Monotone Boolean functions (MBFs) are Boolean functions $f : \{0, 1\}^n \rightarrow \{0, 1\}$ 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 $n$th 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)