

Program 1

$\text{middle}(x, [x])$.

$\text{middle}(x, [\text{First } | x_s]) :-$

$\text{append}(\text{Middle}, [\text{last}], x_s),$

$\text{middle}(x, \text{Middle}).$

query $\rightarrow \text{middle}(x, [a, b, c])$.

$\text{middle}(x, [a, b, c])$



$\text{append}(\text{Middle}, [\text{last}], [b, c]), \text{middle}(x, \text{Middle})$

$\{ \text{Middle}/b, \text{last}/c \}$

$\text{middle}(x, [b])$

$\{ x/b \}$

$\text{middle}(b, [b])$



tree



$\text{append}(\text{Middle}, [\text{last}], [])$,
 $\text{middle}(x, \text{Middle}).$



false (append will fail)



Program 2

middle(x, [First | xs]) :-

append(Middle, [Last], xs),

middle(x, Middle).

middle(x, [x]).

Query :- middle(a, x).

