Fun with FOL
Student($x$) – predicate; true if $x$ is a student
Vegetarian($x$) – predicate; true if $x$ is a vegetarian
Likes($x$, $y$) – predicate; true if $x$ likes $y$
Student(x) – predicate; true if x is a student
Vegetarian(x) – predicate; true if x is a vegetarian
Likes(x, y) – predicate; true if x likes y

Students are vegetarians.
Student($x$) – predicate; true if $x$ is a student
Vegetarian($x$) – predicate; true if $x$ is a vegetarian
Likes($x$, $y$) – predicate; true if $x$ likes $y$

Students are vegetarians.

\[ \forall x \text{ Student}(x) \rightarrow \text{Vegetarian}(x) \]
Student(x) – predicate; true if x is a student
Vegetarian(x) – predicate; true if x is a vegetarian
Likes(x, y) – predicate; true if x likes y

Some students are vegetarians.
Student\((x)\) – predicate; true if \(x\) is a student
Vegetarian\((x)\) – predicate; true if \(x\) is a vegetarian
Likes\((x, y)\) – predicate; true if \(x\) likes \(y\)

Some students are vegetarians.

\(\exists x \text{ Student}(x) \land \text{Vegetarian}(x)\)
Some students (more than one) are vegetarians.

$$\exists x \text{ Student}(x) \land \text{Vegetarian}(x) \land$$
$$\exists y \text{ Student}(y) \land \text{Vegetarian}(y) \land$$
$$\neg (x = y)$$
Student(x) – predicate; true if x is a student
Vegetarian(x) – predicate; true if x is a vegetarian
Likes(x, y) – predicate; true if x likes y

Some students (more than one, but not all) are vegetarians.

\[
\begin{align*}
  &\exists x \text{ Student}(x) \land \text{Vegetarian}(x) \land \\
  &\exists y \text{ Student}(y) \land \text{Vegetarian}(y) \land \\
  &(x \neq y) \land \\
  &\exists z \text{ Student}(z) \land \neg\text{Vegetarian}(z)
\end{align*}
\]
There is a student who is liked by all vegetarians.
Student(x) – predicate; true if x is a student
Vegetarian(x) – predicate; true if x is a vegetarian
Likes(x, y) – predicate; true if x likes y

There is a student who is liked by all vegetarians.

∃ x Student(x) ∧
∀ y Vegetarian(y) → Likes(y, x)
There is a student who is liked by all vegetarians.

$\exists x \forall y \text{ Student}(x) \land (\text{Vegetarian}(y) \rightarrow \text{Likes}(y, x))$
Student(x) – predicate; true if x is a student
Vegetarian(x) – predicate; true if x is a vegetarian
Likes(x, y) – predicate; true if x likes y

No one who is not a student is a vegetarian.
Student\( (x) \) – predicate; true if \( x \) is a student
Vegetarian\( (x) \) – predicate; true if \( x \) is a vegetarian
Likes\( (x, y) \) – predicate; true if \( x \) likes \( y \)

No one who is not a student is a vegetarian.

\[ \forall x \text{ Vegetarian}(x) \rightarrow \text{Student}(x) \]
No one who is not a student is a vegetarian.

\[ \forall x \text{ Vegetarian}(x) \rightarrow \text{Student}(x) \]

\[ \neg (\exists x \text{ Vegetarian}(x) \land \neg \text{Student}(x)) \]