

Re: Chess boards & connections.

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- *From:* dynamics@xxxxxxxxxxxxx
 - *Date:* 20 Apr 2006 14:40:28 -0700
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Michael Stemper wrote:

In article <1145555339.841442.203250@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx>, dynamics writes:

Trying to calculate if I can write a Chess AI.

I need to define all possible boards.

I have a total of 64 different pieces, 16 for Black and 16 for White to start, and since each pawn can be promoted, to either a Queen or Knight, a

They can't be promoted to a bishop or a rook?

LOL, then you'll totally fuck my math, actually
I have a patch, but you're right ;-)

further 16 for B&W's 8 pawns for another 32.

There are 65 locations on the board, $8*8 + 1$ for non-existence called the side bar.

So I dimension an Array, (64,65) where the 64 provides the *serial number* for all possible pieces and each of those can be in 65 locations, providing $64*65=4160$ boards.

Nope.

Place the first of the 64 pieces. How many choices for a square do you have? 65. Now, for each of those possibilities, you have 64 choices for placing the second piece. So, two pieces already uses up your 4160 boards. If you place a third piece, you'll have 63 available squares

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for each of those 4160 possibilities, or $65 \cdot 64 \cdot 63 = 262080$. To place 64 pieces on 65 squares — even with disallowing two pieces on the same square from the start — you're going to have 65! possible boards.

I'd say that, since each player can only have 16 pieces at any time, you number the pieces 1–16 (or 0–15 if you prefer), and keep track of what type of piece (Q, K, Kt, p, etc.) each one is. This way, you only have 32 pieces to deal with. Then, you probably should get rid of your "sidebar" and just not necessarily have all of the pieces included in the board at any time.

You are too complicated. All I needed was the 2D Array I defined by matrix (64,65) defining all boards.

This strategy will reduce the number of configurations to $(64!)/(32!)$ time some multiplier based upon how many duplicate pieces a player has.

(I'll skip using exclusion right now, like two pieces can't occupy the same square, but all that means is there are < 4160 possible boards).

Nope. Like I pointed out above, even if you build in "exclusion" from the start, you'll need to add a lot of zeros to the right of "4160"

Well then provide the needed Array, I'll repeat I get a (64,65) for ALL configurations, including many that are impossible.

((J. Baez sucked me into this with his set/group theory stuff, so I thought I'd apply that to Chess))

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Michael F. Stemper

Thanks
Ken

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