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Chapter 1

Philosophers

$$\text{OrderTrichotomy}(<, S) := \forall_{x,y \in S} (x < y \vee x = y \vee y < x)$$

$$\text{OrderTransitivity}(<, S) := \forall_{x,y,z \in S} ((x < y \wedge y < z) \implies x < z)$$

$$\text{Order}(<, S) := \text{OrderTrichotomy}(<, S) \wedge \text{OrderTransitivity}(<, S)$$

$$\text{BoundedAbove}(E, S, <) := \text{Order}(<, S) \wedge E \subset S \wedge \exists_{\beta \in S} \forall_{x \in E} (x \leq \beta)$$

$$\text{BoundedBelow}(E, S, <) := \text{Order}(<, S) \wedge E \subset S \wedge \exists_{\beta \in S} \forall_{x \in E} (\beta \leq x)$$

$$\text{UpperBound}(\beta, E, S, <) := \text{BoundedAbove}(E, S, <) \wedge \beta \in S \wedge \forall_{x \in E} (x \leq \beta)$$

$$\text{LowerBound}(\beta, E, S, <) := \text{BoundedBelow}(E, S, <) \wedge \beta \in S \wedge \forall_{x \in E} (\beta \leq x)$$

$$\text{LUB}(\alpha, E, S, <) := \text{UpperBound}(\alpha, E, S, <) \wedge \forall_{\gamma} (\gamma < \alpha \implies \neg \text{UpperBound}(\gamma, E, S, <))$$

$$\text{GLB}(\alpha, E, S, <) := \text{LowerBound}(\alpha, E, S, <) \wedge \forall_{\beta} (\alpha < \beta \implies \neg \text{LowerBound}(\beta, E, S, <))$$

$$\text{LUBProperty}(S, <) := \forall_E \left((\emptyset \neq E \subset S \wedge \text{BoundedAbove}(E, S, <)) \implies \exists_{\alpha \in S} (\text{LUB}(\alpha, E, S, <)) \right)$$

$$\text{GLBProperty}(S, <) := \forall_E \left((\emptyset \neq E \subset S \wedge \text{BoundedBelow}(E, S, <)) \implies \exists_{\alpha \in S} (\text{GLB}(\alpha, E, S, <)) \right)$$

$$\text{LUBPropertyImpliesGLBProperty} \quad \text{LUBProperty}(S, <) \implies \text{GLBProperty}(S, <)$$

$$1. \text{LUBProperty}(S, <) \implies \dots$$

$$1.1. \forall_E \left((\emptyset \neq E \subset S \wedge \text{BoundedAbove}(E, S, <)) \implies \exists_{\alpha \in S} (\text{LUB}(\alpha, E, S, <)) \right)$$

$$1.2. (\emptyset \neq B \subset S \wedge \text{BoundedBelow}(B, S, <)) \implies \dots$$

$$1.2.1. |B| = 1 \implies \dots$$

$$1.2.1.1. \{u\} := B$$

$$1.2.1.2. \text{GLB}(u, B, S, <)$$

$$1.2.1.3. \exists_{\beta_0 \in S} (\text{GLB}(\beta_0, B, S, <))$$

$$1.2.2. |B| = 1 \implies \exists_{\beta_0 \in S} (\text{GLB}(\beta_0, B, S, <))$$

$$1.2.3. |B| \neq 1 \implies \dots$$

$$1.2.3.1. |B| > 1$$

$$1.2.4. L := \{s \in S \mid \text{LowerBound}(s, B, S, <)\}$$

$$1.2.5. ?? \emptyset \neq L$$

$$2. \text{Fourth}$$

Chapter 2

First Chapter

1. First
 - 1.1. Second
 - 1.2. Third
2. Fourth

This will be an empty chapter and I will put some text here

$$\sum_{i=0}^{\infty} a_i x^i \tag{2.1}$$

The equation [2.1](#) shows a sum that is divergent. This formula will later be used in the page ??.

For further references ■see [Something Linky](#) or go to the next url: <http://www.sharelatex.com> or open the next file [File.txt](#)

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If you read this text, you will get no information. Really? Is there no information?

