Abstract

This bachelor thesis is dealing with complete Boolean algebras and its use in semantics of first-order predicate logic. This thesis has two main goals, at first it is to show that every Boolean algebra can be extended to a complete Boolean algebra such that the former Boolean algebra is its dense subalgebra. This theorem is proved using topological construction. Afterwards, in the second part, we define semantics for first-order predicate logic with respect to complete Boolean algebras, which includes introduction of the Boolean-valued model. Then we prove completeness theorem with respect to all complete Boolean algebras. The theorem is proven using ultrafilters on Boolean algebras.

Keywords: Boolean algebras, complete Boolean algebras, classical logic.