Can show soundness and completeness theorem for 1st order logic i.e., $\Gamma \models F$ iff $\Gamma \vdash F$ Gödel '30

How to make a theorem prover for 1st order logic.

Basic Idea: Want to reduce to propositional case.

(1) Convert using some of operation previously described formulas (in KB and to be proven) into prenex normal form

$$\forall \vec{x} \exists \vec{y} \forall \vec{z} \ldots \; G(\vec{x}, \vec{y}, \vec{z} \ldots)$$

where G does not quantifiers

(2) Introduce f^n symbols for $\forall$-$\exists$ pairs

Ex) $\forall \vec{x} \exists \vec{y} \; G(\vec{x}, \vec{y}) \Rightarrow G(\vec{x}, f_1(\vec{x}), \ldots f_n(\vec{x}))$

$y_1, \ldots y_n$

(3) Once get open formula convert to CNF and try to use resolution algorithm.

What is different b/w 1st order resolution and propositional resolution?

Now need a concept called unification

Ex) num(0).   now have to match f^n symbols

num(S(X)) :- num(X).

|? - num(S(S(0))).

returns true

|? - num(X).