

# Query Complexity of Mastermind Variants

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## **Abstract**

We analyze variants of the popular board game Mastermind. In this two-player game, the codebreaker submits queries with the goal of identifying a hidden sequence, constructed at the beginning of the game by the codemaker. At each step, the codebreaker receives feedback in the form of “black” and “white” hits and incorporates the response into his next guess. We discuss asymptotics for the number of guesses needed to identify an unknown  $n$ -vector constructed from  $k$  possible colors. We look at strategies that receive two-color responses, as well as black hit-only responses. We consider both allowing and prohibiting repeated colors in the hidden sequence, and we analyze both adaptive and non-adaptive guessing strategies.

- 1    Introduction**
- 2    Adaptive Strategies**
- 3    Non-Adaptive Strategies**

## References