Work alone. Discussion with other(s) is allowed but **must** be acknowledged. Sharing of details in **any** way (written, electronic, etc) is not allowed. There are penalties for breaking these rules.

1. Consider the game tree example in the proof number search survey paper. Assume leaves DIJFGH have respective root-player win/loss values WWLLLW. Assume when choosing best child that, in case of a tie, the child which comes *last* in alphabetic order is selected. Trace the execution of `df-pn` from Figure 5 on the game tree, starting from the beginning.

2. Read the Nature paper *Mastering the game of Go with deep neural networks and tree search*.

   `http://www.nature.com/nature/journal/v529/n7587/full/nature16961.html`

   - What to you is the most surprising aspect of this work ?
   - Pick a game other than Go, and explain whether you think this approach would work for your game

3. Watch part 1: *Video Tutorial for the Game of Go - Part I, Overview (WeiQi, Baduk).* `https://www.youtube.com/watch?v=gECcsSeRcNo` Also watch parts 2,3a (and 3b if you want) in the same series.

   (i) Define the territory scoring system. Also define ko, sente, ladder.

   (ii) Play a 5×5 Go game against an opponent (computer or human). Do not start in the centre. Draw a picture (or screenshot) of the final position and give the score, using territory scoring.

   (iii) n×n Hex has been solved (win/loss value of 1st move found), for all $n \leq 9$, but n×n Go has been solved only for $n \leq 5$. Why do you think this is?

4. Read the Nature article *http://www.nature.com/news/go-players-react-to-computer-defeat-1.19255*

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   Who do you think will win in the match vs Lee Sedol? Justify briefly.

5. For 3×3 go, show that (i) opening A1 loses (ii) opening A2 wins (iii) opening B2 wins.

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a3  b3  c3
a2  b2  c2
a1  b1  c1
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