

```

tracks1(T,D,R,A,Q) :- tracks(T,D,R,A), albums(A,Q).
¬tracks(T,D,R,A) :- tracks(T,D,R,A), not tracks1(T,D,R,A,_),
tracks1(_,_,_,A,_).
¬albums(A, Q) :- albums(A,Q), not tracks1(_,_,_,A,Q),
tracks(T,D,R,A), not ¬tracks(T,D,R,A).

```

***demo2

```

tracks1(T,D,R,A,Q) :- tracks(T,D,R,A), albums(A,Q).
¬tracks(T,D,R,A) :- tracks(T,D,R,A), not tracks1(T,D,R,A,_),
tracks1(_,_,_,A,_).
¬albums(A, Q) :- albums(A,Q), not tracks1(_,_,_,A,Q),
tracks(T,D,R,A), not ¬tracks(T,D,R,A).

```

=====

state-based for ¬tracks

=====

tracks			
track	date	rating	album
Lullaby	1989	3	Galore
Lullaby	1989	3	Show
Lovesong	1989	5	Galore
Lovesong	1989	5	Paris
Trust	1992	4	Wish
Another song	1999	4	Tokyo

album	
album	quantity
Disintegration	6
Show	3
Galore	1
Paris	4
Wish	5

tracks1					
track	date	rating	album	quantity	
Lullaby	1989	3	Show	3	
Lullaby	1989	3	Galore	1	
Trust	1992	4	Wish	5	

(1) tracks(T,D,R,A), not tracks1(T,D,R,A,_)

track	date	rating	album
Lovesong	1989	5	Galore
Lovesong	1989	5	Paris
Another song	1999	4	Tokyo

(2c) tracks(T,D,R,A), not tracks1(T,D,R,A,_), tracks1(_,_,_,A,_).

-tracks			
track	date	rating	album
Lovesong	1989	5	Galore

(2d) tracks(T,D,R,A), not tracks1(T,D,R,A,_), albums(A,_).

track	date	rating	album
Lovesong	1989	5	Galore
Lovesong	1989	5	Paris

=====
state-based for -album
=====

(1) albums(A,Q), not tracks1(_,_,_A,Q)

album	
album	quantity
Disintegration	6
Paris	4

(2) tracks(T,D,R,A), not -tracks(T,D,R,A)

track	date	rating	album
Lullaby	1989	3	Galore
Lullaby	1989	3	Show
Lovesong	1989	5	Paris
Trust	1992	4	Wish
Another song	1999	4	Tokyo

(2) albums(A,Q), not tracks1(_,_,_A,Q), tracks(T,D,R,A), not -tracks(T,D,R,A).

-album	
album	quantity
Paris	4

=====
operation-based for -tracks
=====

(+tracks1 is bottom)

-tracks(T,D,R,A) :- tracks(T,D,R,A), not tracks1(T,D,R,A,_),
tracks1(_,_,_A,_).

=> tracks1 :- +tracks1, tracks1 :- tracks1, not -tracks1
Here, tracks1 in the body is the old tracks1.

```
x-tracks(T,D,R,A) :- tracks(T,D,R,A), not +tracks1(T,D,R,A,_),
+tracks1(_,_,_A,_).
```

```
^^^^^^^^^^^^^^^^^^^^
```

```
x-tracks(T,D,R,A) :- tracks(T,D,R,A), not (tracks1(T,D,R,A,_), not
-tracks1(T,D,R,A,_)) ,+tracks1(_,_,_A,_).
```

```
^^^^^^^^^^^^^^^^^^^^
```

```
-tracks(T,D,R,A) :- tracks(T,D,R,A), not +tracks1(T,D,R,A,_),
tracks1(_,_,_A,_), not -tracks1(_,_,_A,_).
```

```
~~~~~
```

track	date	rating	album	quantity
			Show	
			Wish	

```
-tracks(T,D,R,A) :- tracks(T,D,R,A), not (tracks1(T,D,R,A,_), not
-tracks1(T,D,R,A,_)) , tracks1(_,_,_A,_), not -tracks1(_,_,_A,_).
```

```
~~~~~
~~~~~
```

track	date	rating	album	quantity
Lullaby	1989	3	Show	3
Lullaby	1989	3	Galore	1
Trust	1992	4	Wish	5

=>

```
(a) -tracks(T,D,R,A) :- tracks(T,D,R,A), not tracks1(T,D,R,A,_),
tracks1(_,_,_A,_), not -tracks1(_,_,_A,_).
```

```
~~~~~
```

Another song | 1999 | 4 | Tokyo

```
(a) -tracks(T,D,R,A) :- tracks(T,D,R,A), not tracks1(T,D,R,A,_),
tracks1(_,_,_A,_), not -tracks1(_,_,_A,_).
```

```
^^^^^^^^^^^^^^^^^^^^
```

track	date	rating	album	quantity
			Show	
			Wish	

```
(b) -tracks(T,D,R,A) :- tracks(T,D,R,A), -tracks1(T,D,R,A,_),
tracks1(_,_,_A,_), not -tracks1(_,_,_A,_).
~~~~~
```

track	date	rating	album
Lovesong	1989	5	Galore
Lovesong	1989	5	Paris

=> with state-based for -tracks1

```
-tracks1(T,D,R,A,Q) :- tracks1(T,D,R,A,Q), T='Lovesong'
```

track	date	rating	album	quantity
Lovesong	1989	5	Galore	1
Lovesong	1989	5	Paris	4

```
(a) -tracks(T,D,R,A) :- tracks(T,D,R,A), not tracks1(T,D,R,A,_),
tracks1(_,_,_A,_), not -tracks1(_,_,_A,_).
```

```
tracks(T,D,R,A), not tracks1(T,D,R,A,_)
```

```
Another song | 1999 | 4 | Tokyo
```

```
tracks1(_,_,_A,_), not -tracks1(_,_,_A,_).
```

old tracks1

track	date	rating	album	quantity
			Show	
			Wish	

```
-tracks(T,D,R,A) :- tracks(T,D,R,A), not tracks1(T,D,R,A,_),
tracks1(_,_,_A,_), not -tracks1(_,_,_A,_).
```

empty

-tracks

track	date	rating	album
Lovesong	1989	5	Galore