EXERCISES OF WEEK ELEVEN

Exercise 1. Suppose that a model satisfies ***A*1**, ***A*2**, ***A*3**, ***A*4** and that there exists a set $x \in \mathscr{U}$. Then, there exists an element y such that $x \neq y$.

Exercise 2. Let A be a partially ordered class. That is, there exists a subclass

$$G \subseteq A \times A$$

such that G is

(Reflexive) $$id_A \subseteq G$$

(Antisymmetric) $$G \cap G^{-1} \subseteq id_A$$

(Transitive) $$G \circ G \subseteq G.$$

Suppose that $\langle A, G \rangle$ is a fully ordered class. Can you express such definition in terms of G?

Exercise 3. Let $(A, \leq)$ and $(B, \leq)$ two partially ordered class. Let $g \colon A \to B$ be an order-preserving function. Prove the following.

a) if g is strictly increasing, then for every $a \in A$ there holds
$$\bar{g}(S_a) \subseteq S_{g(a)};$$
b) if A is a fully ordered class, g is strictly increasing and surjective, then for every $a \in A$ there holds
$$\bar{g}(S_a) = S_{g(a)}.$$

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