Quantified Statements

(a) needs_course $(x, DM) := x$ needs a Course in Discrete maths.

$\forall x$ needs_course (x, DM), domain of x includes all students in CS.

(b) Owns $(x, PC) := x$ owns a personal computer.

$\exists x$ Owns (x, PC), domain of x includes all students in this class.

(c) has_taken $(x, y) := x$ has taken CS course y

$\forall x \exists y$ has_taken (x, y), domain of $x \rightarrow$ students in this class.

domain of $y \rightarrow$ all CS courses.

(d) $\exists x \exists y$ has_taken (x, y), domain of x & y remains the same as (c)

(e) has_been $(x, y) := x$ has been in building y on campus.

$\forall x \forall y$ has_been (x, y), domain of x includes all students in

∀x ∀y has_been (···f)?

includes all students in
this class; domain
of y includes all
buildings on the campus

(f) is_room (Z, y) := Z is a room in building y
has_been (x, Z) := x has been in room Z.

If Z is a room in building y, then x has
been in room Z.

⇒ ∃x ∃y ∀Z (is_room (Z, y) → has_been (x, Z))