1089-68-393 **Tamon Stephen** and **Timothy Yusun*** (tyusun@sfu.ca), Faculty of Science, Simon Fraser University, 250 - 13450 102nd Avenue, Surrey, BC V3T0A3, Canada. *Counting inequivalent monotone Boolean functions.*

Monotone Boolean functions (MBFs) are Boolean functions $f : \{0,1\}^n \to \{0,1\}$ satisfying the monotonicity condition $x \leq y \Rightarrow f(x) \leq f(y)$ for any $x, y \in \{0,1\}^n$. The number of MBFs in n variables is known as the nth Dedekind number. It is a longstanding computational challenge to determine these numbers exactly – these values are only known for n at most 8. Two monotone Boolean functions are equivalent if one can be obtained from the other by renaming the variables. The number of inequivalent MBFs in n variables was known only for up to $n = 6$. In this paper we propose a strategy to count inequivalent MBF's by breaking the calculation into parts based on the profiles of these functions. As a result we are able to compute the number of inequivalent MBFs in 7 variables. The number obtained is 490013148. (Received February 19, 2013)