This thesis addresses the performance of AI algorithms in the board game Hive. It implements and evaluates Alpha-Beta pruning and Monte Carlo Tree Search in this complex game setting. The study demonstrates that Alpha-Beta significantly outperforms MCTS, achieving perfect results against baselines. Additionally, the Alpha-Beta agent won against an intermediate-level human player and nearly won against an expert-level player. Compared to previous works, this research achieves better performance against human players.