Engineering Mathematics III

Discrete Mathematics

Lecture 22

Universe of Discourse

This course is taught to Computer Science Engineering students in SMIT, India during Jun-Dec, 2019.

$\exists x, M(x)$

Scope of $\exists$: $M(x)$

Scope of x in $\exists \Rightarrow M(x)$

$M(x)$: x is a dog

$N(x)$: x is an animal

Every dog is an animal.

$\forall x, (M(x) \rightarrow N(x))$

Let say My ~~universe is Dogs~~.

$\forall x, \neg N(x)$.

Universe of discourse

Symbolize the expression

"Everyone has exactly one favourite language"

$M(x,y)$: x has a favorite language y

~~$\forall x, M(x,y)$~~

$\forall x, \exists y, M(x,y) \wedge (\forall z, z \neq y, \neg M(x,z))$

Universe of discourse:

people having Exactly one favorite language

$M(x,y)$: y is a favorite language of x

$$\forall x, \exists y, M(x,y)$$

Everyone in the final year class has a mobile

Symbolic form:

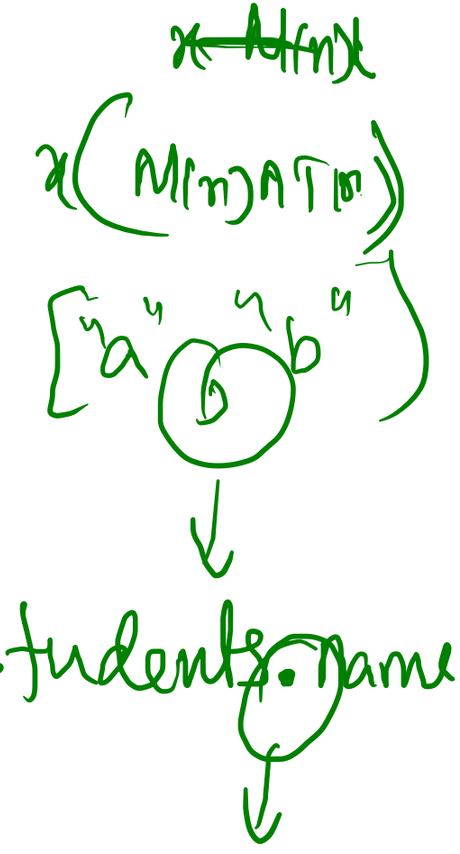
$F(x)$: x is in the final year class

$M(x)$: x has a mobile.

$\forall x \left(F(x) \rightarrow M(x)\right)$

Universe of discourse: A set of all students in final year

$x \, (M(x))$.



$P(x)$: x is greater than 2

Ex: $\forall x, P(x)$

$\exists x, P(x)$

verify that whether the statement is true or false in the following universe of discloe.

(a) $\{-5, -3, 0, 1, 2\}$ — The statement is False in this universe of discloe.

(b) $\{3, 5, 7, 10\}$ — 372 ⇒ Statement is true in this ud

(c) $\{-1, 0, 2, 6\}$ — 672 ⇒ " "