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In this homework, our aim was to create Tic Tac Toe game which includes two player, one of them is X, another one is O.

Firstly, I create two thread for each player as playerX and playerO and there was also parent thread which is the main part. I send playerX to the thread function which is called as TicTacToe and I also did the same thing for the playerO.

In that function, I used only one mutex to protect table which is my critical session.

Thread Function(player) which is called in my function as TicTacToe

while (game does not finish)

lock the mutex

If table is not full AND winner is not either X or O

if player X's turn OR player O's turn

find random row and column value for matrix
while (that cell in the matrix is not empty)
find random row and column value for matrix
when cell is empty for random row and column values put them to matrix
if player wins the game
finish the game

else
give turn to other player

If table is full AND (winner is not X OR Y)
finish game as tie

unlock the mutex

I used the coarse grained mechanism because the critical session for my game was the table.
I prevented the the race condition as using the condition that the only one player can access to the table and global variables so they can not access a table at the same time. I mean that while game continues, only one player access the table in my code. Also, with the same idea I prevent the deadlocks because each player when their turn comes, they access the table and table then they unlock the mutex. Therefore, other player/thread cannot starve.