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CSE 494: AI for Cyber Security
Shakarian - Friday 1 pm
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CSE 494 OYO Homework 3

1. According to the lecture slides, given that there is not another \exists to existentially quantify B (instead there is a comma), **the statement is not valid.**

2.
 - a. *Some kids*: $\exists x (\text{Kid}(x) \wedge \text{Plays}(x, \text{football}, \text{December } 2018))$
 - b. *Only one kid*: $\exists x (\text{Kid}(x) \wedge \text{Plays}(x, \text{football}, \text{November } 2018))$
 $\wedge \forall y y \neq x \Rightarrow \neg \text{Plays}(x, \text{football}, \text{November } 2018))$
 - c. $\forall x, y, z (\text{Person}(x) \wedge \text{Insurance}(y) \wedge \text{Expensive}(y)) \Rightarrow \neg \text{Buys}(x, y, z)$
 - d. $\exists x (\text{Company}(x) \wedge \forall y, z \text{ Insurance}(y) \wedge \text{Sells}(x, y, z) \Rightarrow (\text{Person}(z) \wedge \neg \text{Insured}(z))$

3. All Indonesians eat the same vegetable.
 - Using $\text{Vegetable}(y)$ to define a vegetable y and $\text{Eats}(x, y)$ to define person x eats vegetable y as the vocabulary:
 - If there exists a vegetable y then person x eats vegetable y.

$\exists y \text{ Vegetable}(y) \Rightarrow \text{Eats}(\text{Indonesians}, y)$