$A \rightarrow B \sim \neg A \vee B$ → or/disjunction

A	B	$A \rightarrow B$	$\neg A$	$\neg A \vee B$
T	T	T	F	T
T	F	F	F	F
F	T	T	T	T
F	F	T	T	T

If it is a cat then it can swim : T
If it is a cat then it cannot swim : F
If it is not a cat then it can swim : T
If it is not a cat then it cannot swim : T

] consequent do not contradict with antecedant

Inference Rules

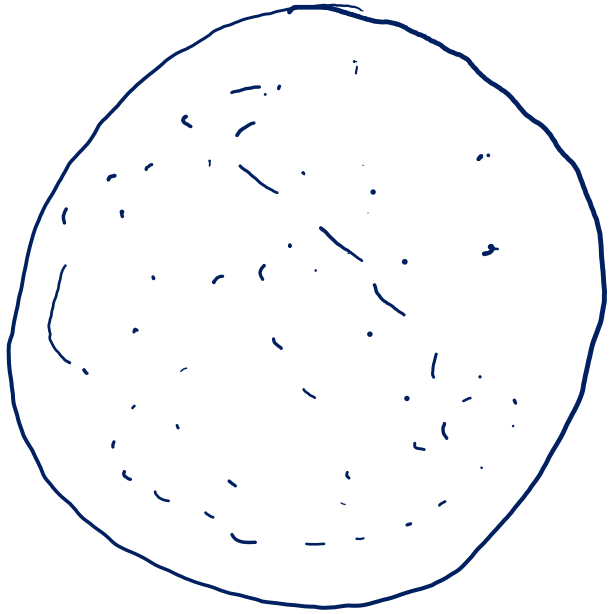
① Universal Elimination

$\forall x$: likes(x, icecream)

x/Karita

likes(Karita, icecream)

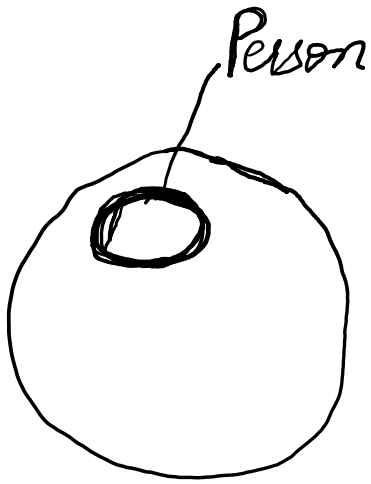
Substitute a ground term



2. Existential Elimination (Skolemization)

$\exists x$: likes(x, icecream)

likes(Person, icecream)



as long as "Person" does not appear elsewhere in the knowledge base

Babar was father of Humanyu — father (Babar, Humanyu)

Humanyu was father of Akbar — father (Humanyu, Akbar)

Akbar was father of Jahangir — father (Akbar, Jahangir)

Jahangir was father of Sahajahan — father (Jahangir, Sahajahan)

Sahajahan was father of Aurenzab — father (Sahajahan, Aurenzab)

$\forall x \exists y$: father (x, y)

$\forall x \forall y \exists z$: father $(x, y) \wedge$ father $(y, z) \longrightarrow$ grandfather (x, z)

father $(x, y) \wedge$ father $(y, g(x, y)) \longrightarrow$ grandfather $(x, g(x, y))$

$$\forall x_1 \forall x_2 \forall x_3 \forall x_4 \forall x_5 \exists y : P(x_1, x_2) \wedge Q(x_2, x_3, x_4) \wedge Z(x_4, x_5, y)$$

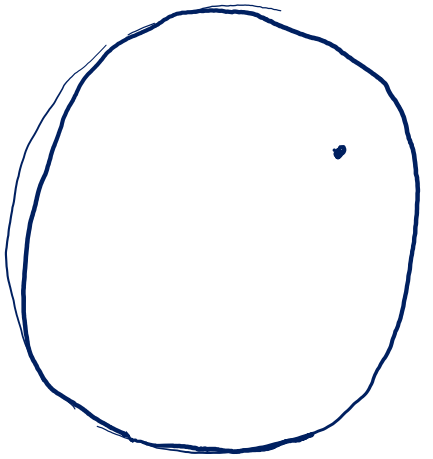
$$P(x_1, x_2) \wedge Q(x_2, x_3, x_4) \wedge Z(x_4, x_5, f(x_1, x_2, x_3, x_4, x_5))$$

Whenever we have a Existential variable bound by some universal variables then this existentially bound variable will be removed by replacing it with a function term having universally bound variables as its arguments

This function name should have been used anywhere in the expression

3. Existential Introduction

likes (Sneha, icecream)



$\exists x$: likes (x, icecream)

Whenever we have a ground term and we need to replace it with a variable then since we have information of only one person we can introduce a variable with Existential Quantifier