

BACHELOR THESIS REVIEW

Title: The incompleteness theorems and Berry's paradox

Author: Maroš Grego

Summary of the content

The underlying thesis by Maroš Grego presents an alternative proof of Gödel's first incompleteness theorem, following a paper by Chaitin. The proof consists of giving a formalization of Berry's paradox („the smallest number not definable in under 57 characters“) in first-order arithmetic. In fact, two such formalizations are presented: one based on Kolmogorov complexity (as suggested by Chaitin), and another one based on formula length (as suggested by Boolos).

Overall evaluation

Thesis topic. The topic of this thesis is appropriate for a Bachelor thesis, both with respect to its level of difficulty and the required pre-existing knowledge.

Own contribution. Chaitin's original paper only gives a very rough outline of the proof idea on a single page. The underlying thesis gives some background and fills in many gaps, in order to present the proof in a self-contained way. Furthermore, it compares it with Boolos approach. All of this is clearly the student's original work.

Mathematical level. The mathematical level of the thesis is high: It is evident from the thesis that the student is familiar with notions in mathematical logic, and knows how to use them. All the proofs are correct and formulated in a rigorous way.

Working with resources. The thesis makes it clear, which resources were used. The relevant literature is cited in a formally correct manner.

Presentation. The thesis is very well-written and uses clear English. Several graphics and tables help to illustrate some of the more technical definitions.

Additional comments

1. The title of the thesis implies that both of Gödel's incompleteness theorems are discussed, however only the first one is...
2. There are a few minor typos (e.g. „the theorem 3.1.“ → „Theorem 3.1.“ (recurring), bracketing in the formula in Definition 4.8., doi of „Computability and Logic“ in the Bibliography)

Conclusion

I consider the thesis to be excellent and recommend it to be accepted as a Bachelor thesis.

Opponent:

Michael Kompatscher

Date & Signature