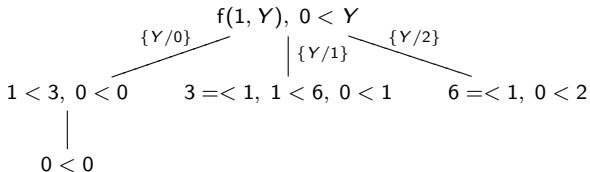
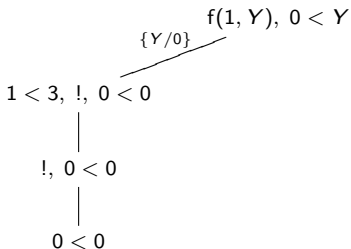


## Program with cuts

$f(X,0) :- X < 3.$   
 $f(X,1) :- 3 \leq X, X < 6.$   
 $f(X,2) :- 6 \leq X.$



$f(X,0) :- X < 3, !.$   
 $f(X,1) :- 3 \leq X, X < 6, !.$   
 $f(X,2) :- 6 \leq X.$

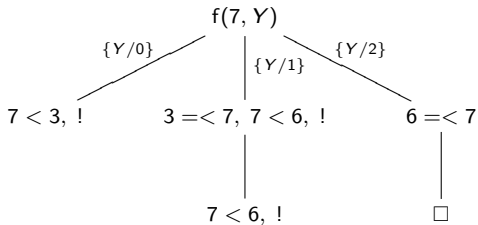


## Program with cuts

$f(X,0) :- X < 3, !.$

$f(X,1) :- 3 \leq X, X < 6, !.$

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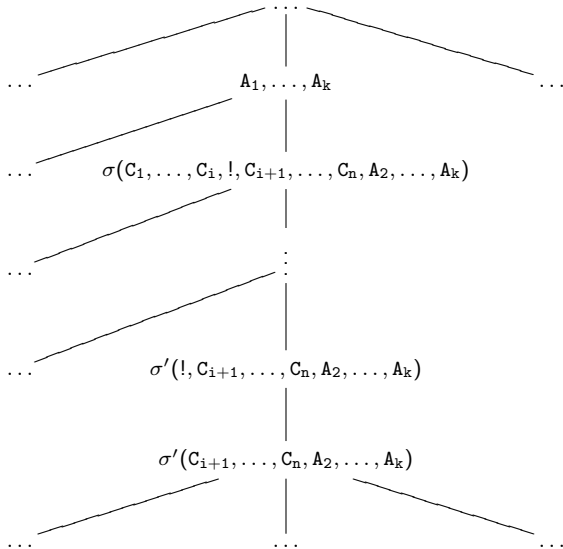


$f(X,0) :- X < 3, !.$

$f(X,1) :- X < 6, !.$

$f(X,2).$

# Effect of cuts



## Example without cut

`a(X) :- b(X).`

`a(5).`

`b(1) :- e(1).`

`b(X) :- c(Y), d(X,Y).`

`b(4).`

`c(1) :- e(1).`

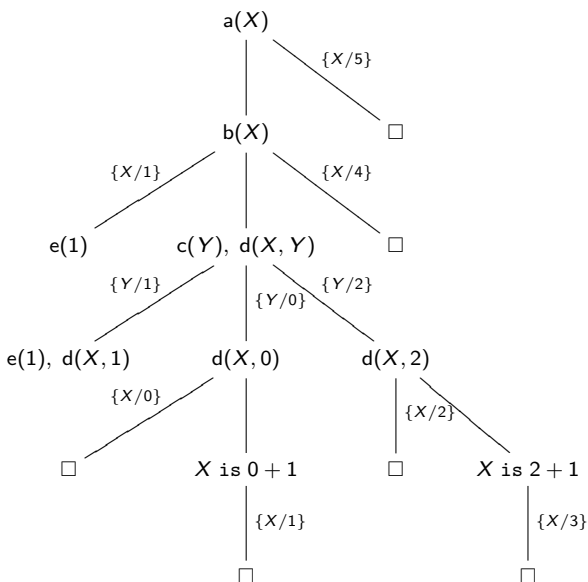
`c(0).`

`c(2).`

`d(X,X).`

`d(X,Y) :- X is Y+1.`

`e(0).`



## Example with cut

a(X) :- b(X).

a(5).

b(1) :- e(1).

b(X) :- c(Y), !, d(X,Y).

b(4).

c(1) :- e(1).

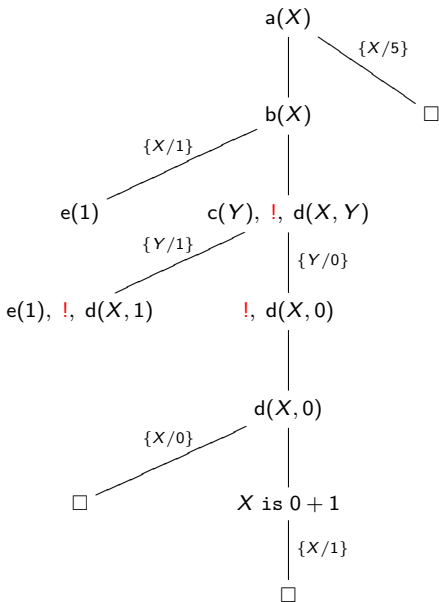
c(0).

c(2).

d(X,X).

d(X,Y) :- X is Y+1.

e(0).



## Programs with cuts

```
gcd(X,0,X).  
gcd(0,X,X).  
gcd(X,Y,Z) :- X =< Y, X > 0, Y1 is Y-X, gcd(X,Y1,Z).  
gcd(X,Y,Z) :- Y < X, Y > 0, X1 is X-Y, gcd(X1,Y,Z).
```

```
gcd(X,0,X) :- !.  
gcd(0,X,X) :- !.  
gcd(X,Y,Z) :- X =< Y, !, Y1 is Y-X, gcd(X,Y1,Z).  
gcd(X,Y,Z) :- X1 is X-Y, gcd(X1,Y,Z).
```

```
remove(_, [], []).  
remove(X, [X|Xs], Ys) :- !, remove(X, Xs, Ys).  
remove(X, [Y|Xs], [Y|Ys]) :- remove(X, Xs, Ys).
```

## Program with negation

```
even(0).  
even(X) :- X1 is X-2, even(X1).
```

```
even(0).  
even(X) :- X >= 2, X1 is X-2, even(X1).
```

```
even(0) :- !.  
even(X) :- X > 0, !, X1 is X-1, not(even(X1)).  
even(X) :- X1 is X+1, not(even(X1)).
```