

Aspect ratio test slide

This should
be a square.

If this is a
square, these
slides have
been stretched
from
4:3 to 16:9.

MENACE

Matthew Scroggs

 @mscroggs
mscroggs.co.uk

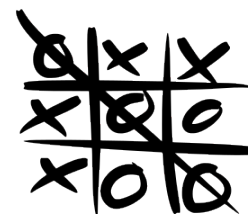
A magazine for the mathematically curious **ISSUE 04 // AUTUMN 2016**



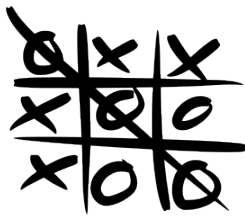
PRIZE CROSSNUMBER + TOP TEN CHALK COLOURS WHAT'S HOT + WHICH MATHS BRANCH ARE YOU?

contact@chalkdustmagazine.com

Donald Michie

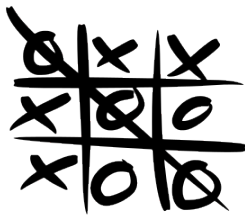


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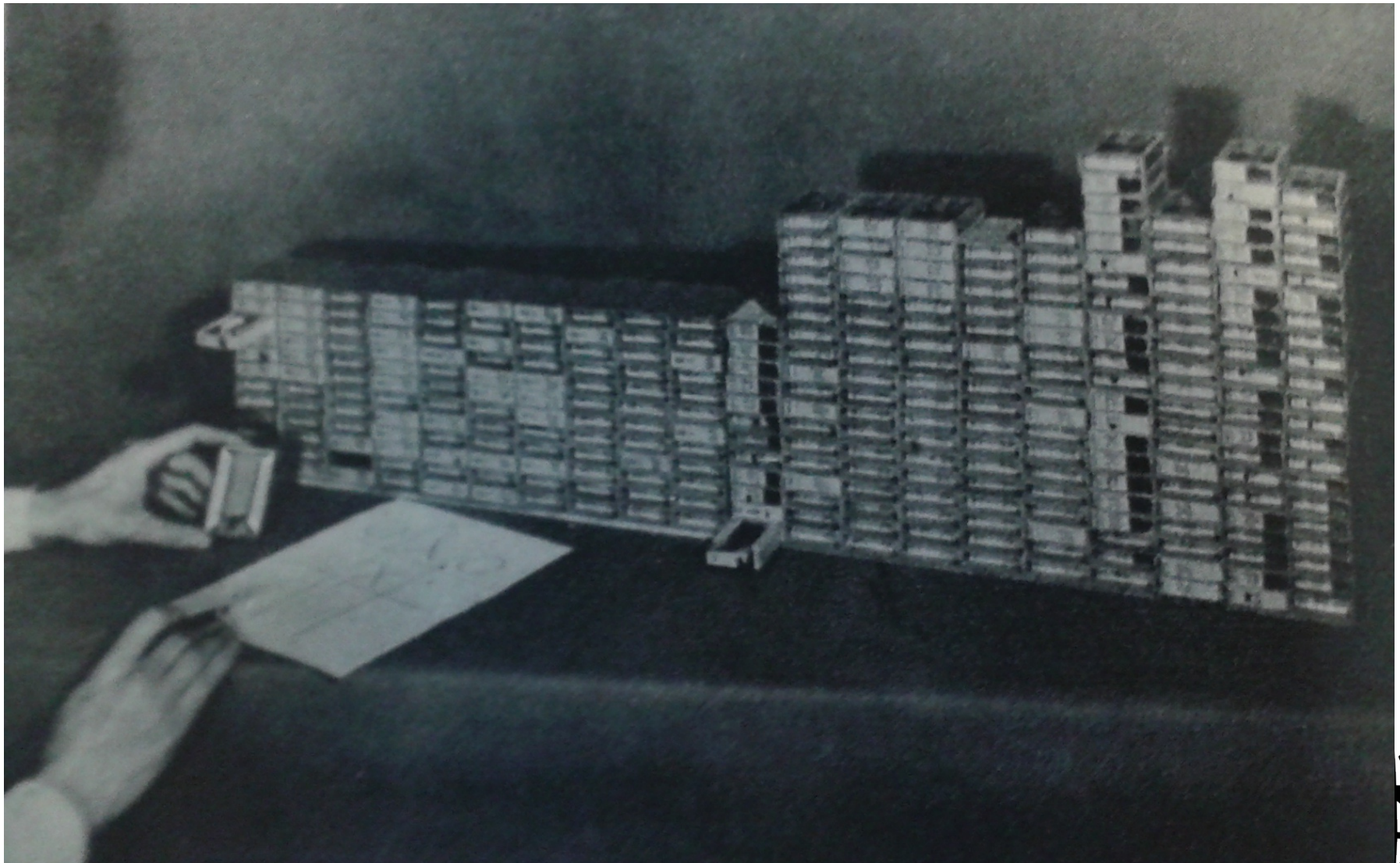
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Machine **E**ducable **N**oughts **A**nd **C**rosses **E**ngine

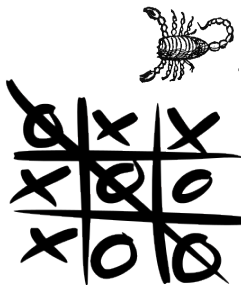
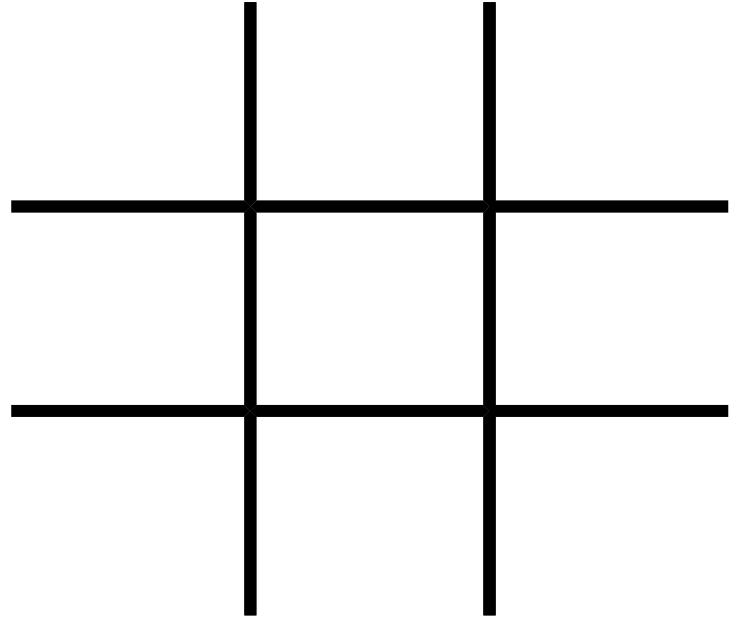


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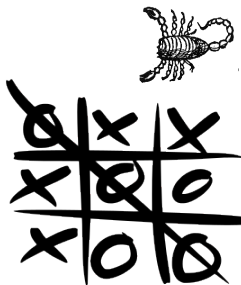
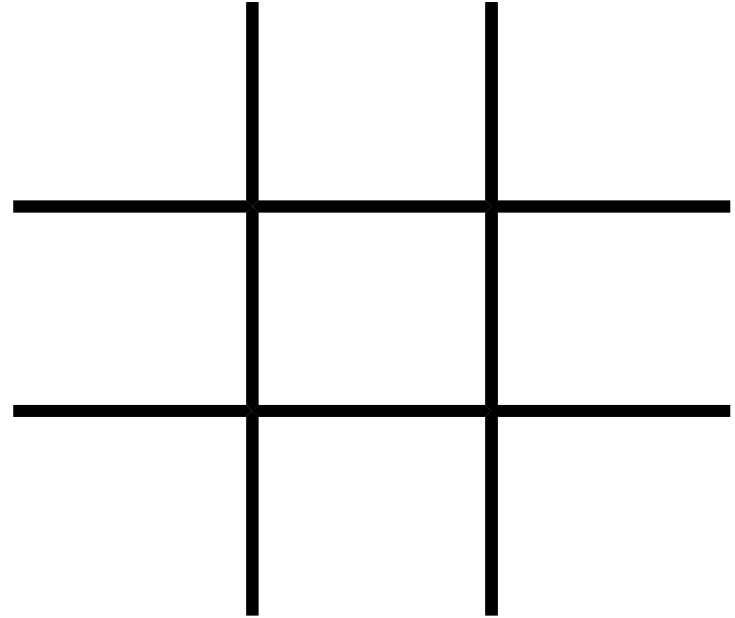
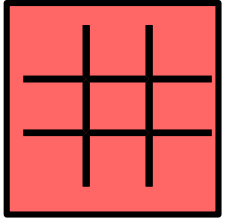
Machine Educable Noughts And Crosses Engine



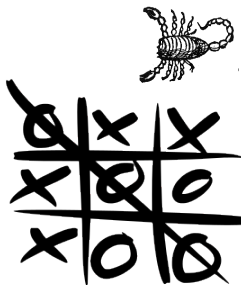
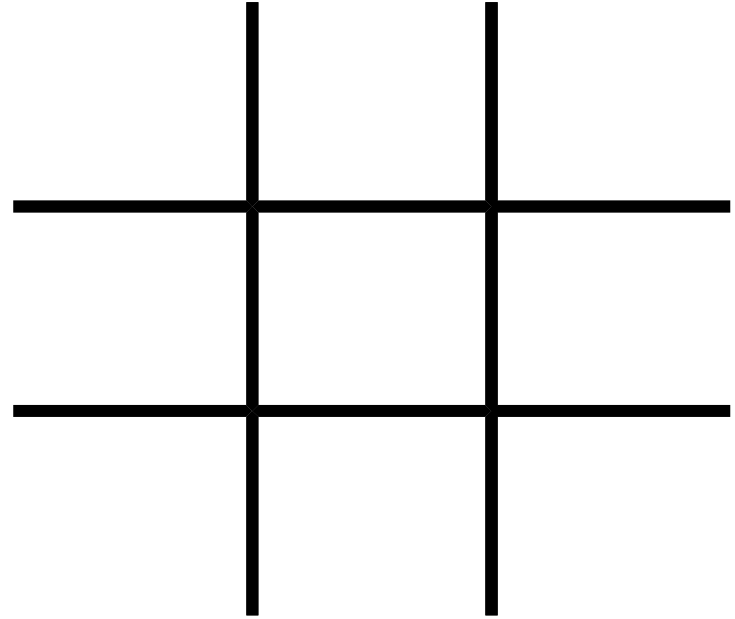
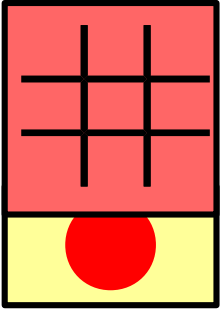
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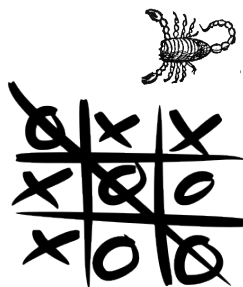
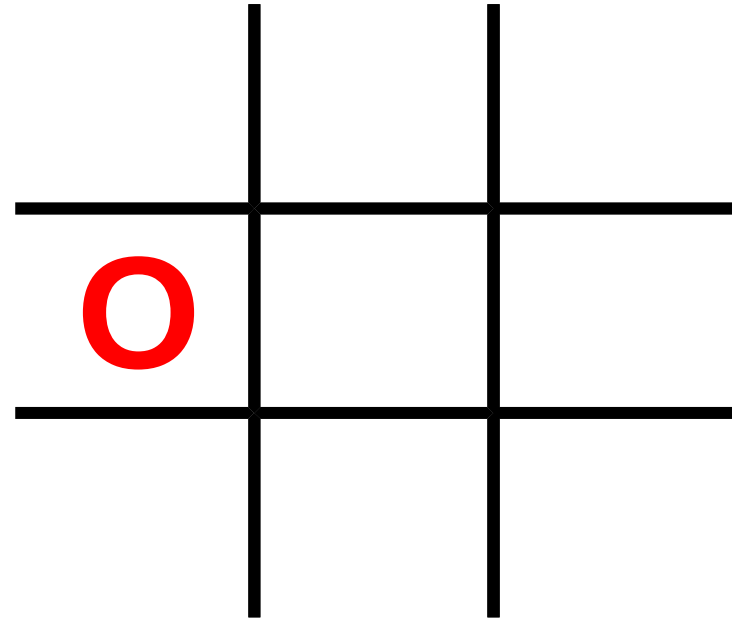
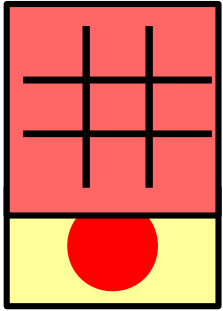
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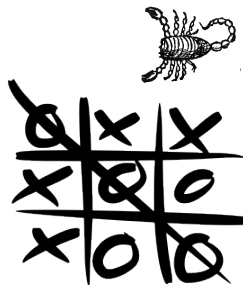
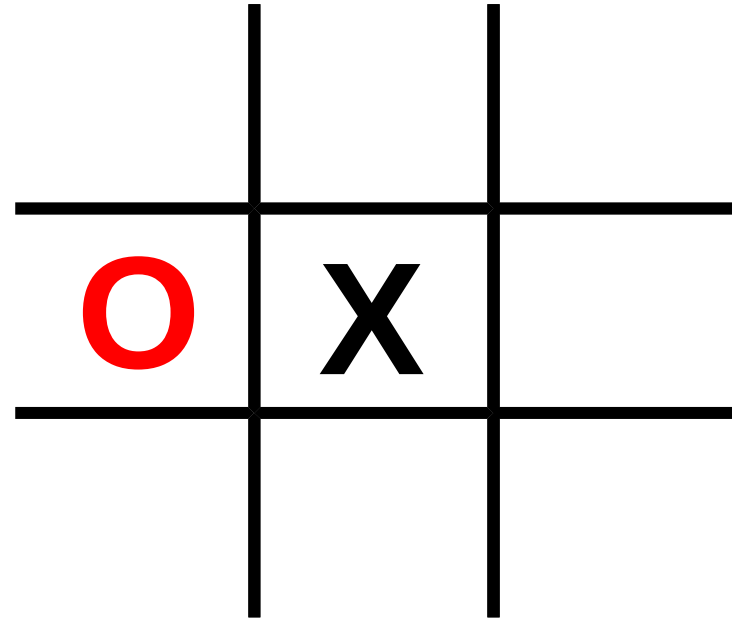
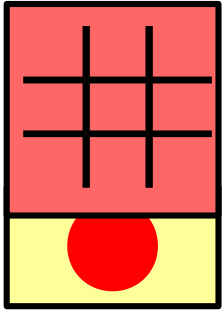
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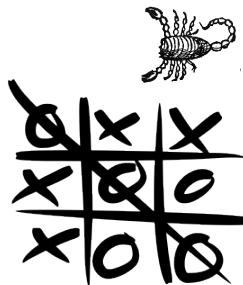
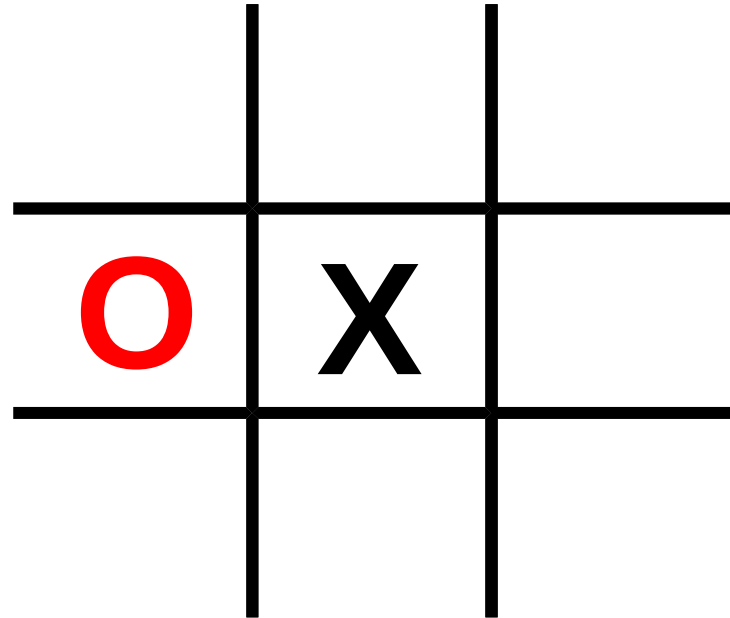
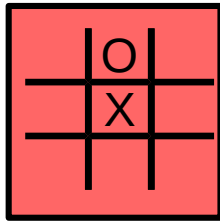
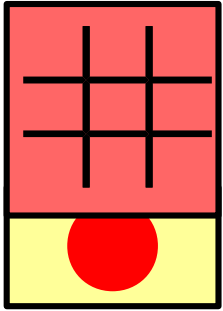
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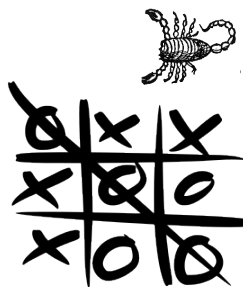
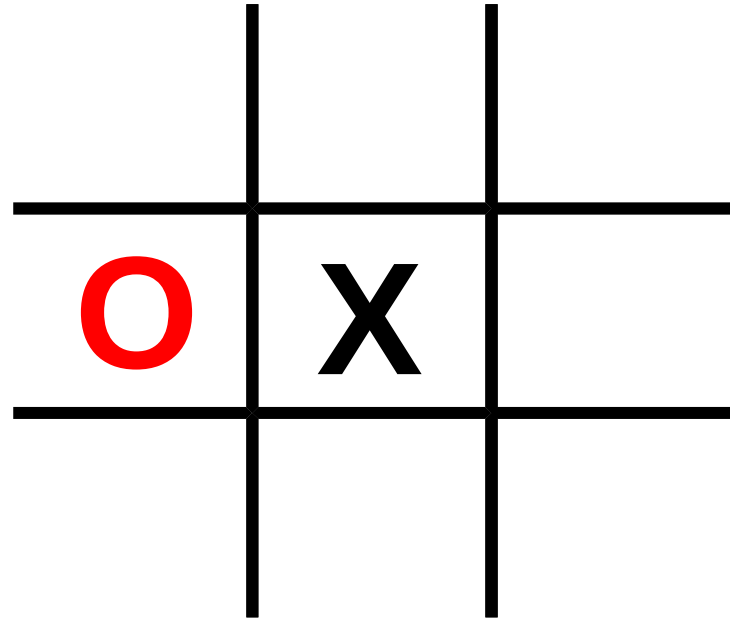
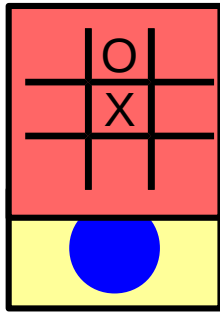
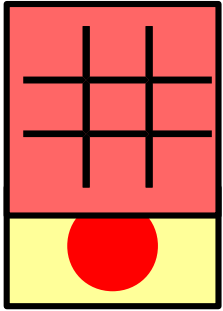
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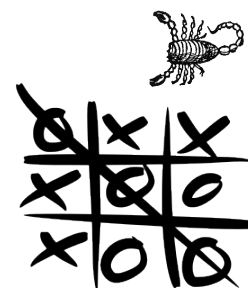
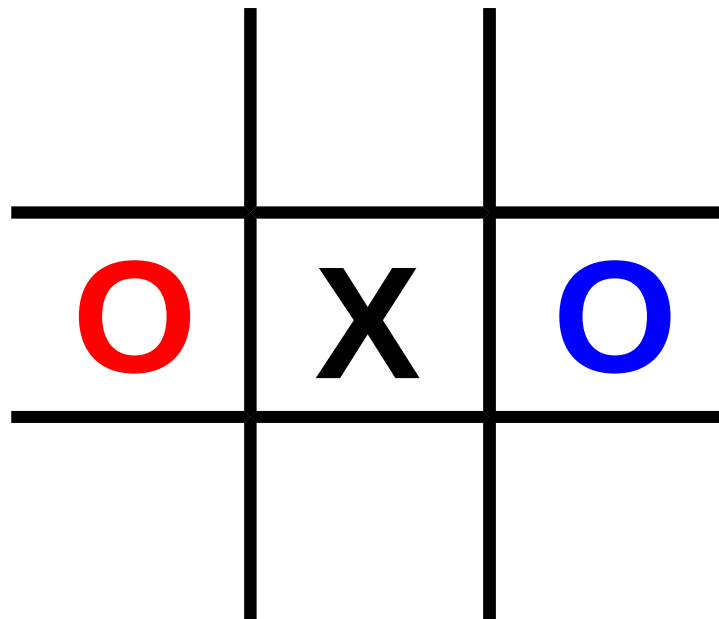
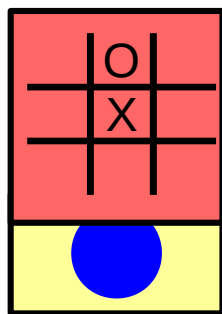
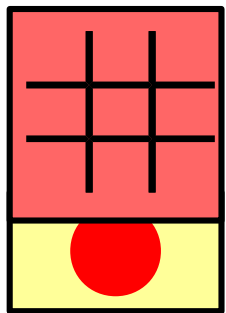
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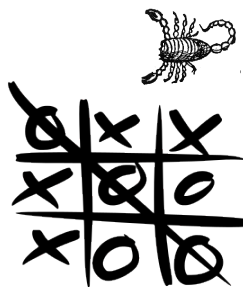
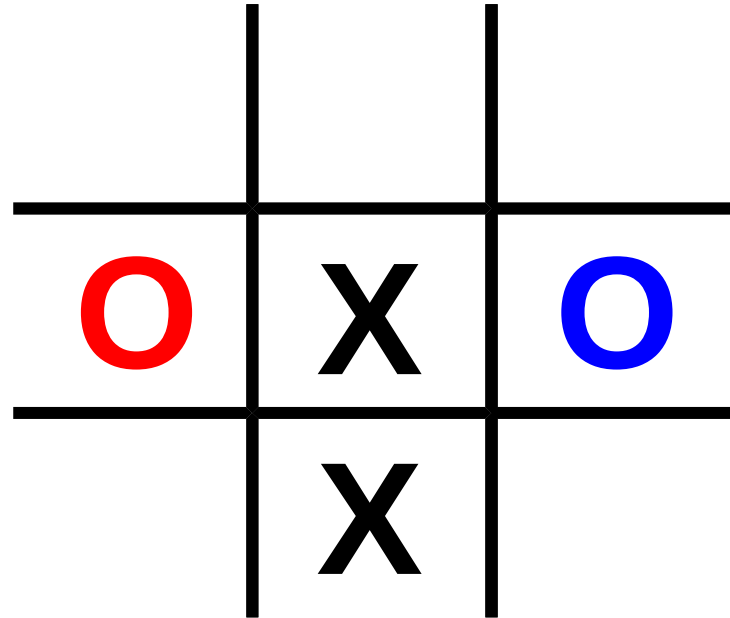
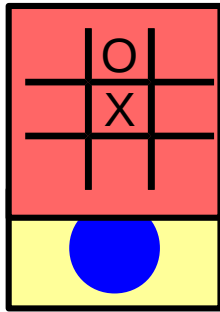
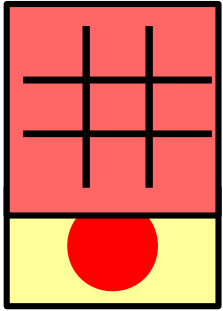
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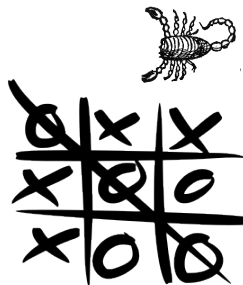
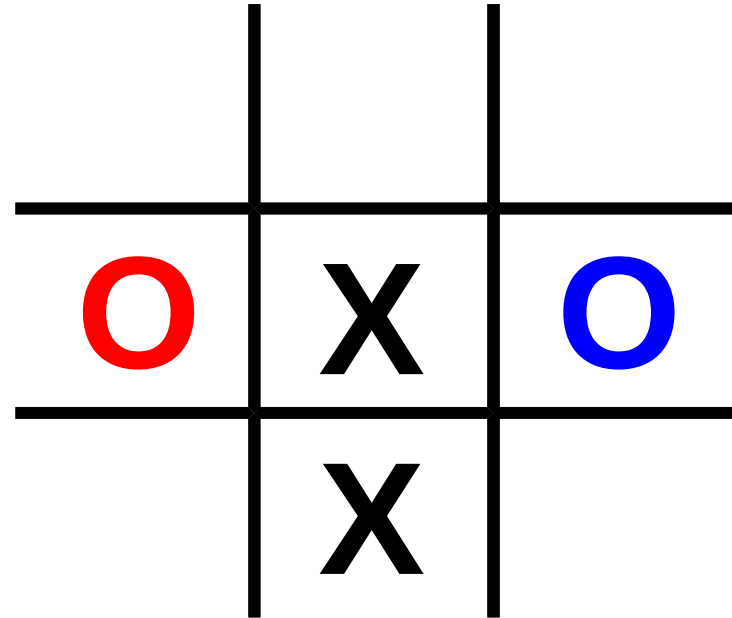
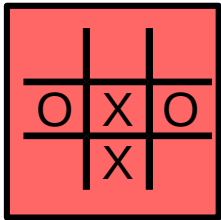
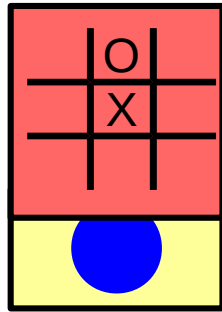
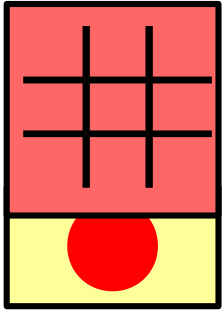
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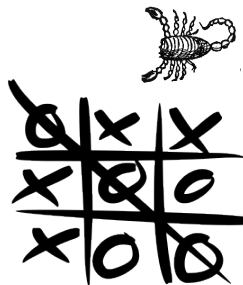
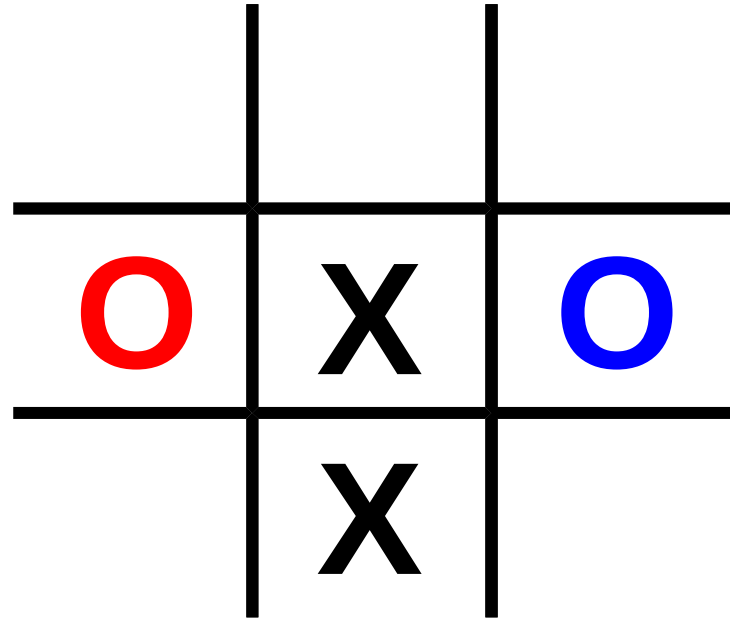
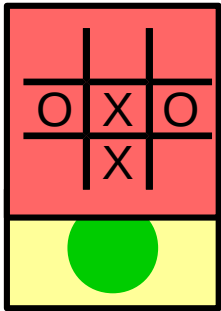
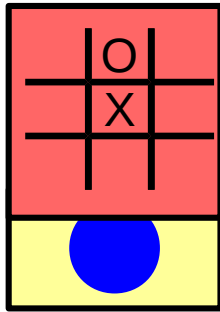
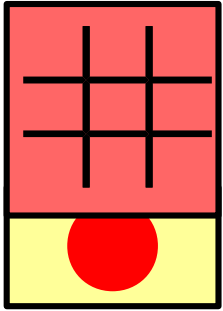
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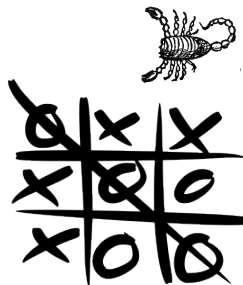
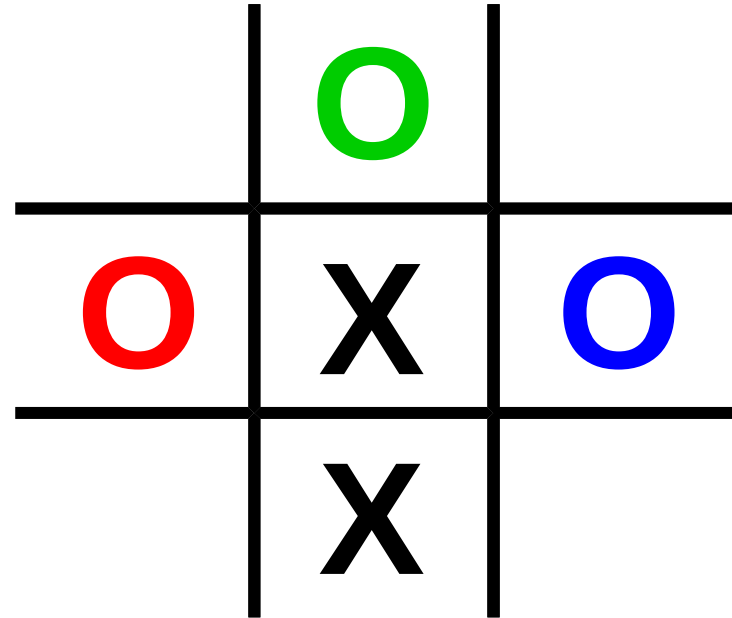
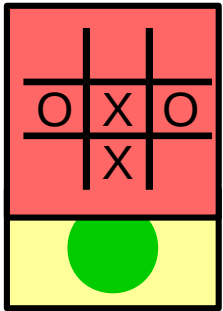
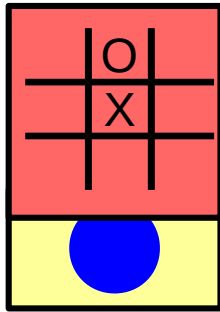
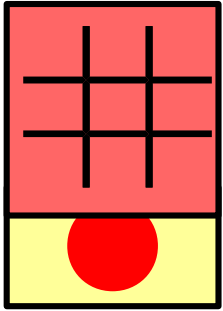
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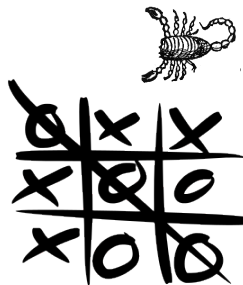
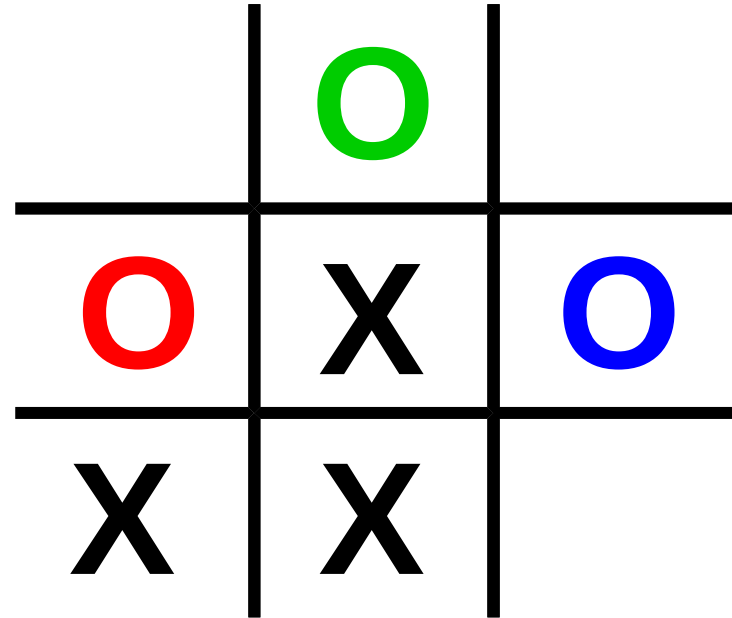
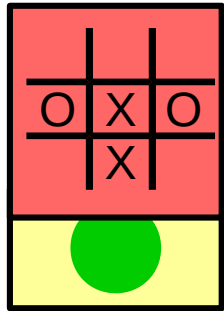
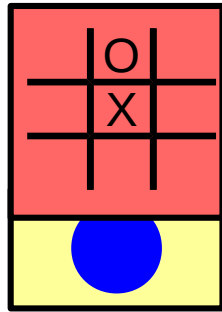
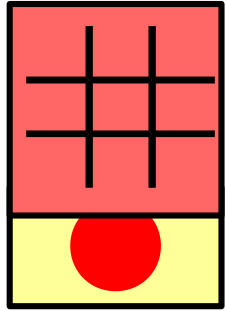
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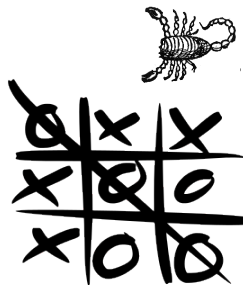
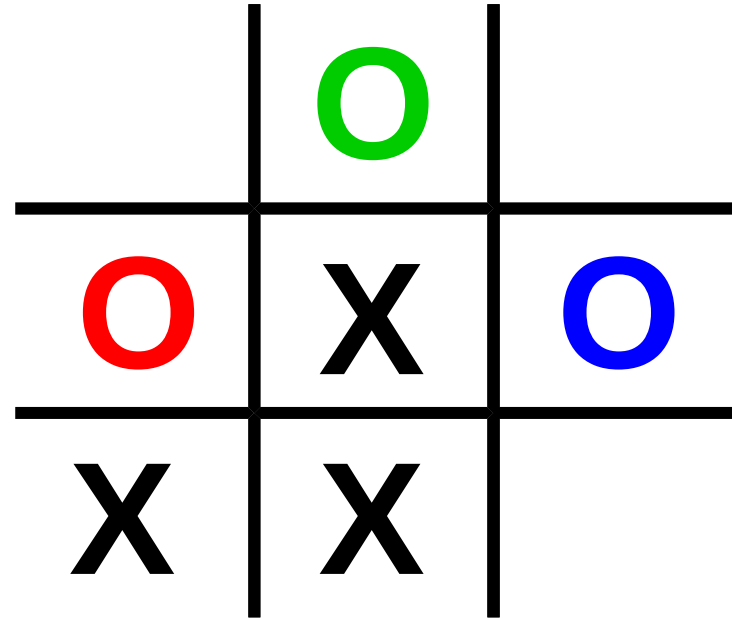
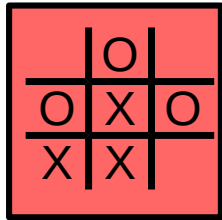
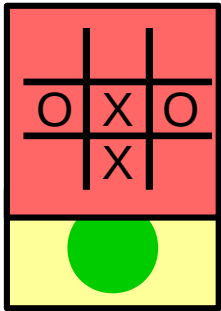
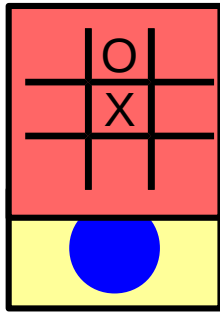
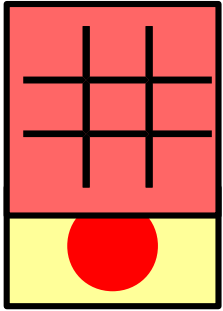
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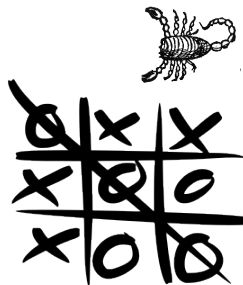
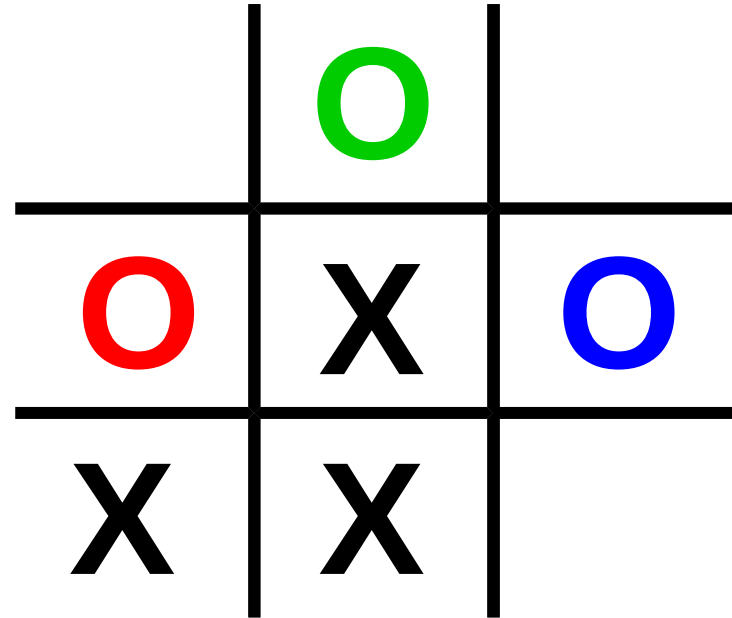
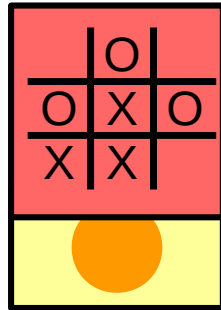
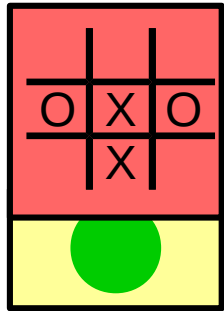
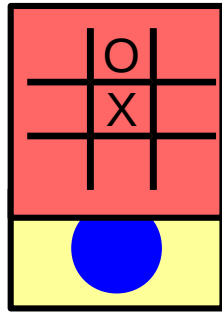
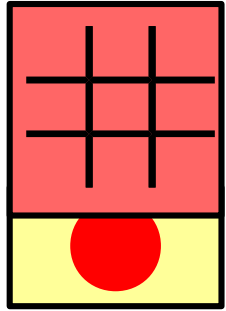
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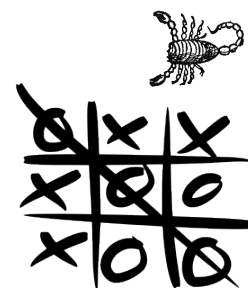
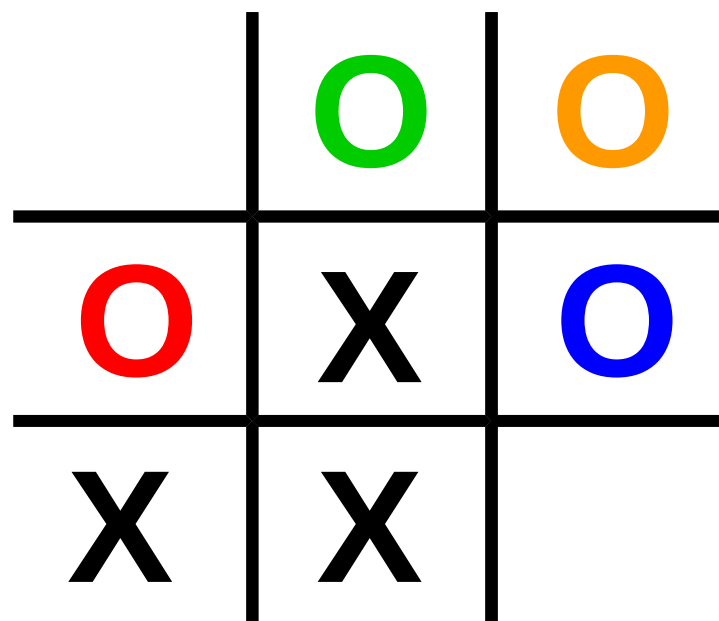
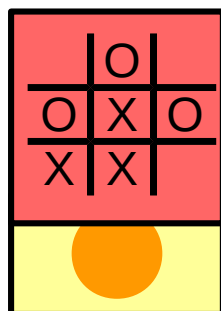
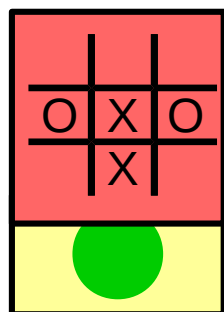
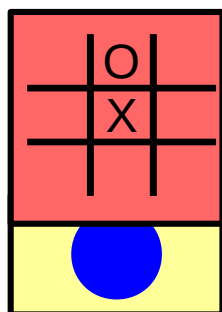
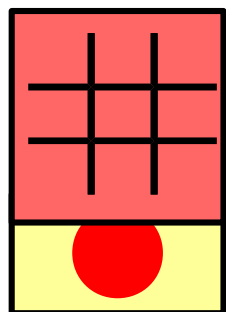
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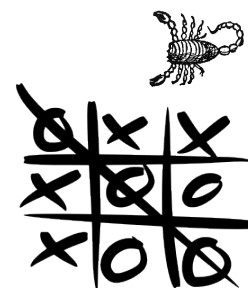
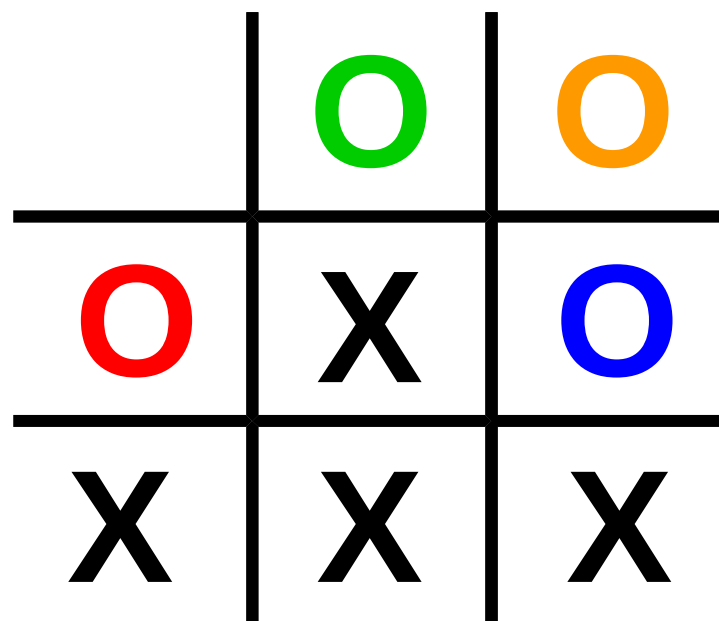
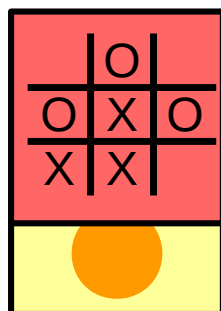
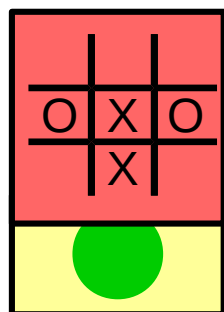
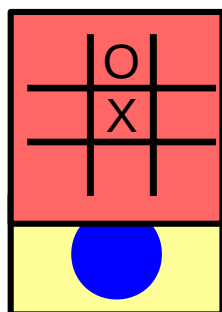
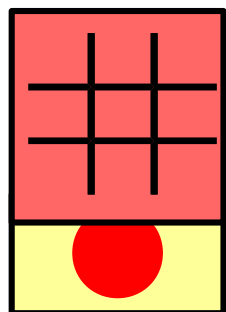
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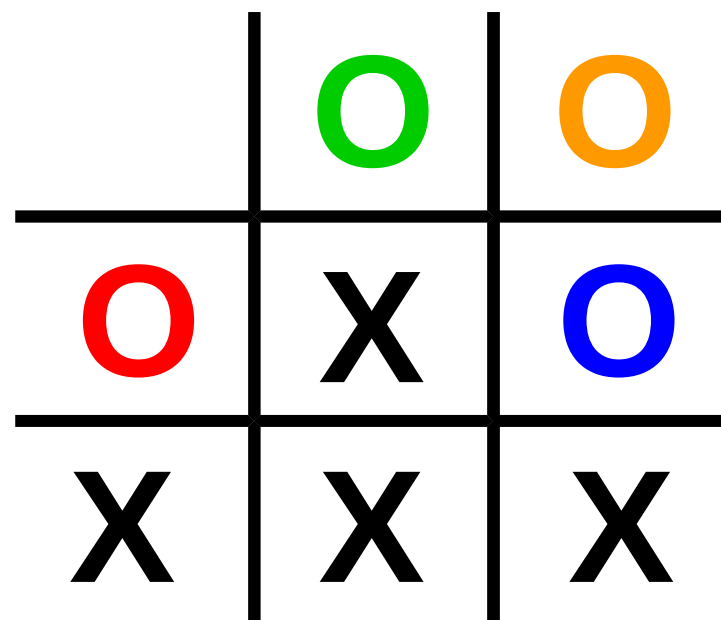
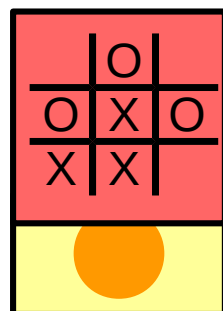
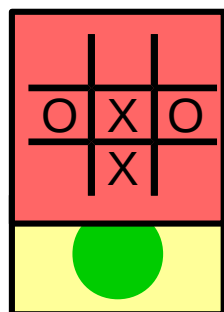
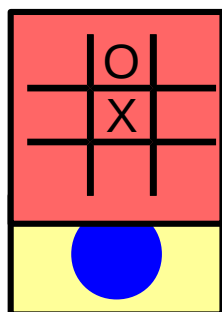
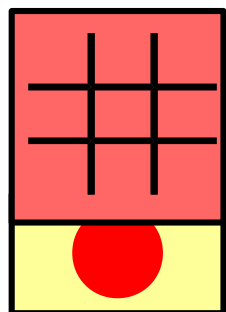
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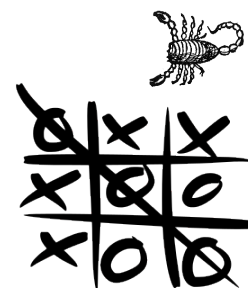
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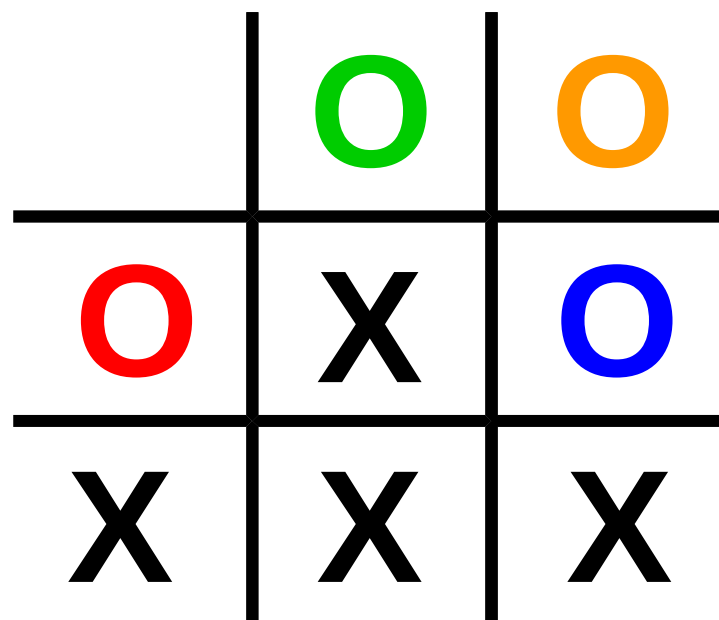
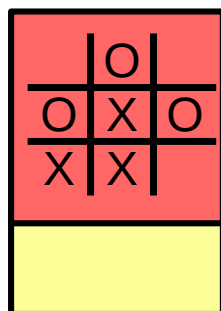
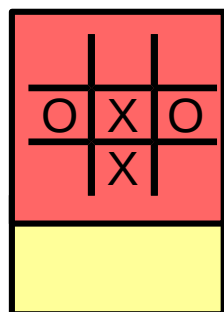
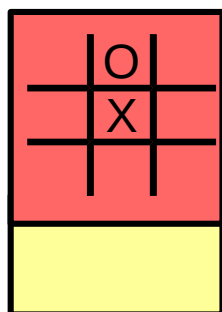
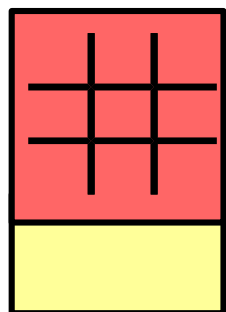
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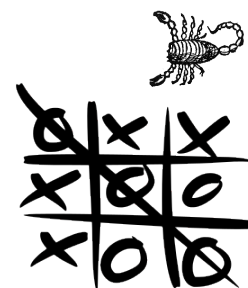
Lose → -1 bead



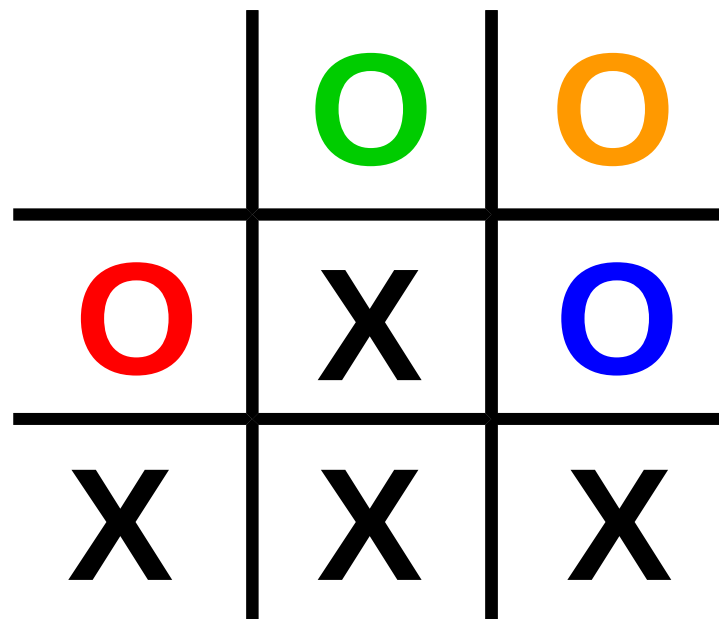
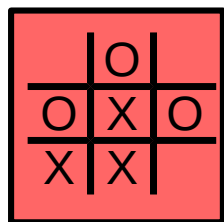
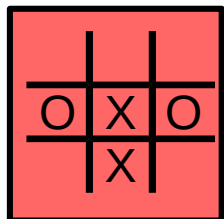
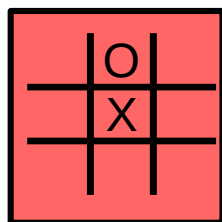
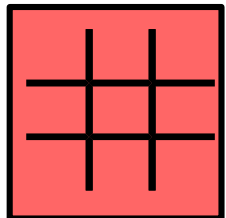
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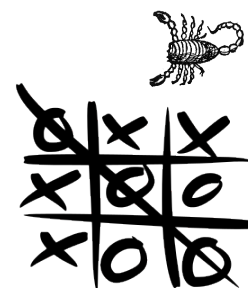
Lose → -1 bead



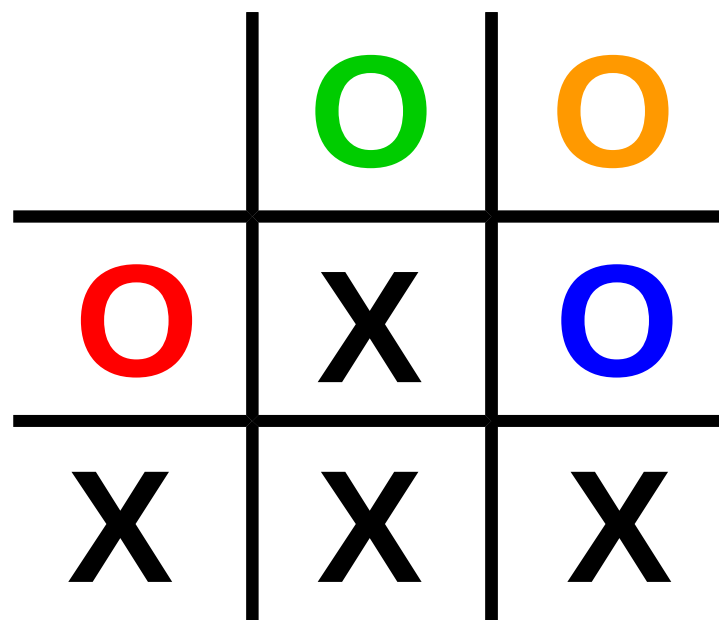
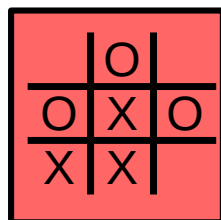
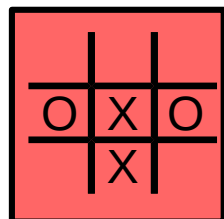
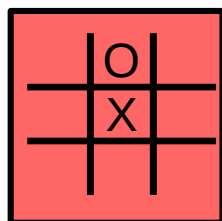
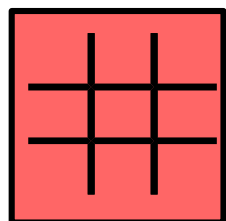
MENACE



Lose → -1 bead

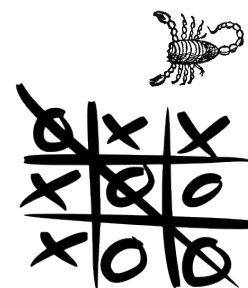


MENACE

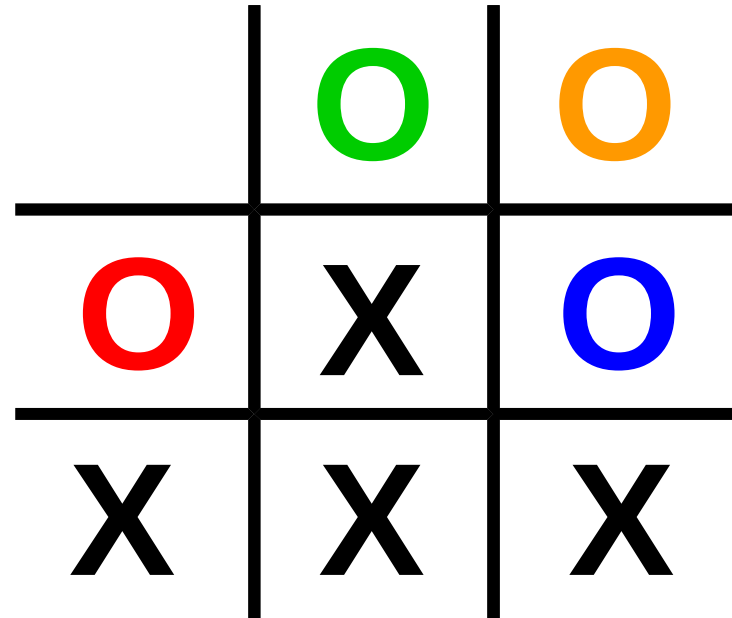
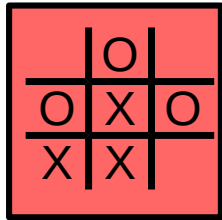
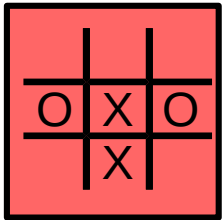
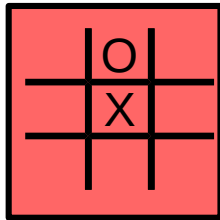
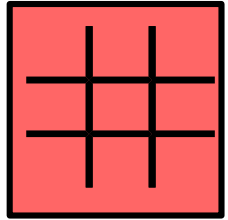


Lose → -1 bead

Win → +3 beads



MENACE



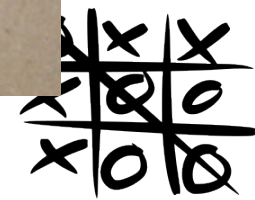
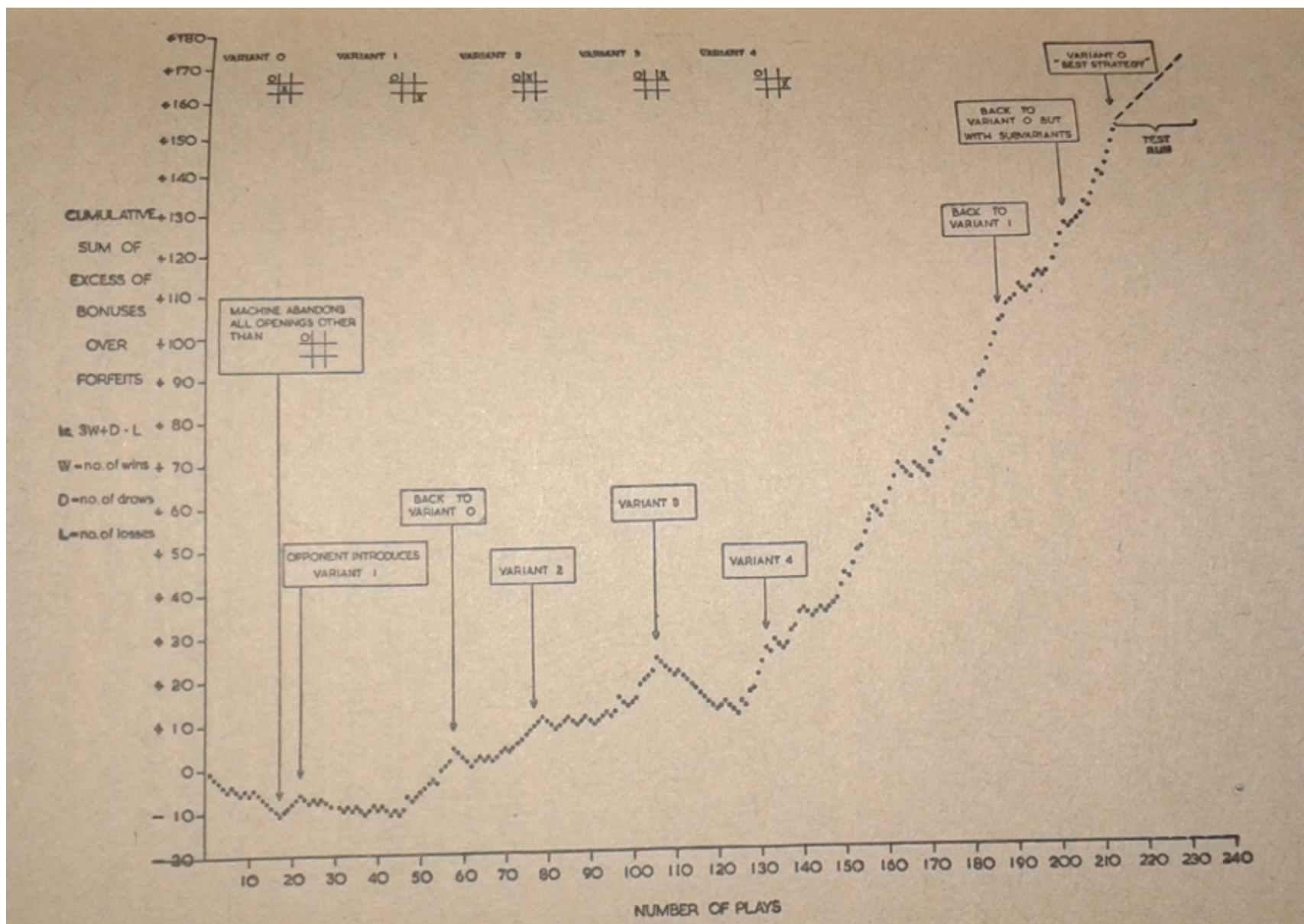
Lose → -1 bead

Win → +3 beads

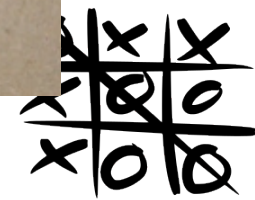
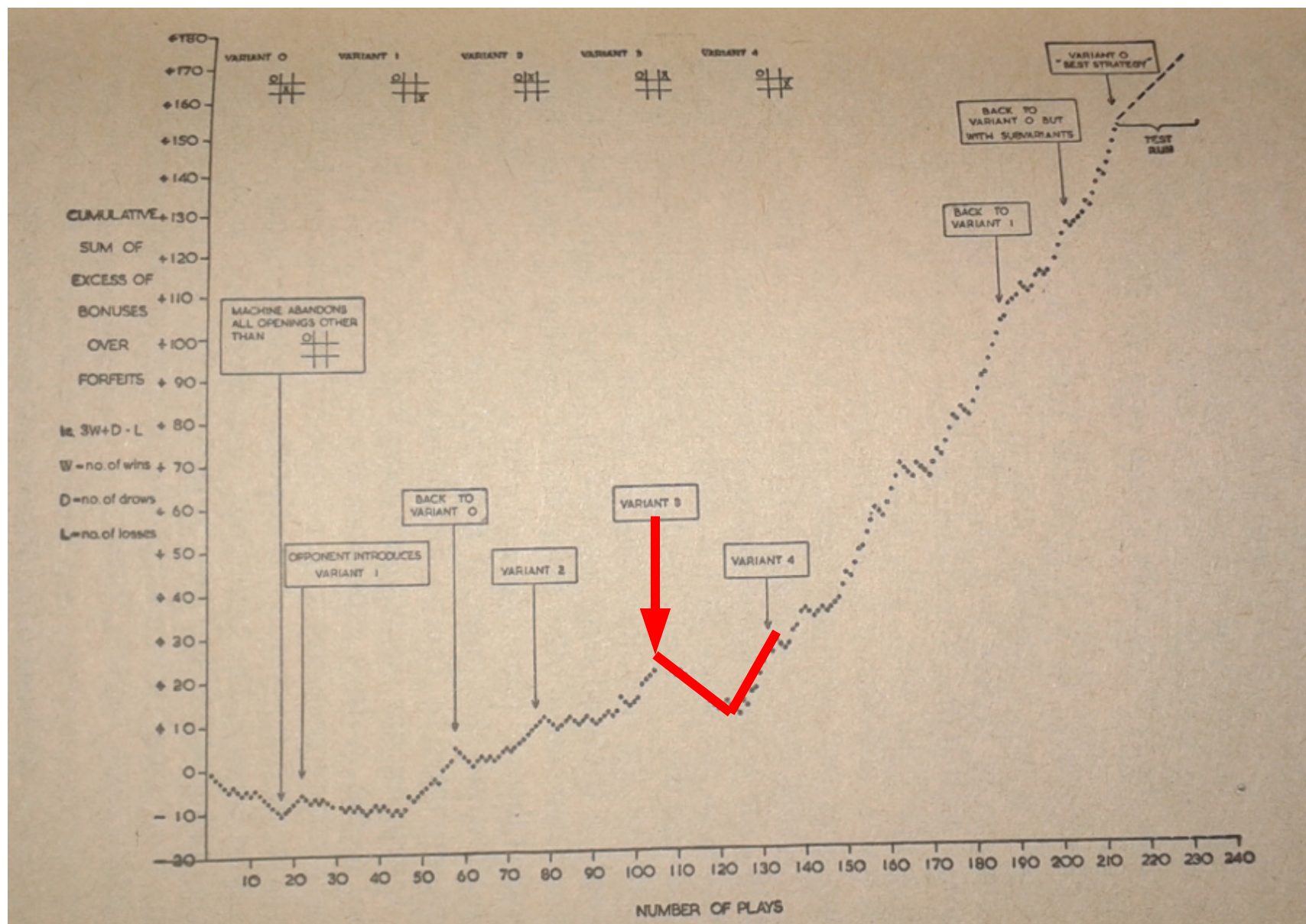
Draw → +1 bead



MENACE



MENACE



Connect 4



Connect 4

- 4 531 985 219 092 possible positions



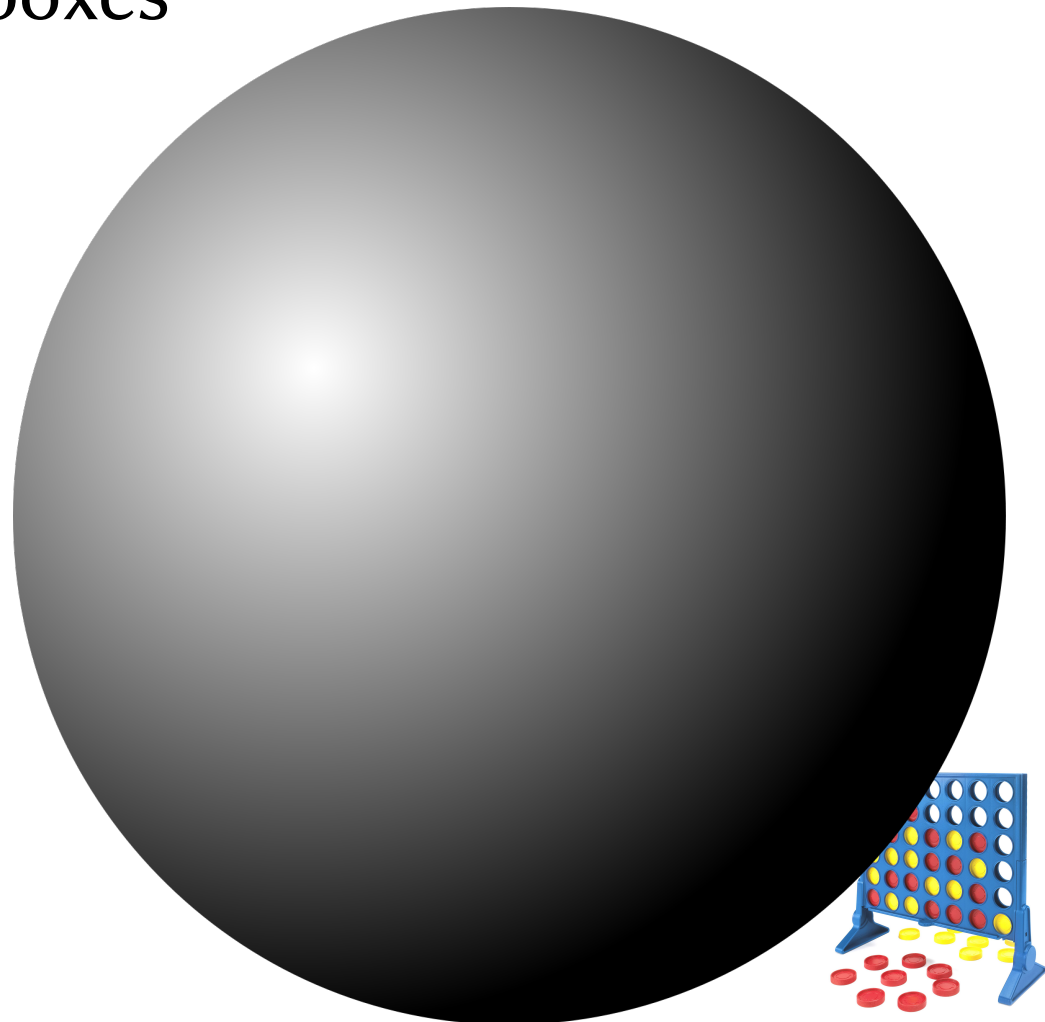
Connect 4

- 4 531 985 219 092 possible positions
- 104 371 619m³ of matchboxes



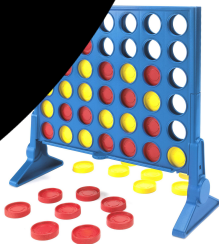
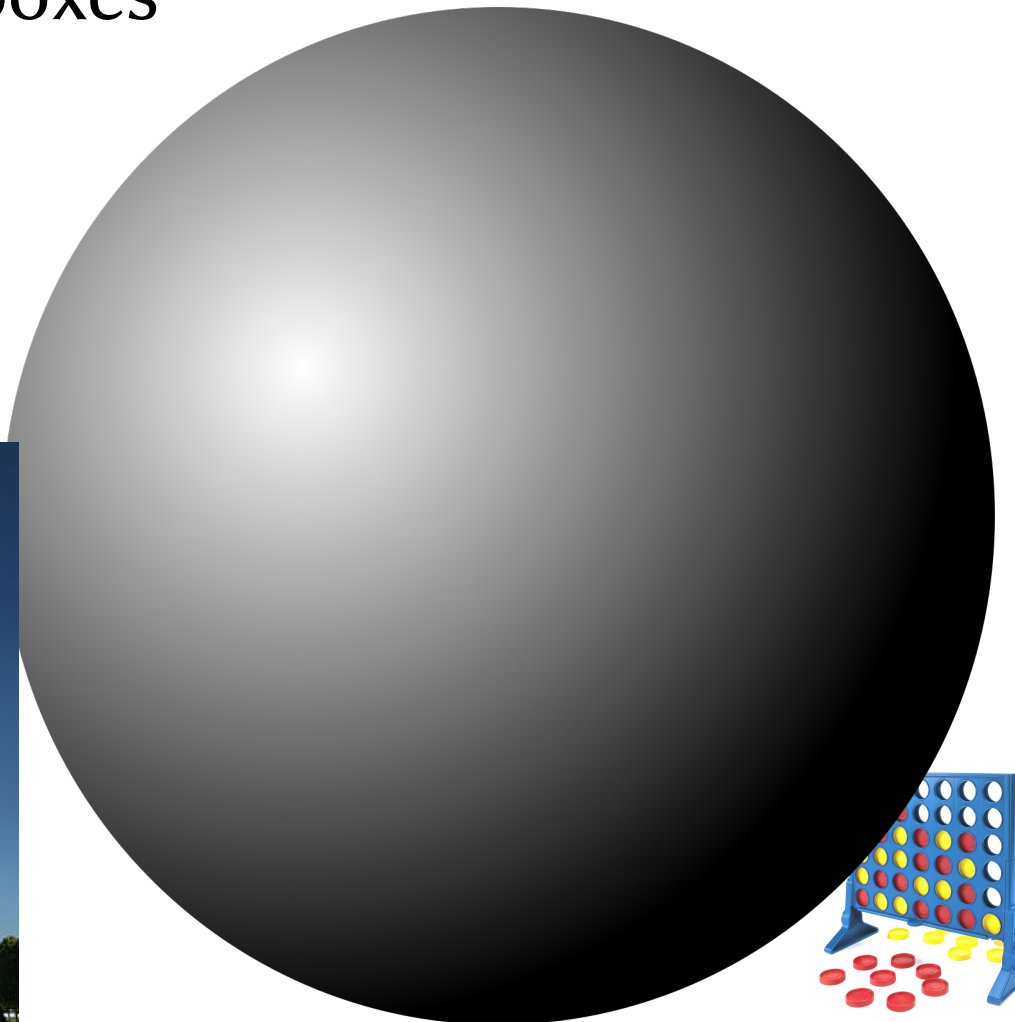
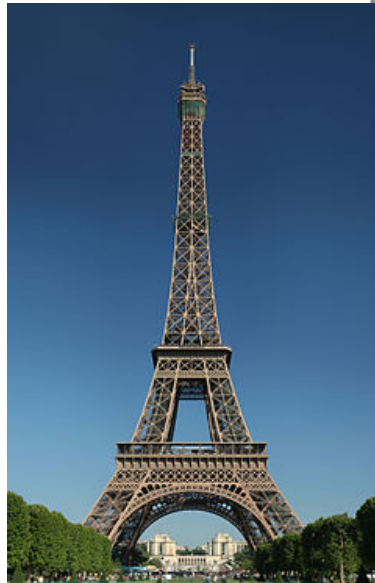
Connect 4

- 4 531 985 219 092 possible positions
- 104 371 619m³ of matchboxes



Connect 4

- 4 531 985 219 092 possible positions
- 104 371 619m³ of matchboxes



Chess



Chess

- Around 10^{43} possible positions



Chess

- Around 10^{43} possible positions
- Around 10^{38}m^3 of matchboxes



Chess

- Around 10^{43} possible positions
- Around 10^{38}m^3 of matchboxes



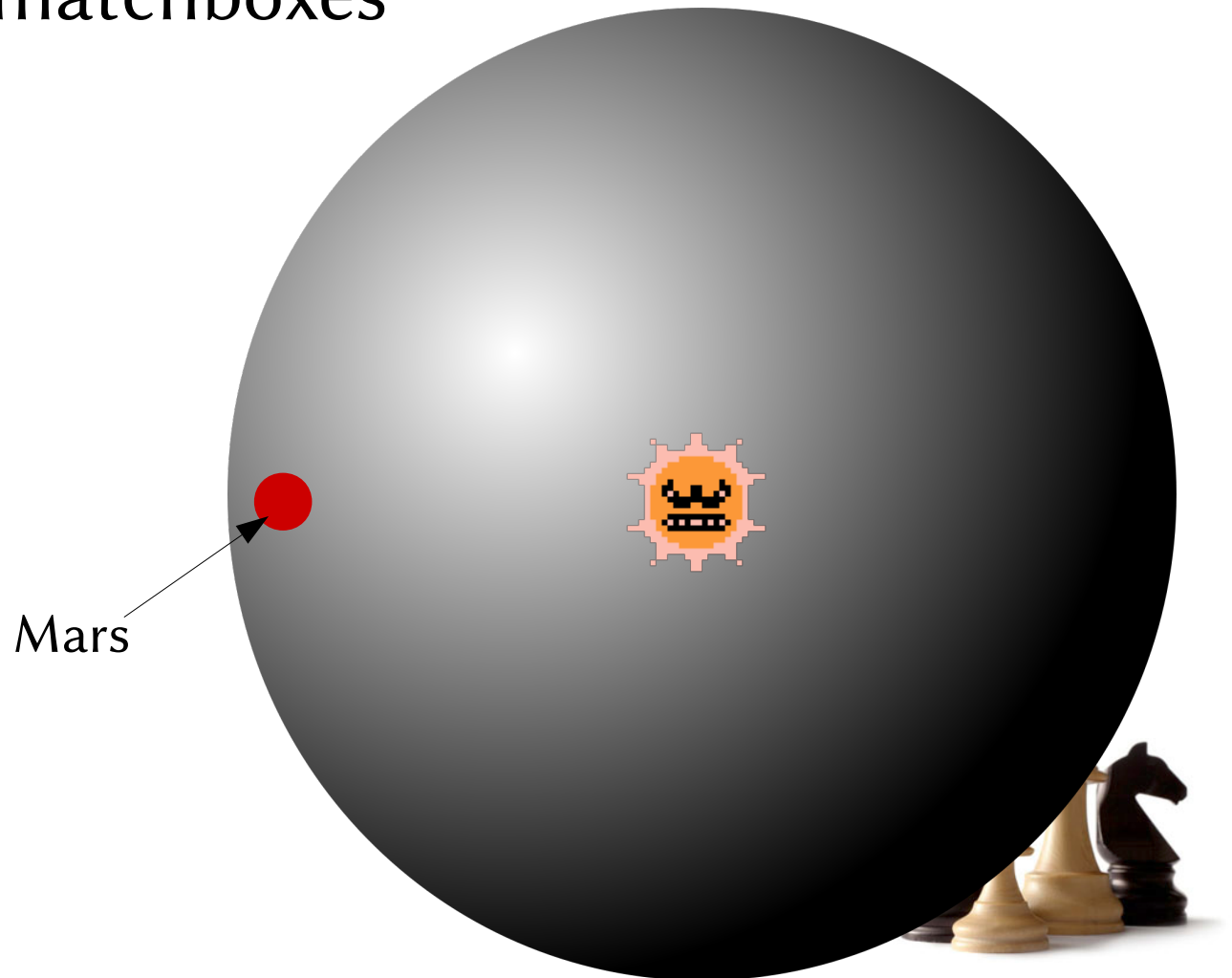
Chess

- Around 10^{43} possible positions
- Around 10^{38}m^3 of matchboxes

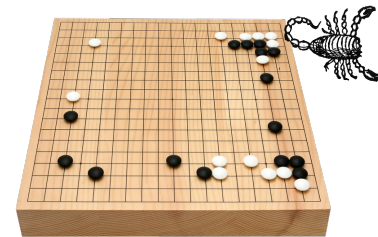


Chess

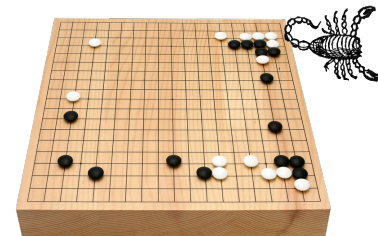
- Around 10^{43} possible positions
- Around 10^{38}m^3 of matchboxes



Go (19 by 19)

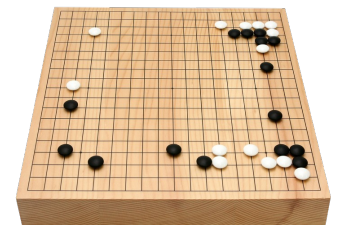


Go (19 by 19)



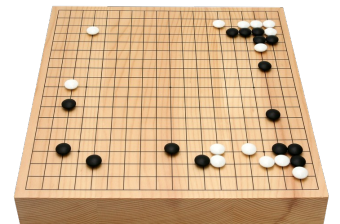
Go (19 by 19)

- Estimated 10^{170} possible positions



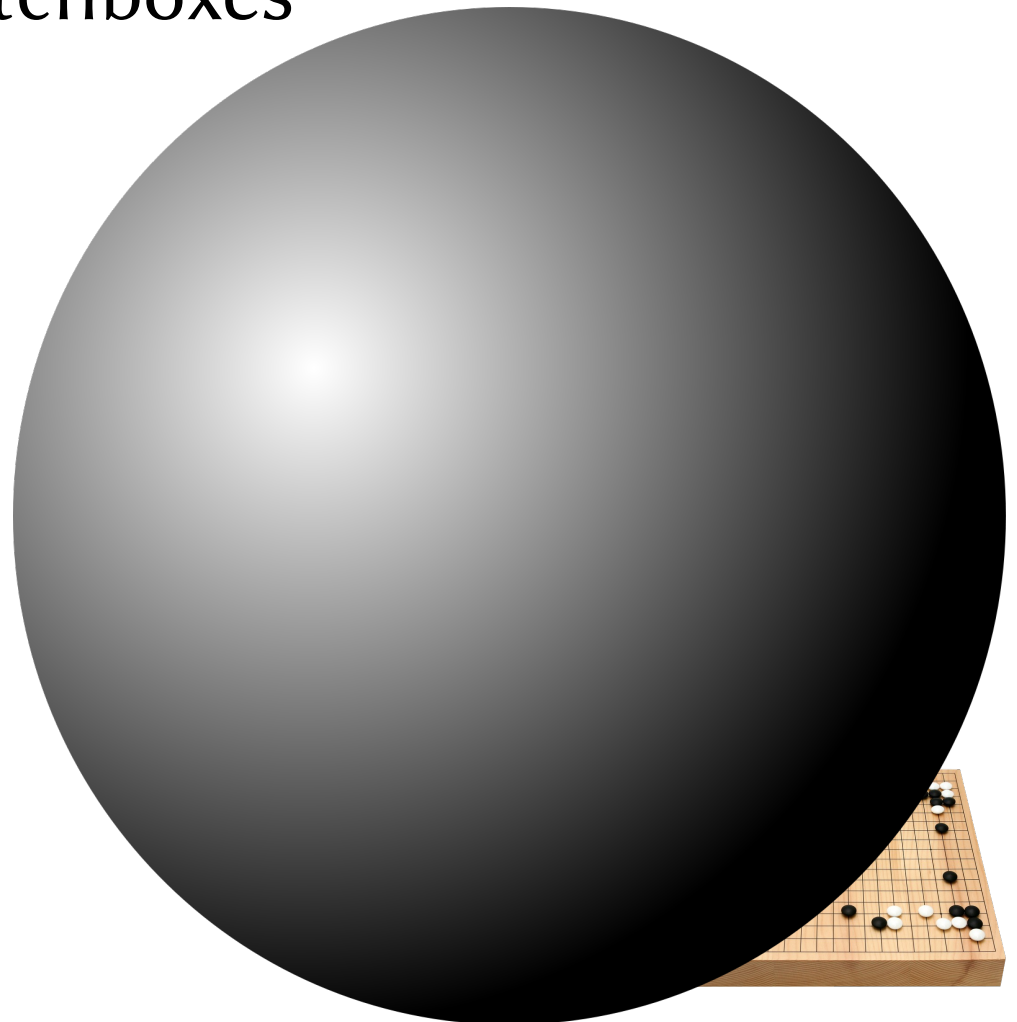
Go (19 by 19)

- Estimated 10^{170} possible positions
- Estimated 10^{165}m^3 of matchboxes



Go (19 by 19)

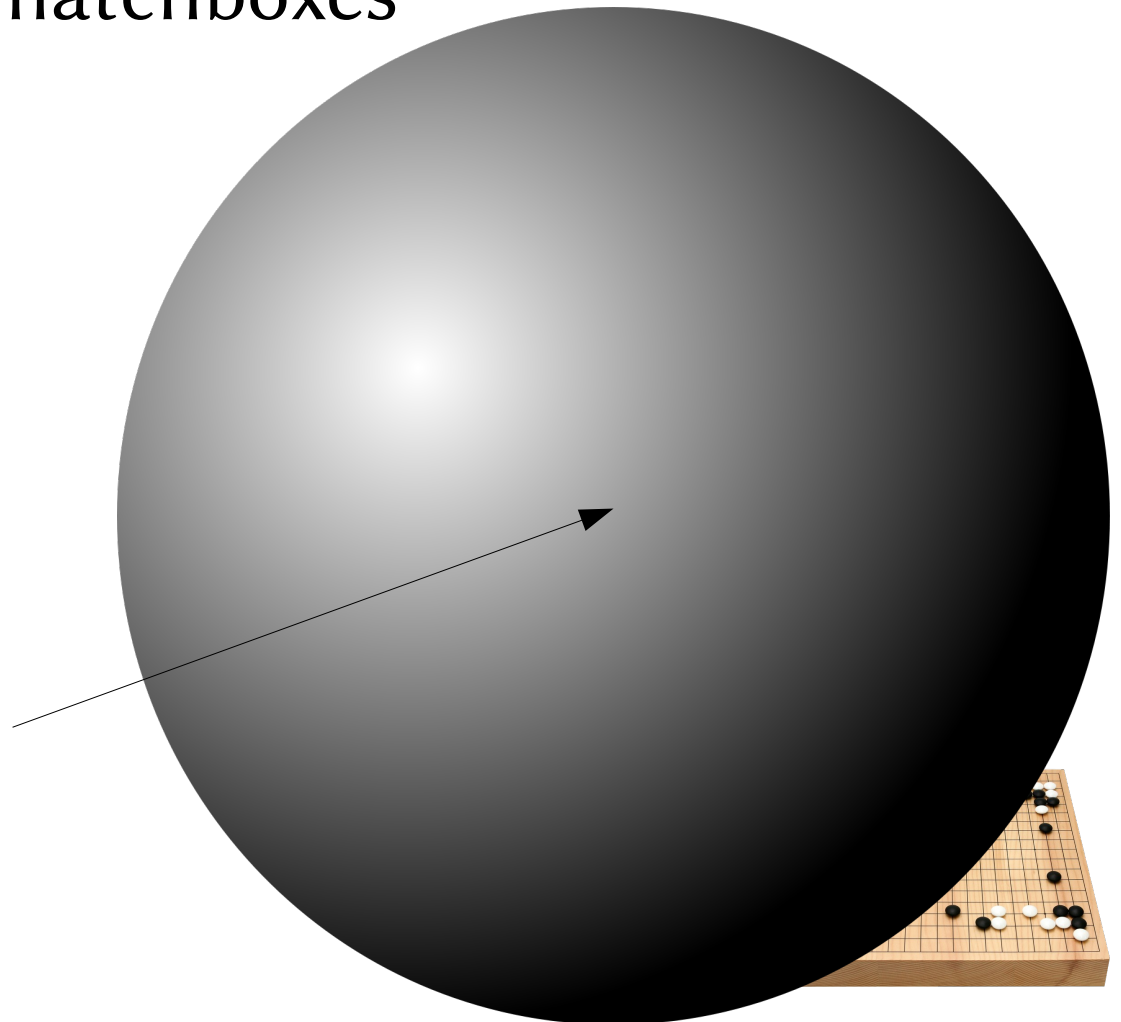
- Estimated 10^{170} possible positions
- Estimated 10^{165}m^3 of matchboxes



Go (19 by 19)

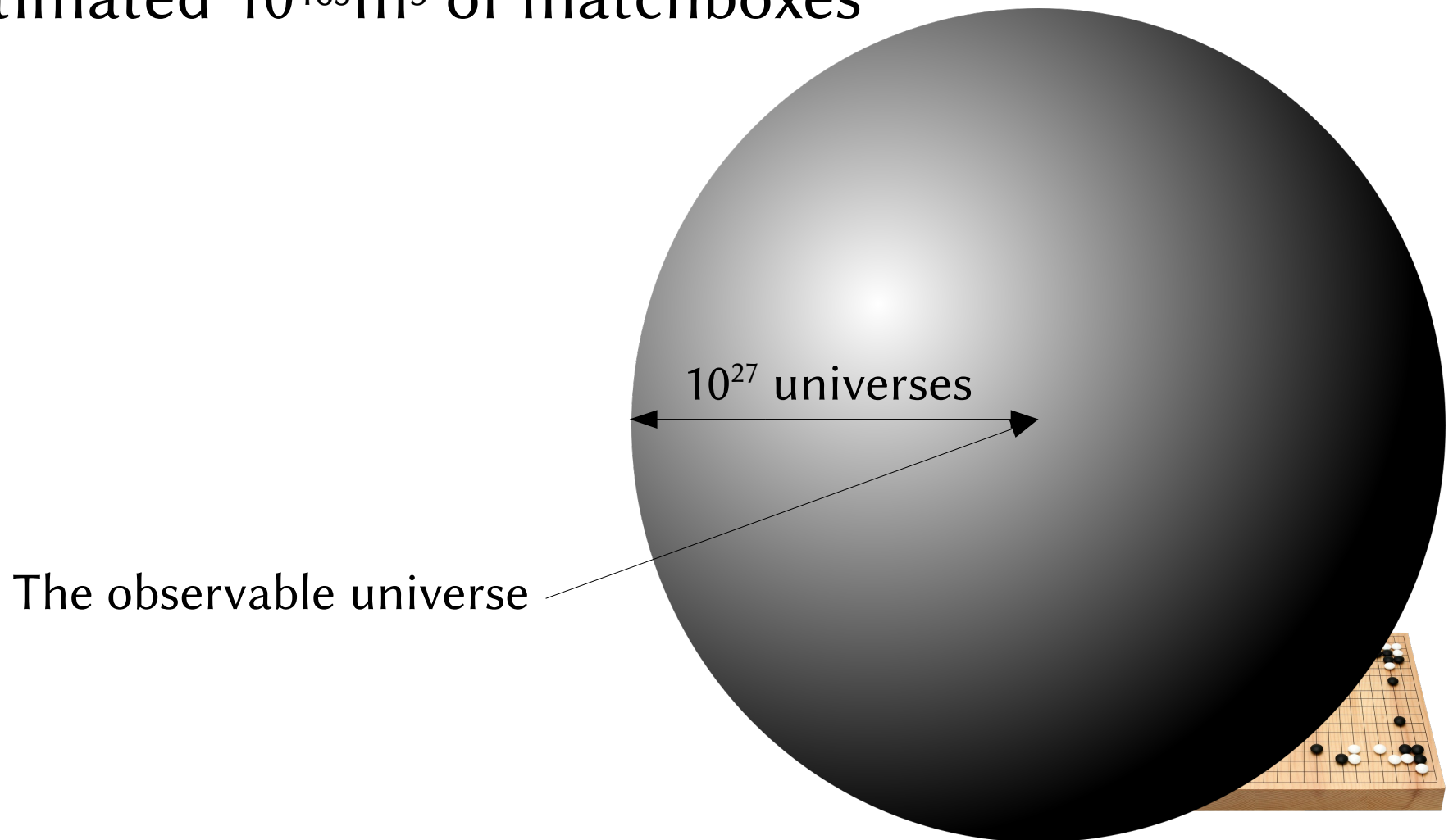
- Estimated 10^{170} possible positions
- Estimated 10^{165}m^3 of matchboxes

The observable universe

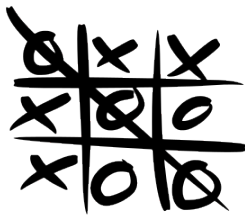


Go (19 by 19)

- Estimated 10^{170} possible positions
- Estimated 10^{165}m^3 of matchboxes



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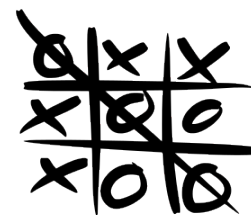
X: Human

1

0

4

You win.

[illegible]



Thank-you for listening!

Matthew Scroggs



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