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Practical 1 - Artificial Intelligence Lab

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AIM:

Write a program to solve Tic-Tac-Toe without implementation of any specific AI algorithm.

Code:

```python
import math

def printGrid(grid, rows, cols):
    print("Current Game\n\n")
    for i in range(rows):
        print(grid[i])

def checkWinner(grid,rows,cols,x):


    if(grid[0][0]==x and grid[0][1]==x and grid[0][2]==x):
        return True

    if(grid[1][0]==x and grid[1][1]==x and grid[1][2]==x):
        return True

    if(grid[2][0]==x and grid[2][1]==x and grid[2][2]==x):
        return True




    if(grid[0][0]==x and grid[1][0]==x and grid[2][0]==x):
        return True
```

```python
        if(grid[0][1]==x and grid[1][1]==x and grid[2][1]==x):
            return True

        if(grid[0][2]==x and grid[1][2]==x and grid[2][2]==x):
            return True



        if(grid[0][0]==x and grid[1][1]==x and grid[2][2]==x):
            return True

        if(grid[0][2]==x and grid[1][1]==x and grid[2][0]==x):
            return True

        return False

def printChoices(grid, rows, cols):

    lst = []

    for i in range(rows):
        for j in range(cols):
            if(grid[i][j]==0):
                pair = (i+1,j+1)
                lst.append(pair)

    if(len(lst)==0):
        print("No Choices Available")
    else:
        print("Choices Available : ")
        print(*sorted(lst))

def checkValidity(x,y,rows,cols):
    if(x>=0 and x<rows and y>=0 and y<cols):
        return True;
    else:
        return False;

# Starting main code

if __name__ == "__main__":
```

```python
print("Welcome to Tic Tac Toe")

rows = 3
cols = 3

grid = [[0,0,0],[0,0,0],[0,0,0]]


loop = 9
currPlayer = 1

for chance in range(loop):

    print("\n\n")
    printGrid(grid, rows, cols)
    print("\n\n")


    print("Player ", currPlayer, " chance \n\n")

    printChoices(grid, rows, cols)
    x,y = input("Enter where you want to play : ").split()

    x = int(x)
    y = int(y)

    # print(x,y)

    x=x-1
    y=y-1


    if(checkValidity(x,y,rows,cols)==False):
        print("Invalid input")
        continue

    if(grid[x][y]==0):
        grid[x][y] = currPlayer


        if(checkWinner(grid, rows, cols,currPlayer)==True):
            print("Player ", currPlayer, " Won")
```

```
                break

        currPlayer = currPlayer % 2
        currPlayer = currPlayer+1
    else:
        print("Invalid input")

    if(chance==loop-1):
        print("tieeee")
```

Output:

Welcome to Tic Tac Toe

Current Game

[0, 0, 0]
[0, 0, 0]
[0, 0, 0]

Player 1 chance

Choices Available :
(1, 1) (1, 2) (1, 3) (2, 1) (2, 2) (2, 3) (3, 1) (3, 2) (3, 3)
Enter where you want to play : 2 2

Current Game

[0, 0, 0]
[0, 1, 0]
[0, 0, 0]

Player 2 chance

Choices Available :

(1, 1) (1, 2) (1, 3) (2, 1) (2, 3) (3, 1) (3, 2) (3, 3)
Enter where you want to play : 2 1

Current Game

[0, 0, 0]
[2, 1, 0]
[0, 0, 0]

Player 1 chance

Choices Available :
(1, 1) (1, 2) (1, 3) (2, 3) (3, 1) (3, 2) (3, 3)
Enter where you want to play : 1 1

Current Game

[1, 0, 0]
[2, 1, 0]
[0, 0, 0]

Player 2 chance

Choices Available :
(1, 2) (1, 3) (2, 3) (3, 1) (3, 2) (3, 3)
Enter where you want to play : 2 3

Current Game

[1, 0, 0]
[2, 1, 2]
[0, 0, 0]

Player 1 chance

Choices Available :
(1, 2) (1, 3) (3, 1) (3, 2) (3, 3)
Enter where you want to play : 3 3
Player 1 Won