

Agenda :-

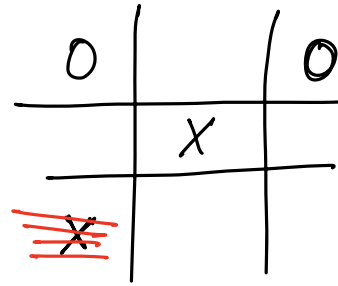
✓ ① undo

② class diagram

③ check winner

$$O(n^3) \rightarrow O(1)$$

Undo : undo the last move,
take your game
one step back

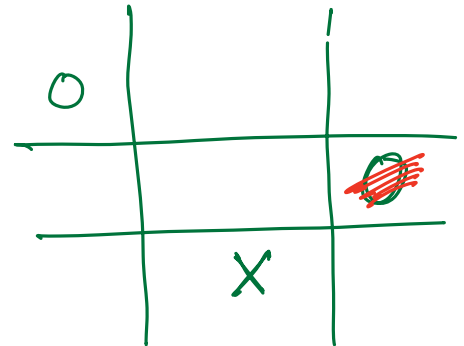


① List < Moves >

↓
r, c, symbol

r	0	2	1
c	0	1	2
sym	"O"	"X"	"O"

↑ undo
 ↓ remove



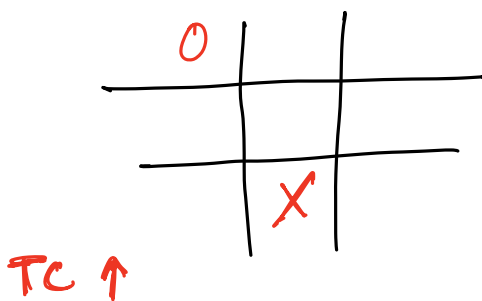
update your turn variable.

② List < Moves > =

0	2	1
0	1	2
"O"	"X"	"O"

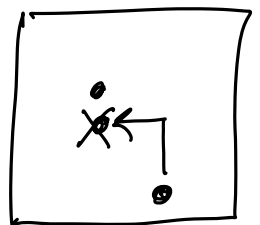
→

recreate the state
by executing all
moves again.



TC ↑

chess : item $(a, b) \rightarrow (c, d)$

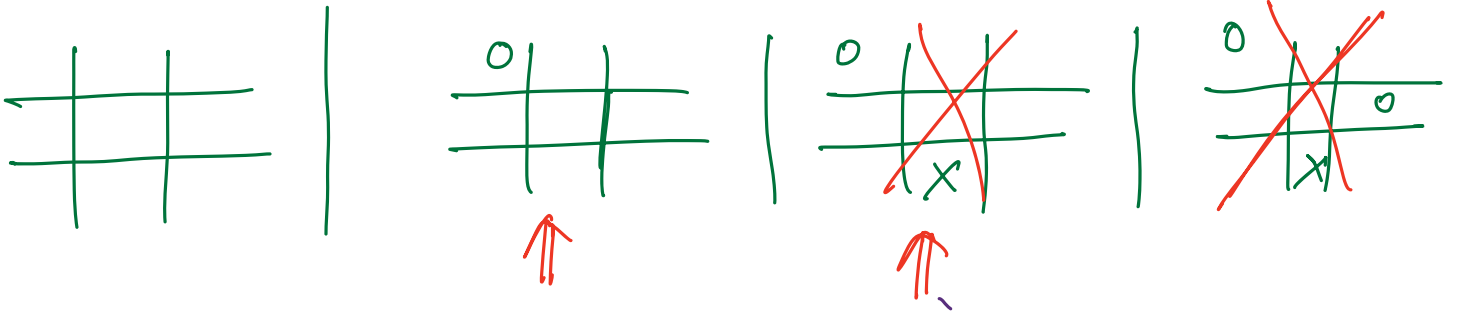
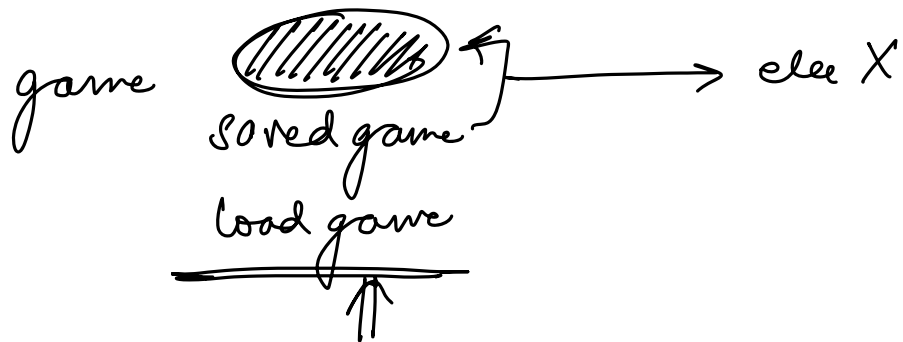


③

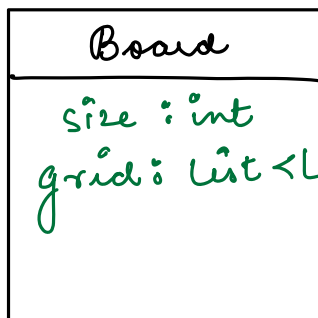
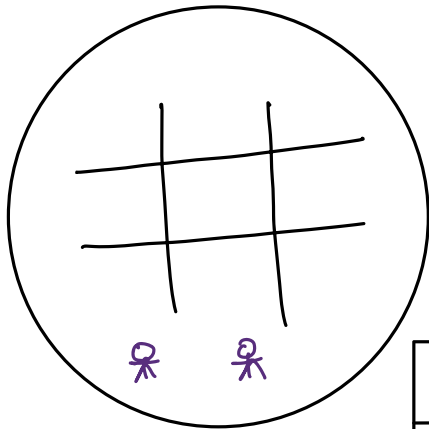
Store the complete detailed state
of each move.



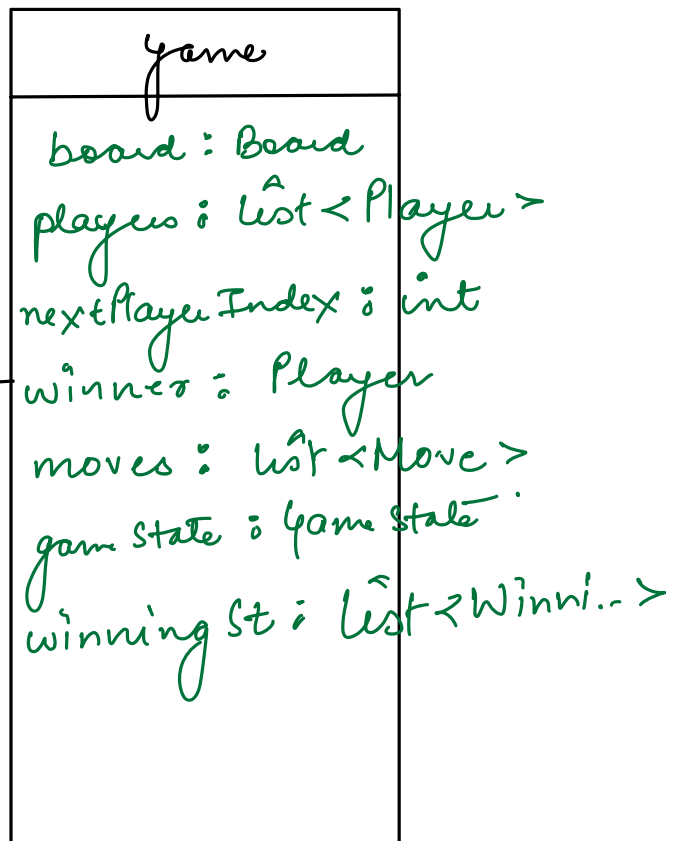
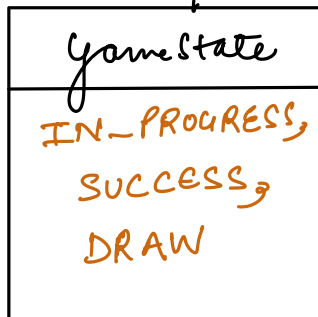
Snapshot



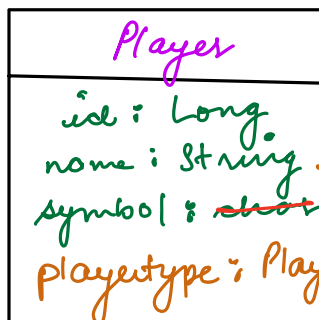
class diagram.



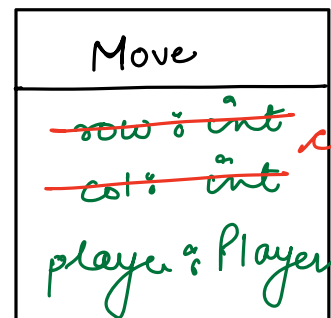
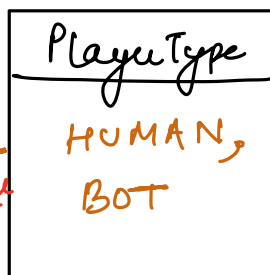
~~char~~
Symbol
cell



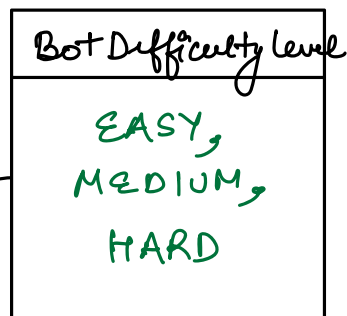
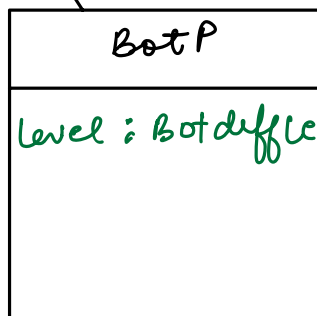
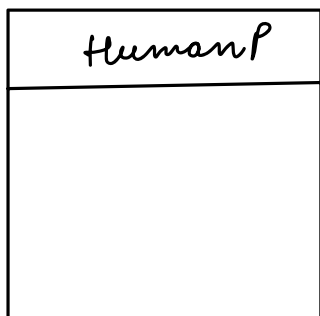
<<abstract>>

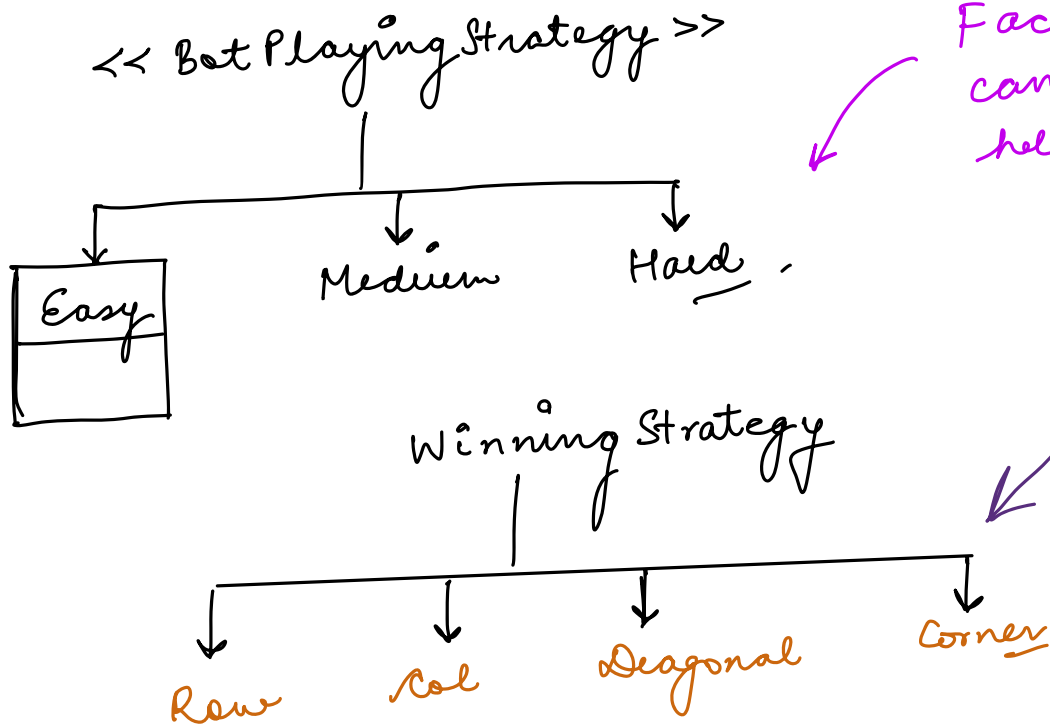
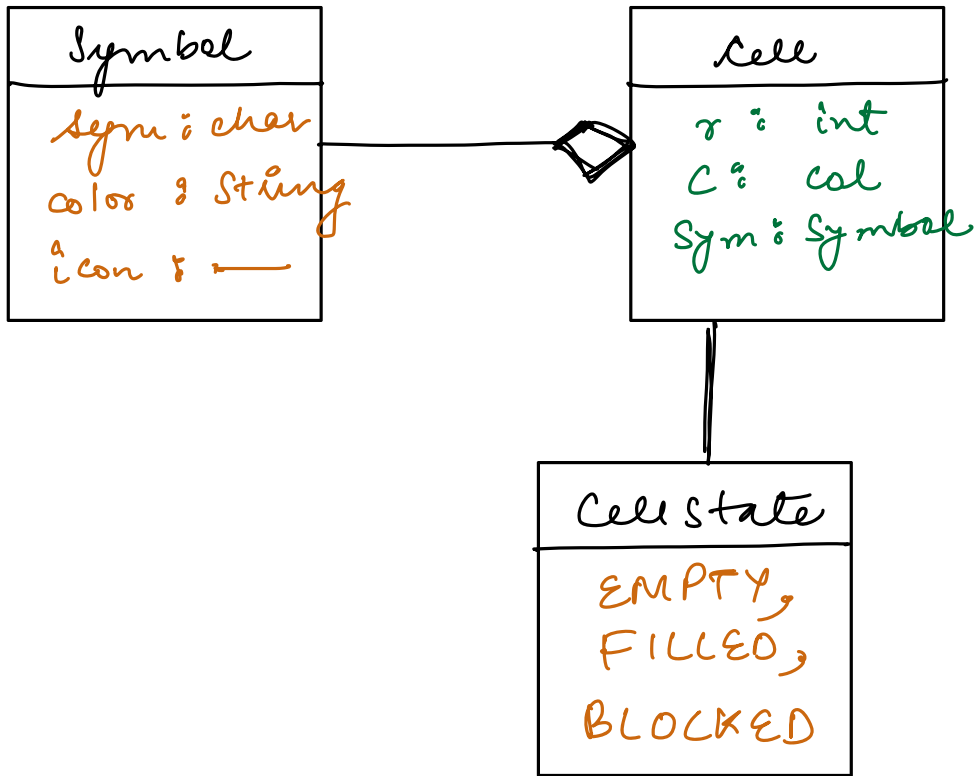


Symbol



cell : Cell





Break: 10:35pm.

Checkwinner

- after every move we will check if there is a winner or not

for all players p :

(x)

bool check = true;

for each row (r) :

check = true;

for each col (c) :

if (board[r][c] != x)

check = false;

break;

if (check)

winner = p;

T.C: $O(n^3)$

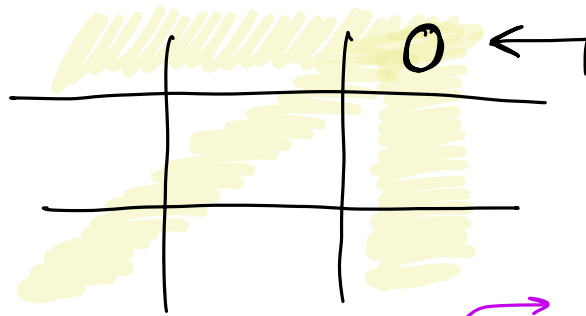
If Mohit has made the last move,
can Rasha win? NO



No need of checking for
each player after every
move.

T.C: $O(n^2)$

III



1 row n
1 col n
1 diagonal n

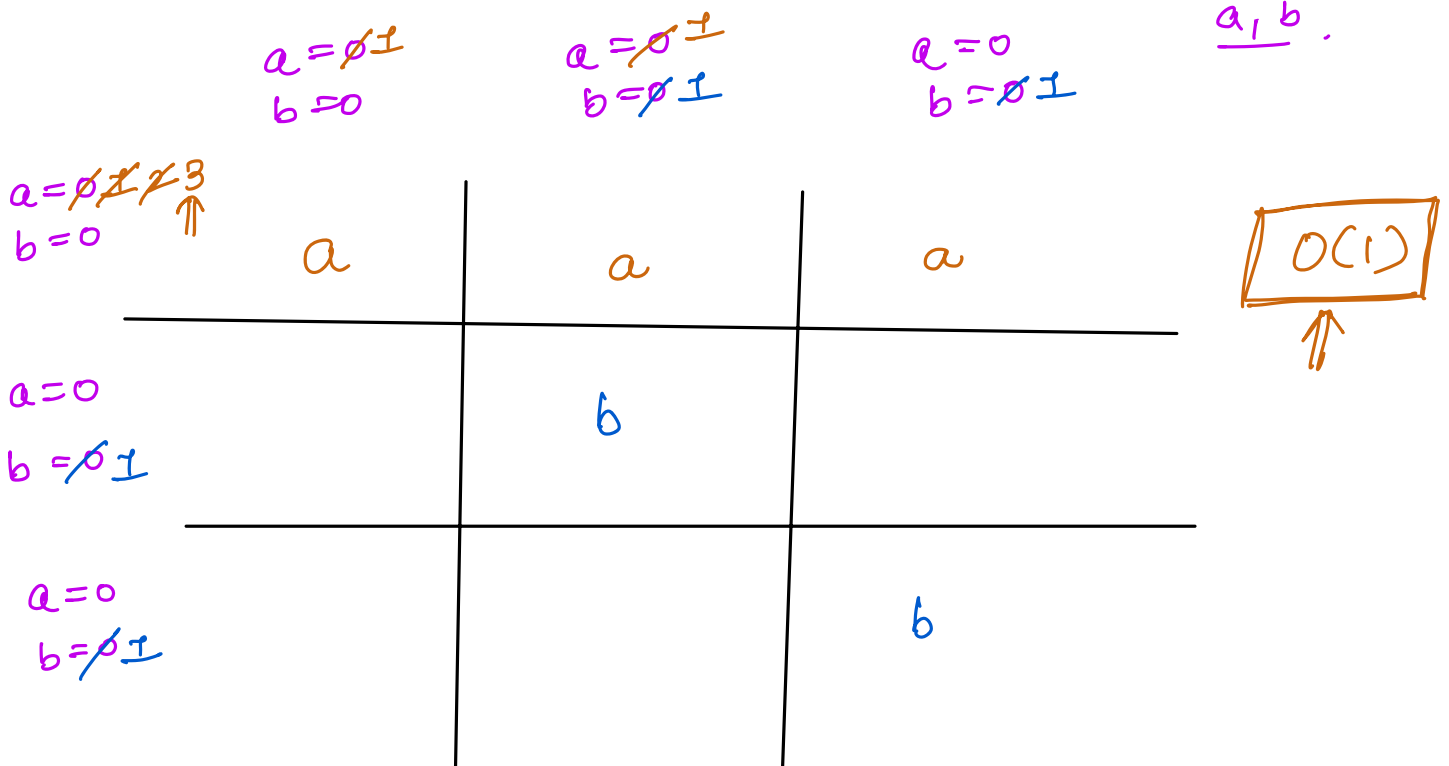
$\underline{3n} \Rightarrow O(n)$ $\left\{ \begin{array}{l} \text{count('x', row)} == \\ \text{no of } \underline{\text{col}} \end{array} \right.$

I am running this loop to check same symbol in the row.

IV

maintain a DS

$\text{count}(\text{symbol}, \text{row}) == \text{size} \Rightarrow \text{winner}$
 $\text{count}(\text{symbol}, \text{col}) == \text{size} \Rightarrow \text{won in the col}$



$$n^3 \rightarrow n^2 \rightarrow n \rightarrow O(1)$$

```
int rowcount[row][symbol]
```

Hashmap -

↓
player_id

Map < pair < row, symbol >, int > m;

Implementation - 2 classes -

31st July - wed
2nd Aug - Friday

Inspector
90%