

**function** UNIFY( $x, y, \theta = \text{empty}$ ) **returns** a substitution to make  $x$  and  $y$  identical, or *failure*  
    **if**  $\theta = \text{failure}$  **then return** *failure*  
    **else if**  $x = y$  **then return**  $\theta$   
    **else if** VARIABLE?( $x$ ) **then return** UNIFY-VAR( $x, y, \theta$ )  
    **else if** VARIABLE?( $y$ ) **then return** UNIFY-VAR( $y, x, \theta$ )  
    **else if** COMPOUND?( $x$ ) **and** COMPOUND?( $y$ ) **then**  
        **return** UNIFY(ARGS( $x$ ), ARGS( $y$ ), UNIFY(OP( $x$ ), OP( $y$ ),  $\theta$ ))  
    **else if** LIST?( $x$ ) **and** LIST?( $y$ ) **then**  
        **return** UNIFY(REST( $x$ ), REST( $y$ ), UNIFY(FIRST( $x$ ), FIRST( $y$ ),  $\theta$ ))  
    **else return** *failure*

**function** UNIFY-VAR( $var, x, \theta$ ) **returns** a substitution  
    **if**  $\{var/val\} \in \theta$  for some  $val$  **then return** UNIFY( $val, x, \theta$ )  
    **else if**  $\{x/val\} \in \theta$  for some  $val$  **then return** UNIFY( $var, val, \theta$ )  
    **else if** OCCUR-CHECK?( $var, x$ ) **then return** *failure*  
    **else return** add  $\{var/x\}$  to  $\theta$