

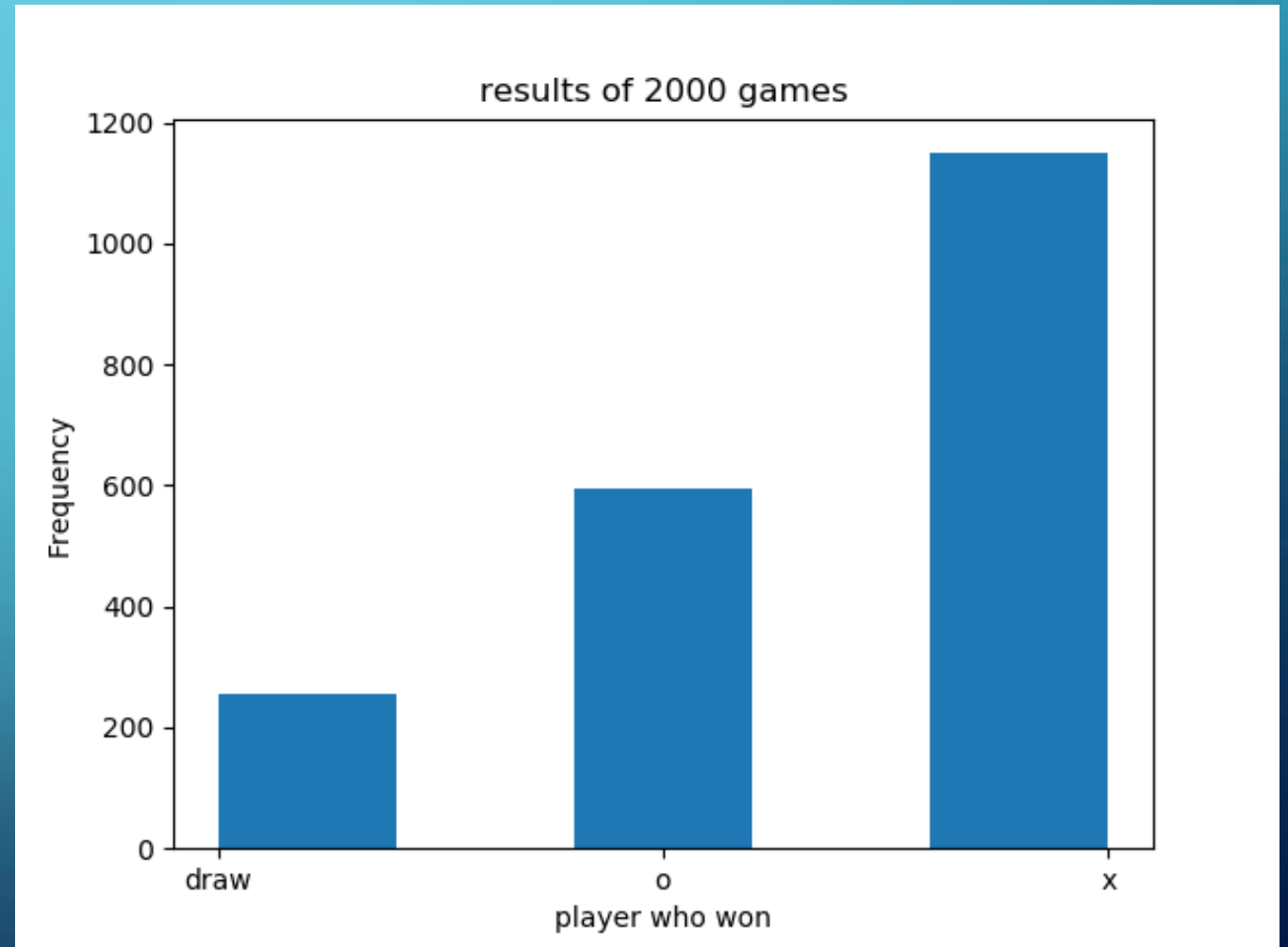
A decorative graphic on the left side of the slide, consisting of a network of white lines and circles on a blue gradient background, resembling a circuit board or a neural network.

GAME AI PROJECT 1

SIMON BOTH

TIC TAC TOE RANDOM MOVES

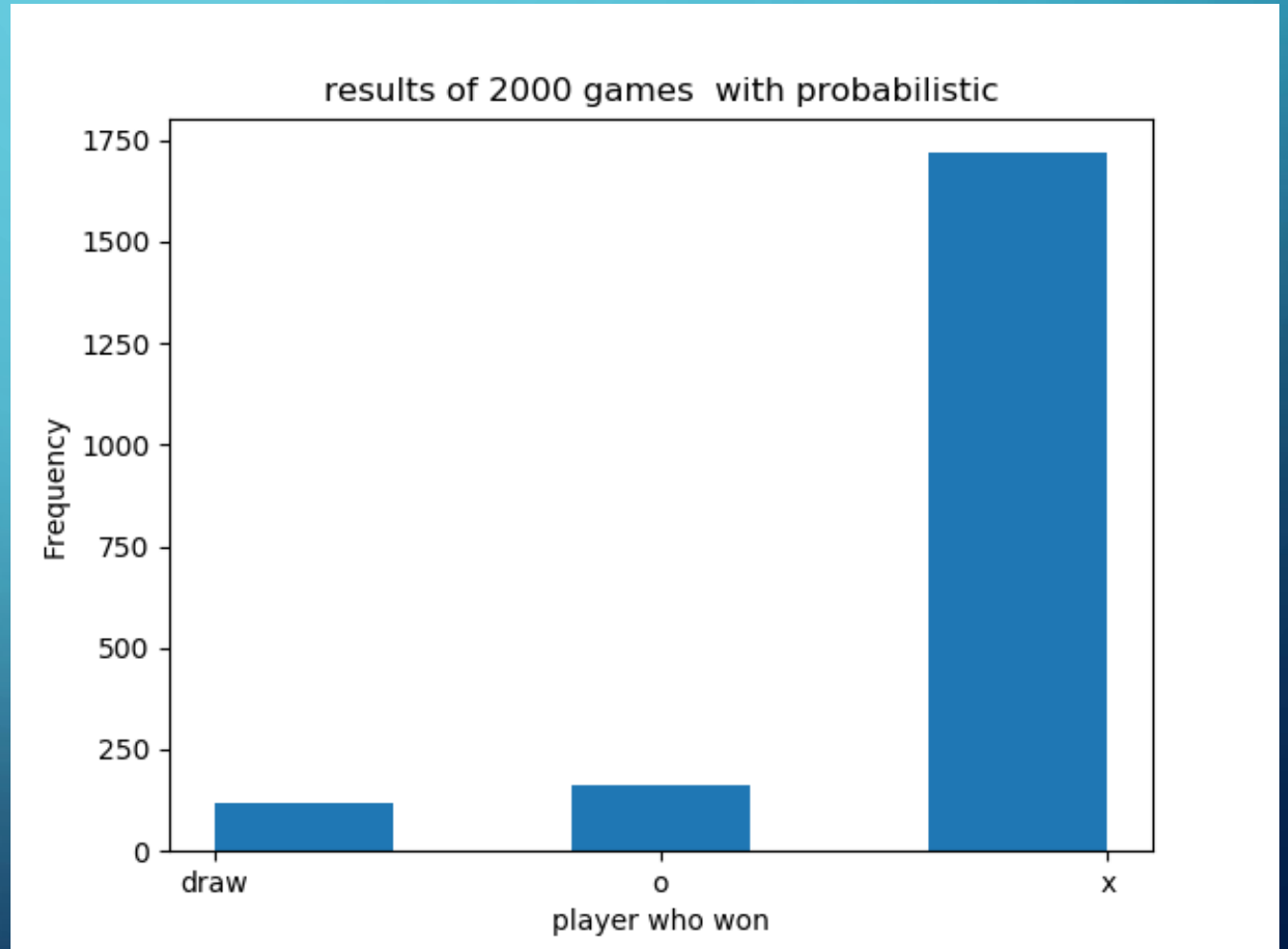
Player x moves first



TIC TAC TOE BASED ON PROBABILITY MATRIX

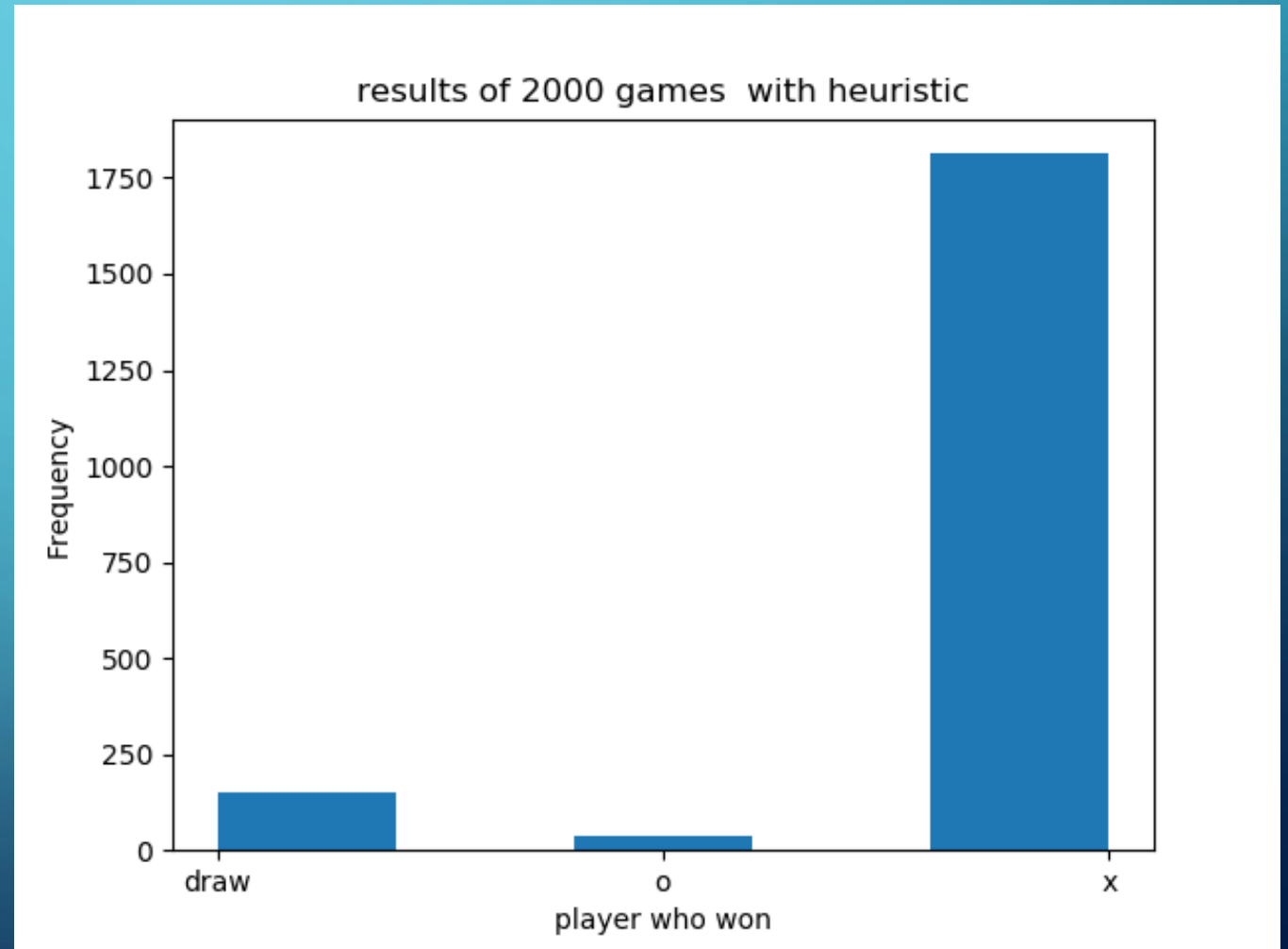
Probability of position
in a *win* for player x

```
[[ 0.115  0.107  0.12 ]  
 [ 0.095  0.138  0.1  ]  
 [ 0.116  0.092  0.116]]
```



TIC TAC TOE BASED ON HEURISTIC

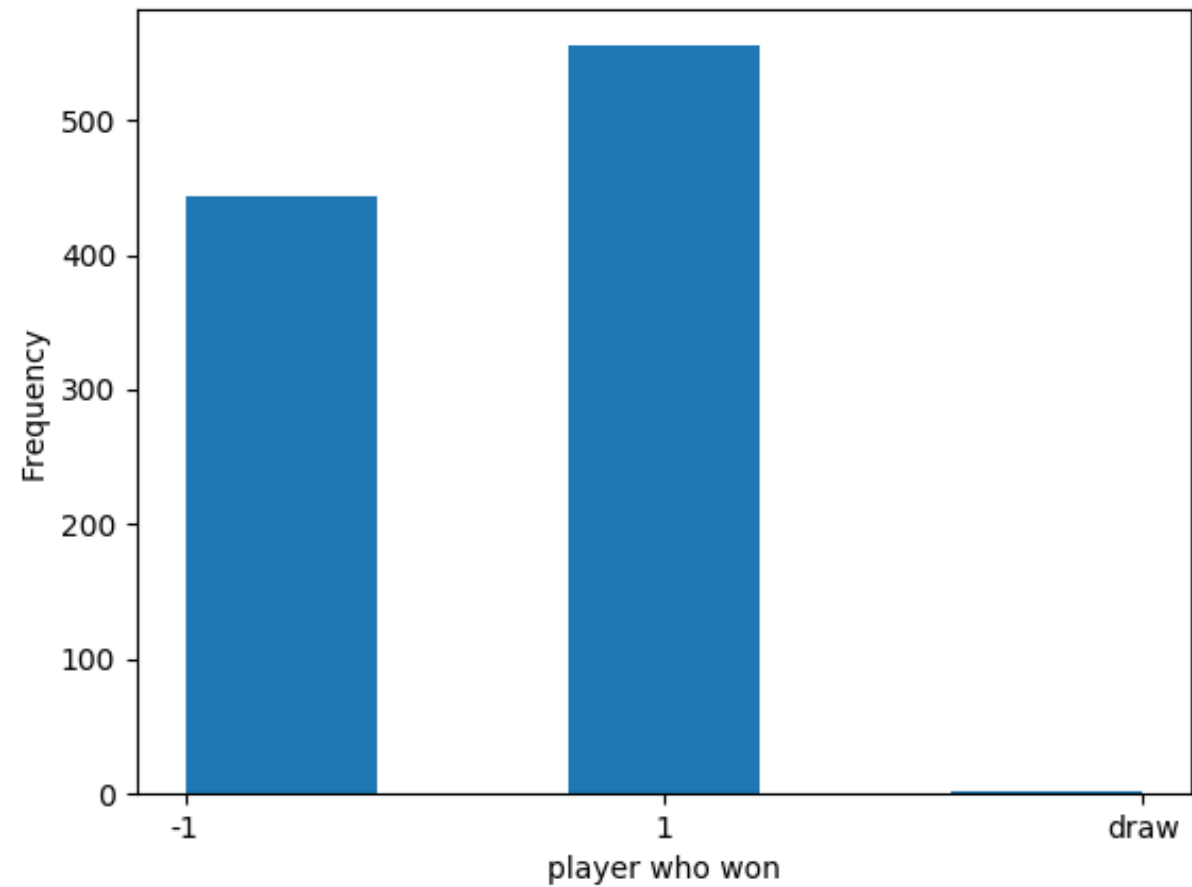
evaluation function
from lecture slides
(number of winning lines)



CONNECT FOUR

Player 1 starts

results of 1000 games of connect four with players playing randomly



CONNECT FOUR

- Probability matrix of player1 's token-positions (using games where player1 won)

```
[[ 0.006  0.005  0.005  0.006  0.006  0.006  0.005]
 [ 0.01   0.01   0.009  0.009  0.01   0.011  0.01  ]
 [ 0.02   0.016  0.02   0.017  0.02   0.022  0.019]
 [ 0.024  0.025  0.029  0.028  0.029  0.025  0.024]
 [ 0.033  0.033  0.035  0.039  0.039  0.035  0.033]
 [ 0.042  0.047  0.048  0.056  0.05   0.045  0.041]]
```

PROBABILITY MATRIX DRAWBACKS

- horizontal layers higher probability
 - get filled more likely (game rules)
- Not a good indicator for diagonal strategy
 - Horizontal layers would have to be filled to reach diagonal win

CONNECT FOUR

GUI realised
Using pygame

