

Ordinals and Typed Lambda Calculus

Course Introduction

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Administrative Information

Course web page

<http://www1.eafit.edu.co/asr/courses/ordinals-and-typed-lambda-calculus/>

Lectures dates, source code, etc.

See course web page.

Informally Building Sets

Definition

A set is **pure** iff its members are also sets.

Notation

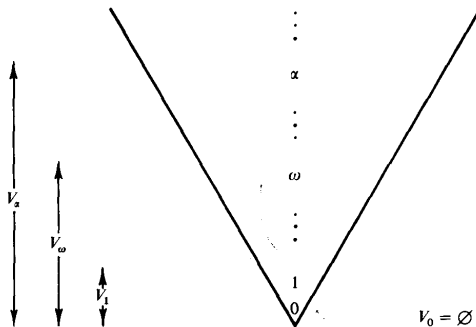
Let A be a set. The power set of A is denoted by PA .

Convention

We shall use the terms 'ordinal number' and 'ordinal' interchangeably.

Informally Building Sets

The ordinal numbers are the backbone of the universe of (pure) sets*



$$V_0 := \emptyset$$
$$V_{n+1} := \mathcal{P}V_n$$

$$V_\omega := V_0 \cup V_1 \cup \dots$$
$$V_{\omega+1} := \mathcal{P}V_\omega$$

$$V_{\alpha+1} := \mathcal{P}V_\alpha$$

*Figure source: [Enderton 1977, Fig. 3].

Classifying the Ordinals

ordinals $\left\{ \begin{array}{l} \text{zero ordinal} \\ \text{successor ordinal} \\ \text{limit ordinal} \end{array} \right.$

ordinals $\left\{ \begin{array}{l} \text{countable} \left\{ \begin{array}{l} \text{computable } (\lambda\text{-definable or constructive}) \\ \text{incomputable} \end{array} \right. \\ \text{uncountable} \end{array} \right.$

References



Enderton, Herbert B. (1977). Elements of Set Theory. Academic Press (cit. on p. 4).