

## EXERCISE 11

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### Exercise 11.1

Datalog program D without negation, prove the following:

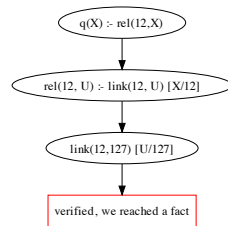
- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

### Exercise 11.2

Given the following Datalog program and the query  $q(X) : \text{rel}(12, X)$ .

```
%% Rule system
rel(X,U) :- link(X,U).
rel(X,U) :- link(X,Z),rel(Z,U).
tie(X,Y) :- rel(X,U),rel(Y,U),x<>y.
%% Facts
link(1,12) link(2,12) link(2,23) link(3,23) link(12,127) link(7,127) link(0,1)
```

1. Evaluate the query using semi-naive bottom-up approach.
2. Evaluate the query using top-down approach. Draw the proof tree



3. What are the pros and cons of top-down evaluation and bottom-up evaluation?