

ANALYSIS -I

B V Rajarama Bhat

Indian Statistical Institute, Bangalore

Lecture 2: Set theory and Russell's paradox

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- ▶ $\mathbb{Z} = \{\dots, -2, -1, 0, 1, 2, \dots\}$ -the set of integers.

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- ▶ The main point here is that given an object we should be clear as to whether it is an element of the set or not.
- ▶ This is a requirement so that we do not have any confusion. Still the definition is only an informal one.

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- ▶ Let us see some more paradoxes of similar type.

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- ▶ More hetero-logical words: **JAPANESE**, **HYPHENATED**, **MONOSYLLABIC**, ...
- ▶ What about the adjective '**HETEROLOGICAL**'? We again face a problem.

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- ▶ There is a problem with the Second Catalogue. Should it list itself or not?

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- ▶ Along with these most mathematicians use the Axiom of Choice, which says given a non-empty collection of non-empty sets one can form a set containing at least one element from each set, or equivalently, the Cartesian product of a non-empty collection of non-empty sets is non-empty.

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