LIS 561 Assignment 4 Set Theory

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Part 1

1.

a. $(\mathrm{S} \cup \mathrm{V}) \cap \mathrm{U} = \{1, 2, 3, 4\}$
b. $(\mathrm{S} \cap \mathrm{T}) \cup \mathrm{U} = \{1, 2, 3, 4, 5, 9\}$

2. $\mathrm{S} \times \mathrm{T} = \emptyset$

4. Set

$\mathrm{S} \cap \mathrm{U} \cap \mathrm{T} = \mathrm{A},$

$\mathrm{S} \cap \mathrm{U} - \mathrm{A} = \mathrm{B},$

$\mathrm{S} \cap \mathrm{T} - \mathrm{A} = \mathrm{C},$

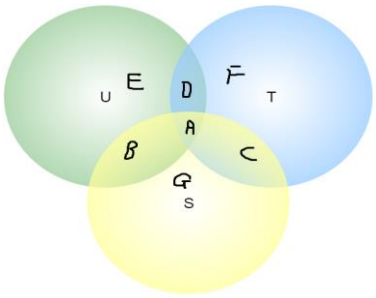
$\mathrm{U} \cap \mathrm{T} - \mathrm{A} = \mathrm{D},$

$\mathrm{U} - (\mathrm{B} \cup \mathrm{D}) = \mathrm{E},$

$\mathrm{T} - (\mathrm{C} \cup \mathrm{D}) = \mathrm{F},$

$\mathrm{S} - (\mathrm{B} \cup \mathrm{C}) = \mathrm{G}$

A, B, C, D, E, F, G might be ϕ



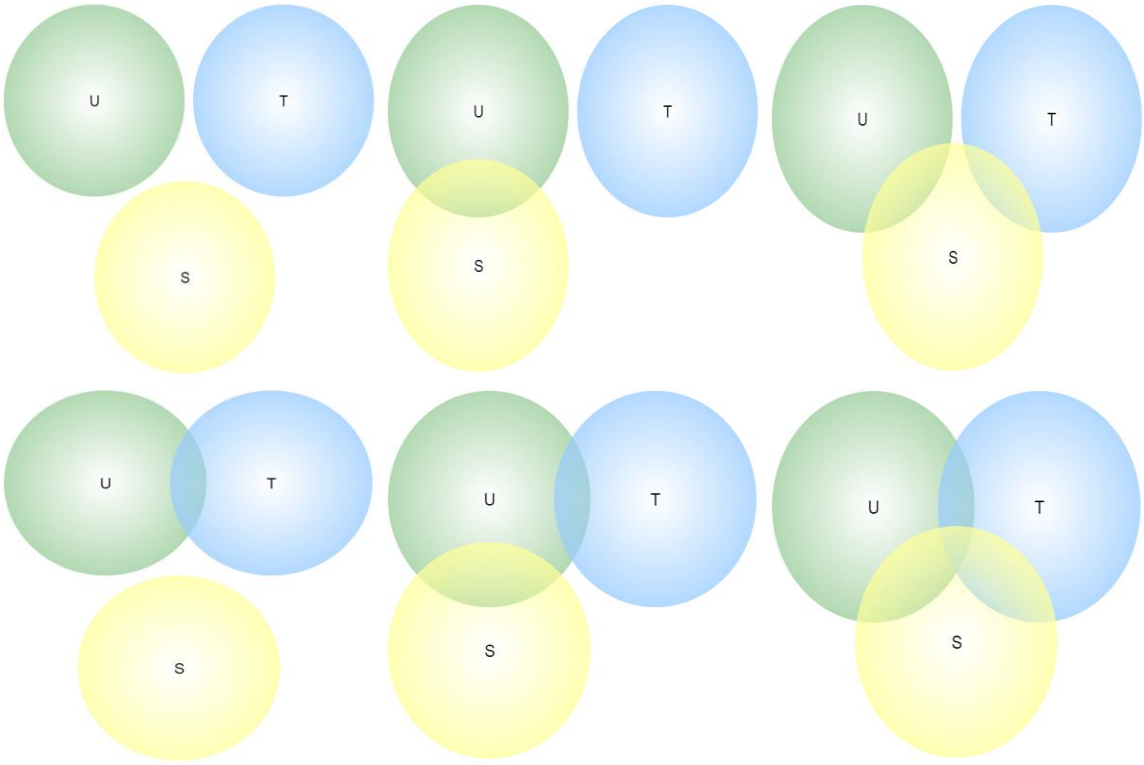
a. $\mathrm{S} \cap (\mathrm{T} \cup \mathrm{U}) = (S \cap T) \cup (S \cap U)$

A+B+C

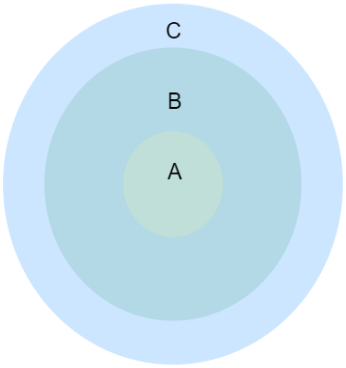
b. $\mathrm{S} \cup (\mathrm{T} \cap \mathrm{U}) = (S \cup T) \cap (S \cup U)$

A+B+C+D+G

Different circumstances:



5. A/B is the set of elements that is in B but not in A. A/C is the set of elements that is in C but not in B. $A \cup B = B$



10. b.

a and c are subsets but not elements in the set.

Part 2

$\text{Professor dubin} \in \{x|x \text{ is a person.}\}$

$\{x|x \text{ is a person}\} \subseteq \{y|y \text{ is a living thing.}\}$

Part 3

In order to justify that Professor Dubin is a subclass of person, and not an individual instance of that class, Professor Dubin should have instances (elements in sets). We are changing $\text{Professor dubin} \in \{x|x \text{ is a person.}\}$ To $\{z|z \text{ is a type of Professor dubin.}\} \subseteq \{x|x \text{ is a person.}\}$

For elements in $\{z|z \text{ is a type of Professor dubin.}\}$, examples are Professor Dubin in LIS561 FA16, Professor Dubin in LIS561 SP16, Professor Dubin in LIS561 FA15, Professor Dubin in LIS561 SP16…or Professor Dubin for LIS561, Professor Dubin for LIS562, Professor Dubin for LIS 562…(just example).