

[1] $\text{max}(X, Y, X) \text{ :- } X \geq Y.$

[2] $\text{max}(X, Y, Y) \text{ :- } X < Y.$

?- $\text{max}(5, 4, M), \text{even}(M).$

[1] $\{5/X_1, 4/Y_1, 5/M\}$

?- $5 \geq 4, \text{even}(5). \quad [] \{\}$

?- $\text{even}(5). \quad [] \{\}$ FAIL

?- $5 \geq 4, \text{even}(5).$

$[] \{\}$ FAIL (no other choice)

?- $\text{max}(5, 4, M), \text{even}(M).$

[2] $\{5/X_2, 4/Y_2, 4/M\}$

?- $5 < 4, \text{even}(4). \quad [] \{\}$ FAIL

?- $\text{max}(5, 4, M), \text{even}(M).$

FAIL (no other choice)

The Cut "!" (Controlling control)

1. $\text{max}(X, Y, X) \text{ :- } X \geq Y, ! .$

2. $\text{max}(X, Y, Y) \text{ :- } X < Y.$

?- $\text{max}(5, 4, M), \text{even}(M).$

[1] {5/X₁, 4/Y₁, 5/M}

?- $5 \geq 4, !, \text{even}(5). \quad [] \{ \}$

?- $!, \text{even}(5). \quad [] \{ \}$ Succeed, but make no other
attempt to solve $5 \geq 4$
or $\text{max}(5, 4, M)$

?- $\text{even}(5). \quad [] \{ \}$ FAIL

(no further attempts)

Cut considered harmful

1. $\text{max}(X, Y, X) \text{ :- } X \geq Y, ! .$

2. $\text{max}(X, Y, Y).$

?- $\text{max}(5, 4, M), \text{even}(M).$

FAIL (just as before)

?- $\text{max}(5, 4, 4), \text{even}(4).$

[1] Can't! (No match)

Cut never activated.

?- $\text{max}(5, 4, 4), \text{even}(4).$

[2] $\{5/X_1, 4/Y_1\}$

?- $\text{even}(4). \quad [] \{\}$

?- \square (empty goal list)

SUCCESS !!!