{a, z\}$	true; $v_0 = z,$ $t_0 = a$
		$\theta_1 = \{\} \circ \{z/a\}$ $= \{z/a\}$			
1	$W_1 = W_0\{z/a\}$ $= \{P(a, x, f(g(y))), P(a, f(a), f(u))\}$		no	$\{x, f(a)\}$	true; $v_1 = x,$ $t_1 = f(a)$
		$\theta_2 = \{z/a\} \circ \{x/f(a)\}$ $= \{z/a, x/f(a)\}$			
2	$W_2 = W_1\{x/f(a)\}$ $= \{P(a, f(a), f(g(y))), P(a, f(a), f(u))\}$		no	$\{g(y), u\}$	true; $v_2 = u,$ $t_2 = g(y)$
		$\theta_3 = \{z/a, x/f(a)\} \circ \{u/g(y)\}$ $= \{z/a, x/f(a), u/g(y)\}$			
3	$W_3 = W_2\{u/g(y)\}$ $= \{P(a, f(a), f(g(y))), P(a, f(a), f(g(y)))\}$ $= \{P(a, f(a), f(g(y)))\}$		yes		

Returns $\theta_3 = \{z/a, x/f(a), u/g(y)\}$ as MGU,
with $P(a, f(a), f(g(y)))$ as the common instance.