HALT

is there some input that makes my alg run forever?

one

Proposition fixed

alg runs forever on some input

Predicates eat

every

x runs forever on y

P(x, y)
Variables

. code

. math

. stars

changeable named value

\[ X = x + 1 \]
my algorithm is faster than yours

___ is faster than ___

my algo faster on most ___

___ is faster than on ___

___ is ___ than ___ on ___
Types: Person

\[ L(x, y) : \text{loves} \]

\[ m : \text{Liker} \]

Everyone loves me bound

\[ \exists x, \ L(x, m) \land L(m, x) \]

There is an \( x \), \[ \forall x, \ L(x, m) \]

\[ \exists x, \ L(x, m) \]

\[ \neg \exists x, \ L(x, m) \]
domain : set of all allowed values of variables

Variable

Predicate
Quantifiers

For all

\[ \forall x . \ L(x, x) \]

Predicates

Proposition

Var

easy to
disprove

easy to
prove

There exists

\[ \exists x . \ L(x, x) \]
\forall x. P(x)

\neg \forall x. P(x) \equiv \exists x. \neg P(x)

\neg \exists x. P(x) \equiv \forall x. \neg P(x)

\exists x. P(x)

\exists \exists \equiv \exists