

CSE591: Security Policy Frameworks

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Homework 2. Version: 18Feb2005a. Due 24 Feb 2005.

Suppose you are given a set of constraint facts defining a relation $\text{edge}(x, y, w)$, which holds if there is an edge of weight w between node x and node y .

Notation: Predicate symbols and variables start with a lower-case letter; constants start with an upper-case letter. This notation is not standard, though.

a. Write a Constraint Datalog program that defines a relation $\text{path}(x, y, w)$, which holds if there is a path of weight w between node x and node y . The constraint domain is linear constraints over the real numbers.

b. Apply your program to the following constraint facts. In other words, compute the set of constraint facts derivable from these facts by repeated application of the rules in your program. Justify your answer by showing each application of each rule. Suggestion: Labeling each fact, like the labels (1) and (2) below, makes it easier to describe the calculation.

$$\text{edge}(A, B, w) \leftarrow 0 \leq w \leq 2 \tag{1}$$

$$\text{edge}(B, C, w) \leftarrow 4 \leq w \leq 5 \tag{2}$$