NOUGHTS AND CROSSES

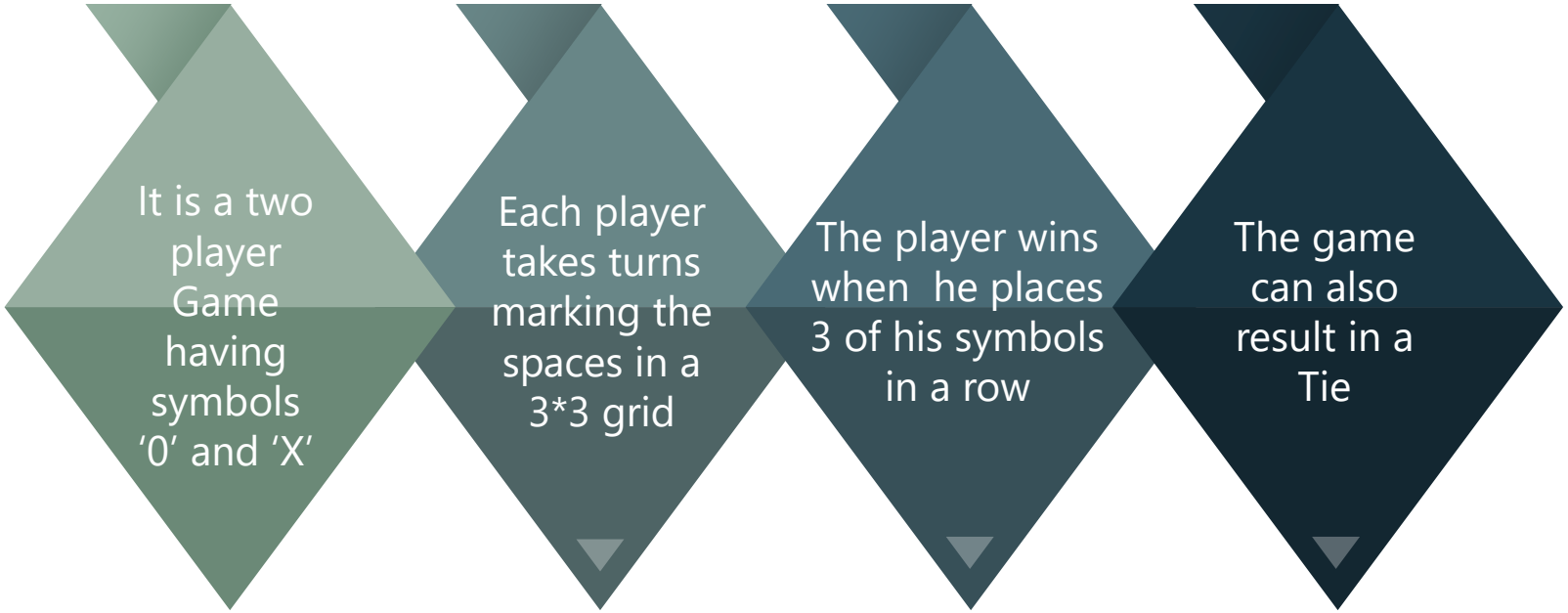
AN APPLICATION OF MONTE CARLO SIMULATION

- Aayushi Vora
- Saloni Agrawal

Agenda

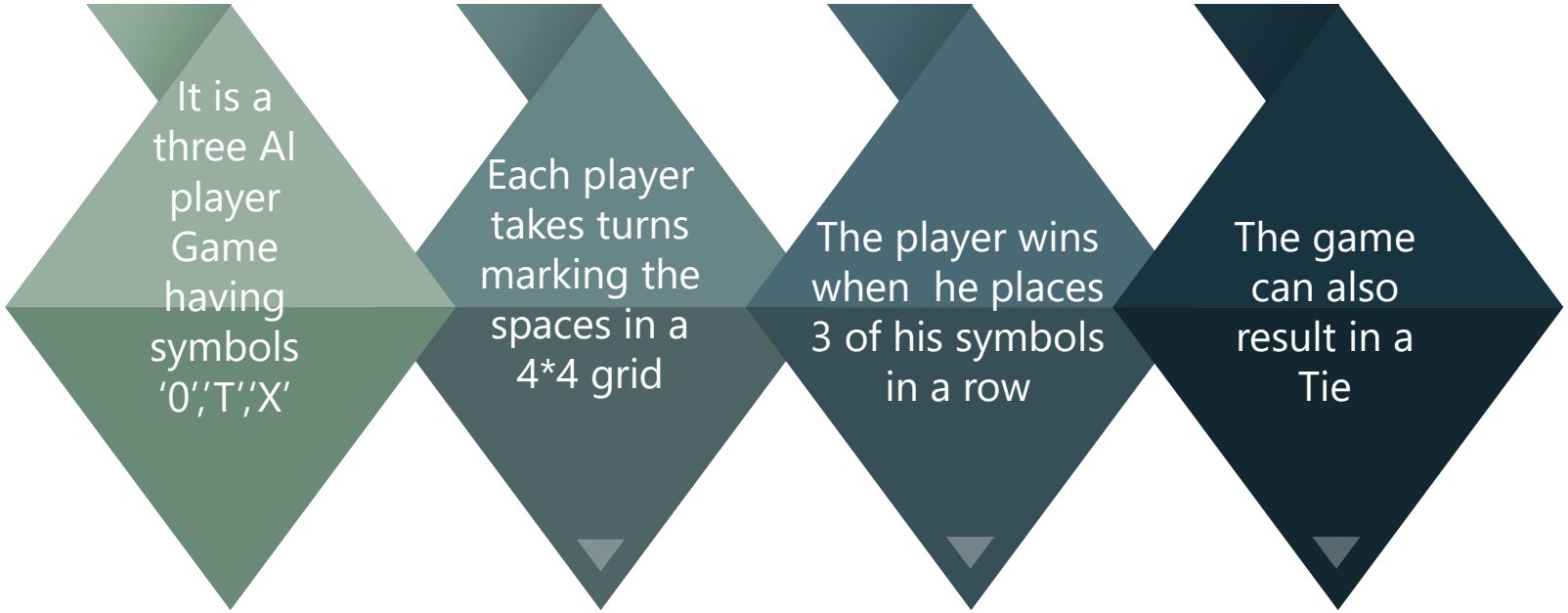

About the Game
Variations in our game
Applying Monte Carlo Simulation
Results
01
02
03
04

About The Game



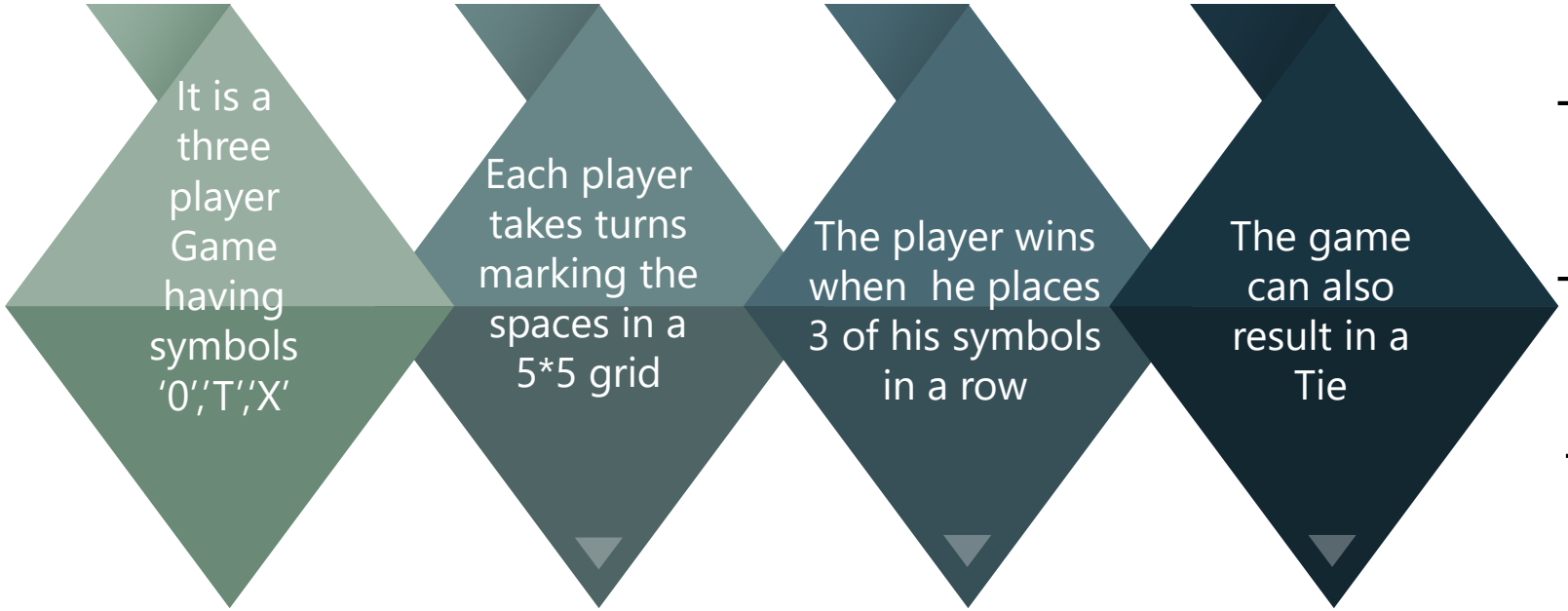
7	8	9
4	5	6
1	2	3

Variations In Our Game (4*4)



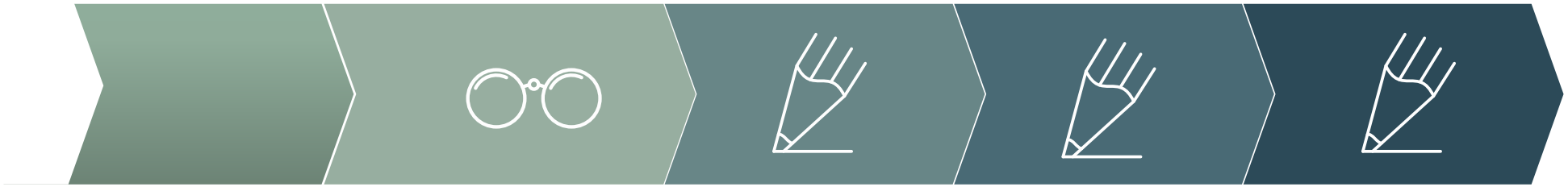
13	14	15	16
9	10	11	12
5	6	7	8
1	2	3	4

Variations In Our Game (5*5)



21	22	23	24	25
16	17	18	19	20
11	12	13	14	15
6	7	8	9	10
1	2	3	4	5

AI Algorithm In Our Game



2 AI will smartly play and the 3rd one will be a dumb one.

Smart AI's will look for the available positions.

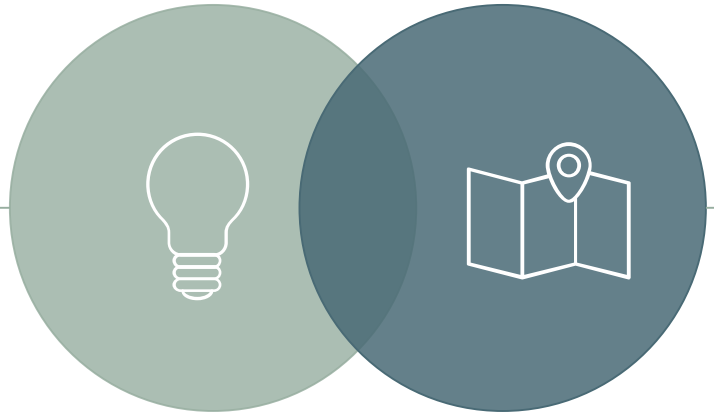
Smart AI's will either look for their own winning positions first.

Or they will look for the competitors winning positions and block them.

Else AI will place its symbol in the remaining other places, whereas the dumb one will place its symbol anywhere in the grid.

About Monte Carlo

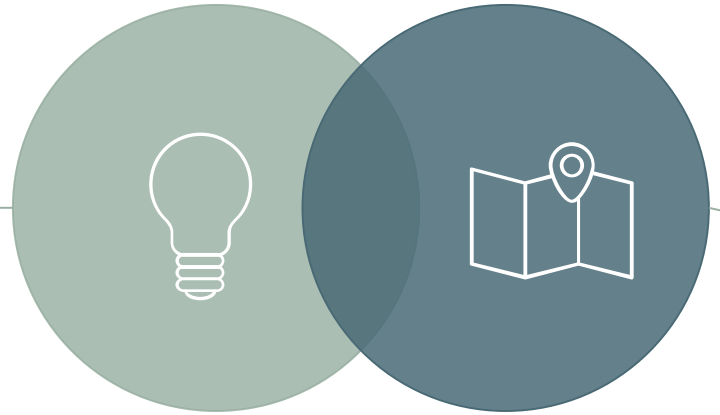
A class of algorithms that rely on repeated random sampling to compute their results.



We have done simulations because from a single game it becomes difficult for determining the exact results. We used Monte Carlo Algorithm in our project to determine the winning probabilities of each AI

Random variables

Sequence_of_players() – This variable randomly selects the sequence/order in which AI's play their turn.



Select_symbol_sequence() –This variable randomly assign a symbol to each AI player.

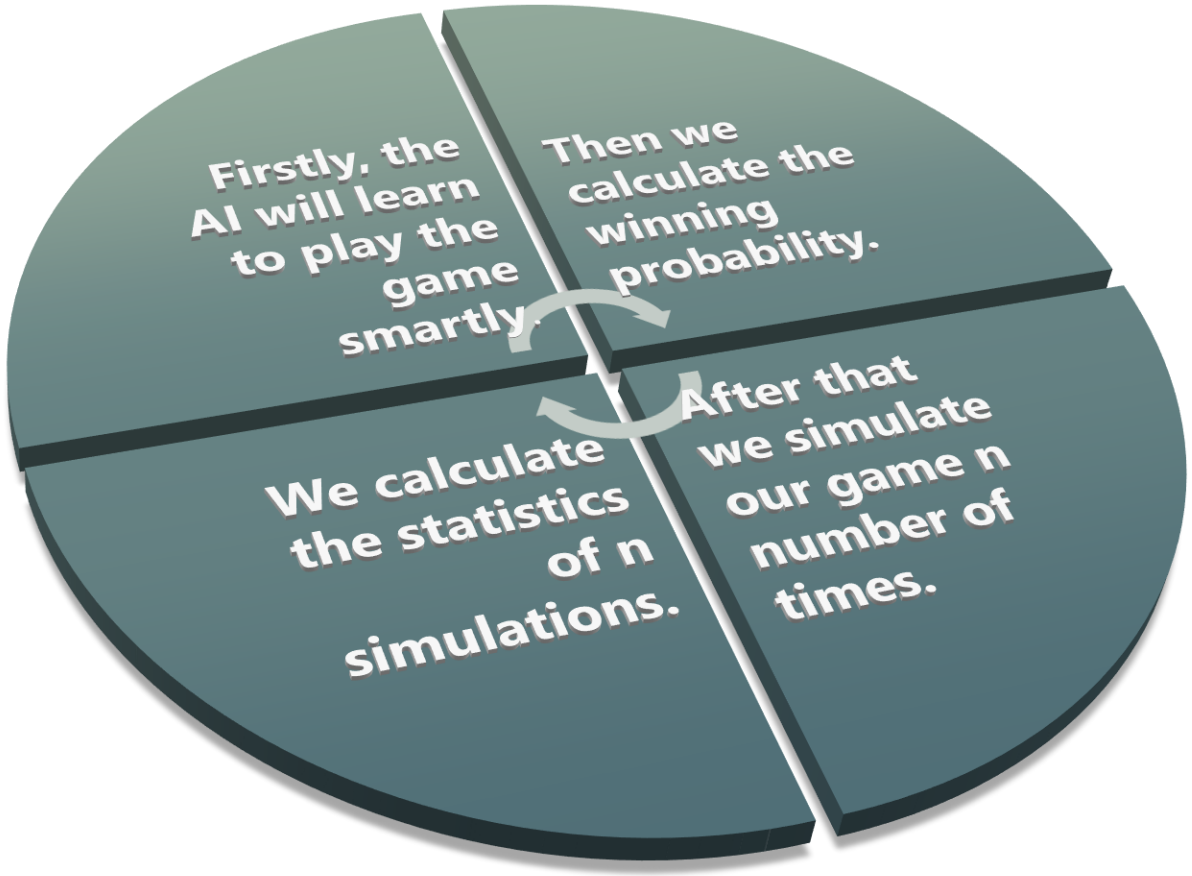
Assumptions and Game rules

- Each player and AI are aware of the game rules.
- A player can use the same strategy as the AI algorithm.
- There can be only one winner(if any) at the end of the game.
- There will be no simultaneous moves.

Hypothesis

- **The winning probability is independent of the order in which the players go.**

Code Execution



THANK YOU!

QUESTIONS/SUGGESTIONS?