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recursive defn: winning hex strategy

- any 1p-win hex strat can be described as
 - a move, optionally followed by 2p-win strat
- any 2p-win hex strat can be described as

two or more 1p-win strats, such that

the intersection of the carriers of the 1p-win strats is empty

• any such strat can be described in and-or form



and-or expression $b2 \land ((b1 \land (a3 \lor b3)) \lor (c1 \land (a3 \lor b3)) \lor (a3 \land (b1 \lor c1)) \lor (b3 \land (b1 \lor c1)))$ (alternate) b2.((b1.(a3|b3)) . (c1.(a3|b3)) . (a3.(b1|c1)) . (b3.(b1|c1))) and-or tree





this strategy has a more compact and-or form

expression $b2 \land (b1 \lor c1) \land (a3 \lor b3)$

(alternate) b2.(b1|c1).(a3|b3)

tree





expanded defn: winning hex strategy

- any 1p-win hex strat can be described as
 - a move, optionally followed by ONE OR MORE 2p-win strats
- any 2p-win hex strat can be described as

two or more 1p-win strats, such that

the intersection of the carriers of the 1p-win strats is empty

• any such strat can be described in and-or form

another example



a3.(a2.(a1|b1)|c1.(b2|c2.(b3|c3)))





how to follow b2.(b1|c1).(a3|b3) ?

- play 1.B[b2]
- remains S = (b1|c1) . (a3|b3)
- \bullet after 1.B[b2] 2.W[a3] ?
 - find or-strat O_j of S containing a3here $O_j = (a3 | b3)$ find and-substrat A_x of O_j not containing a3here $A_x = b3$ play move of A_x here b3



how to follow b2.(b1|c1).(a3|b3) ?

- play 1.B[b2]
- remains S = (b1|c1) . (a3|b3)
- \bullet after 1.B[b2] 2.W[c1]?
 - find or-strat O_j of S containing c1here $O_j = (b1 | c1)$ find and-substrat A_x of O_j not containing c1here $A_x = b1$ play move of A_x here b1



how to follow b2.(b1|c1).(a3|b3)?

- play 1.B[b2]
- remains S = (b1|c1) . (a3|b3)
- after 1.B[b2] 2.W[c3]?

- find or-strat O_j of S containing c3

here no such O_j

play anywhere



how to follow a3. (a2.(a1|b1) | c1.(b2| c2.(b3|c3)))





how to follow a3. (a2.(a1|b1) | c1.(b2| c2.(b3|c3)))

- play 1.B[a3]
- remains S = (a2.(a1|b1) | c1.(b2|c2.(b3|c3)))
- after 1.B[a3] 2.W[b3]?
 - find or-strat O_j of S containing b3here $S = O_j$ find and-substrat A_x of O_j not containing b3here $A_x = a2. (a1|b1)$ play move of A_x here a2







- play 1.B[a2]
- remains S = (a1|b1) . (a3|c2.(b2|c1).(b3|c3))
- after 1.B[a2] 2.W[b1]?
 - find or-strat O_j of S containing b1here $O_j = (a1|b1)$ find and-substrat A_x of O_j not containing b1here $A_1 = a1$ play move of A_x here a1



- play 1.B[a2]
- remains S = (a1|b1) . (a3|c2.(b2|c1).(b3|c3))
- after 1.B[a2] 2.W[c1]?
 - find or-strat O_j of S containing c1 here $O_2 = (a3|c2.(b2|c1).(b3|c3))$
 - find and-substrat A_x of O_j not containing b1 here $A_1 = a3$
 - play move of A_x here a3



- play 1.B[a2]
- remains S = (a1|b1) . (a3|c2.(b2|c1).(b3|c3))
- after 1.B[a2] 2.W[a3]?
 - find or-strat O_j of S containing a3 here $O_2 = (a3|c2.(b2|c1).(b3|c3))$
 - find and-substrat A_x of O_j not containing a3 here c2.(b2|c1).(b3|c3))
 - play move of A_x here c2

conclusion

in this hex strat format,

opponent moves don't appear

pro no opp't moves, so compact notation

con search required to find replying move