Week 6: Gödel's Second Incompleteness Theorem

Mathematical Logic Course

April 24, 2023

Introduction

- Welcome to Week 6 of our Mathematical Logic Course!
- This week, we'll explore Gödel's Second Incompleteness Theorem and its implications.
- We'll cover the following topics:
  - Statement and proof sketch of Gödel's Second Incompleteness Theorem
  - Consequences for formal systems and consistency proofs

Gödel's Second Incompleteness Theorem

- Statement of the theorem
- What does it mean for a formal system to be unable to prove its own consistency?
- Building on Gödel's First Incompleteness Theorem

Proof Sketch

- A brief overview of the proof of Gödel's Second Incompleteness Theorem
- The role of the Gödel sentence and representability
- Demonstrating the unprovability of consistency

Implications and Consequences

- What are the implications of Gödel's Second Incompleteness Theorem?
- Limits on proving consistency within formal systems
- The impact on foundational mathematics and philosophy

Summary and Conclusion

- Recap of the topics covered in this lecture
- Gödel's Second Incompleteness Theorem and its significance
- Next week, we'll explore related topics such as Church-Turing Thesis and Lambda Calculus

Questions and Discussion

- Do you have any questions about today's lecture?
- Let's discuss the material and explore any questions you may have

Coding Exercises

- Exploring the limitations of consistency proofs in Python
- Understanding the relationship between the First and Second Incompleteness Theorems