TCG Final Report

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1. How to compile

   I compile the code in Windows using the makefile.

2. Code explanation

   a. NegaScout

   It is implemented in the SearchMax() function. The flip decision is also done in the function by calculating the expected value for each position to flip by searching a fixed depth.

   b. Hash table

   The hash table is passed as an argument of SearchMax(). I don't insert a hash entry if the search fails high or fails low (not exact). A hash hit only happen if the hash value and depth both match.

   c. Evaluating function

   The score of a board consists of the score of each piece (3^n except cannon) and the distance of each pair of pieces (A,B) if A can capture B.

   d. Iterative deepening

   I don't use time cut in a search, so a call to NegaScout will always search the entire tree. Instead I check the time after a search. If the time does not exceed the limit, I will search again with a deeper depth.

   e. Prevent cycle

   I use another hash to record previous boards. If a board passed into SearchMax() has appeared already, the function returns 0. By this method, it will avoid getting into a cycle if the player has advantage and will want to get into a cycle and tie the game if the player has disadvantage.