Class 8: Relations

Schedule

Problem Set 3 is due **Friday at 6:29pm**.

Functions

A **function** is a mathematical datatype that associates elements from one set, called the *domain*, with elements from another set, called a *codomain*.

$$f : domain \rightarrow codomain$$

If the function is *total*, every element of the domain has one associated codomain element; if the function is *partial*, there may be elements of the domain that do not have an associated codomain element.

Defining a function. To define a function, we need to describe how elements in the domain are associated with elements in the codomain.

What are the (sensible) domains and codomains of each function below:

$$f(n) ::= |n| \qquad f(x) ::= x^2 \qquad f(n) ::= n+1 \qquad f(a,b) ::= a/b$$

$$f(x) ::= \sqrt{x} \qquad f(S) ::= \text{minimum}_<(S)$$

For which of them is the function *total*?

