



**INFORMATICS
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Question

Problem:

Create Python program to run a game is also known as “tic-tac-toe”.

Problem Understanding:

This is a simple board game played by 2 human players. Two players are supposed to draw noughts and crosses taking turns on a board. Player 1 may draw noughts while player 2 may draw crosses. The player who can place their symbol diagonally, horizontally, or vertically in a row is the winner of the game. If both players failed to draw 3 of his/her symbols in a row (diagonally, horizontally, or vertically) the game is a draw. A player who can place 3 of his/her symbols diagonally, horizontally, or vertically in a row; before the other player is the winner of the game.

Programming Running

Go to Mainmenu and ask for the option and from the option it can run as enter the game and then enter name at end user won the game or can view the history from database or exit the game from main menu.

Python Code : For Functions

```
# Import Functions
```

```
import os
```

```
#Create Board and User Variables
```

```
board = [' ',' ',' ',' ',' ',' ',' ',' ',' ']
```

```
Winner = 1
```

```
Running = 0
```

```
Draw = -1
```

```
view = 0
```

```
Stop = 1
```

```
Game = Running
```

```
Mark = 'X'
```

```
# Function for Show Game Board
```

```
def ShowBoard():
```

```
    print(" %c | %c | %c " % (board[1],board[2],board[3]))
```

```
    print("____|____|____")
```

```
    print(" %c | %c | %c " % (board[4],board[5],board[6]))
```

```
    print("____|____|____")
```

```
    print(" %c | %c | %c " % (board[7],board[8],board[9]))
```

```
    print("  |  |  ")
```

```
# Function for Checks position is null or not
```

```
def Position(x):
```

```
    if(board[x] == ' '):
```

```
        print("Entered your position ")
```

```
        return True
```

```
    else:
```

```
        print("Entered your position ")
```

```
        return False
```

```
# Function for winning or draw of game
```

```
def Probability():
```

```
    global Game
```

```
    #Horizontal winning condition
```

```
    if(board[1] == board[2] == board[3] != ' '):
```

```
        Game = Winner
```

```
    elif(board[4] == board[5] == board[6] != ' '):
```

```
        Game = Win
```

```
    elif(board[7] == board[8] == board[9] != ' '):
```

```
        Game = Winner
```

```
    #Vertical Winning Condition
```

```
    elif(board[1] == board[4] == board[7] != ' '):
```

```
        Game = Winner
```

```
    elif(board[2] == board[5] == board[8] != ' '):
```

```

        Game = Winner

elif(board[3] == board[6] == board[9] != ' '):

    Game = Winner

#Diagonal Winning Condition

elif(board[1] == board[5] == board[9] != ' '):

    Game = Winner

elif(board[3] == board[5] == board[7] != ' '):

    Game= Winner

#Game Draw Condition

elif(board[1]!=' ' and board[2]!=' ' and board[3]!=' ' and board[4]!=' ' and board[5]!=' ' and
board[6]!=' ' and board[7]!=' ' and board[8]!=' ' and board[9]!=' '):

    Game=Draw

else:

    Game=Running

def StartGame():

    user=1

    usea = "

    userb = "

    count = 1

    print("Tic-Tac-Toe Game")

    print("Player 1 [X], Player 2 [O]")

    # Get user input for their names

```

```

usera = input("Enter your User A name :")

userb = input("Enter your User B name :")

# Start game

while(Game == Running):

    os.system('cls')

    # Display Board

    ShowBoard()

    # Mark the position inputs

    if(user % 2 != 0):

        print("User A")

        Mark = 'X'

    else:

        print("User B")

        Mark = 'O'

    # Get user numbers for position inputs

    option = int(input("Enter the number [1-9] for your position : "))

    if (0<option<10):

        if(Position(option)):

            board[option] = Mark

            user+=1

            Probability()

        else :

            print("Invalid Option")

```



```

        print("Input Number (1-9)")

os.system('cls')

# Show the game board

ShowBoard()

# Draw of game and update to user history into database

if(Game==Draw):

    print("Game Draw")

    # Import Function to connect with Database

    import mysql.connector

    conDict = {'host':'localhost',

                'database':'programming',

                'user':'root',

                'password':''}

    db = mysql.connector.connect(**conDict)

    cursor = db.cursor()

    # Insert data

    myInsertText = "INSERT INTO game_history VALUES(%s,%s,'Draw',%s)"

    myValues = (usera,userb,count)

    cursor.execute(myInsertText,myValues)

    db.commit()

    db.close

    count += 1

```

```

# Winner of game and update to user history into database

elif(Game==Winner):

    user-=1

    if(user%2!=0):

        print("User A Won the Game")

        # Import Function to connect with Database

        import mysql.connector

        conDict = {'host':'localhost',

                    'database':'programming',

                    'user':'root',

                    'password':''}

        db = mysql.connector.connect(**conDict)

        cursor = db.cursor()

        # Insert data

        myInsertText = "INSERT INTO game_history VALUES(%s,%s,'A',%s)"

        myValues = (usera,userb,count)

        cursor.execute(myInsertText,myValues)

        db.commit()

        db.close

        count += 1

    else:

        print("User B Won the Game")

        # Import Function to connect with Database

```

```

import mysql.connector

conDict = {'host':'localhost',

           'database':'programming',

           'user':'root',

           'password':''}

db = mysql.connector.connect(**conDict)

cursor = db.cursor()

# Insert data

myInsertText = "INSERT INTO game_history VALUES(%s,%s,'B',%s)"

myValues = (usera,userb,count)

cursor.execute(myInsertText,myValues)

db.commit()

db.close

count += 1


# Define function for Mainmenu of program

def Mainmenu():

    view = 0

    # Display Menu

    print("----- Mainmenu -----")

    print("1) New Game ")

    print("2) Game History ")

    print("0) Exit Game ")

```

```

view = int(input("Enter the Option : "))

if (view == 1):

    # Recall define part

    StartGame()

    Mainmenu()

elif(view == 2):

    print("View of Game Played")

    # Import database connection and Display the History

    import mysql.connector

    conDict = {'host':'localhost',

               'database':'programming',

               'user':'root',

               'password':''}

    db = mysql.connector.connect(**conDict)

    cursor = db.cursor()

    cursor.execute("SELECT * FROM game_history")

    data = cursor.fetchall()

    for item in data:

        print(item)

    db.close

```

```

        # Go to again main menu

    Mainmenu()

elif(view == 0):

    # Exit the program

    print("Exit the Game")

    exit

else:

    print("Invalid Option")

    Mainmenu()


#----- End of a programme -----

# -----Start -----

For Game


# Import the define functions
from Second import Function


# Recall to Run the Game
Function.Mainmenu()

# -----End of Program -----

```

Table 1: Question

Test Case	Options	Expected Output	Actual Output	Remarks
1	1	Enter the option one to enter the game	Enter the option one to enter the game	Test Case Pass
2	2	Enter the option to view the Game history	Enter the option to view the Game history	Test Case Pass
3	0	Enter the option to exit game	Enter the option to exit game	Test Case Pass
4	1	Play the game and won	Play the game and won	Test Case Pass
5	1	Play the game and Draw	Play the game and Draw	Test Case Pass

```
*IDLE Shell 3.9.6*
File Edit Shell Debug Options Window Help
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Users\ranja\Desktop\20200607\Game.py =====
----- Mainmenu -----
1) New Game
2) Game History
0) Exit Game
Enter the Option : 0
Exit the Game
>>>
===== RESTART: C:\Users\ranja\Desktop\20200607\Game.py =====
----- Mainmenu -----
1) New Game
2) Game History
0) Exit Game
Enter the Option : 1
Tic-Tac-Toe Game
Player 1 [X], Player 2 [O]
Enter your User A name :Mohan
Enter your User B name :Ranjan

| | | |
|_|_|_|
|_|_|_|
|_|_|_|
|_|_|_|

User A
Enter the number [1-9] for your position : 1
Entered your position
X | |
|_|_|_|
|_|_|_|
|_|_|_|
|_|_|_|

User B
Enter the number [1-9] for your position : 2
Entered your position
```

Figure 1: Test 1

```

X | O | 
--|---|
|   |   |
--|---|
|   |   |
|   |   |

User A
Enter the number [1-9] for your position : 3
Entered your position
X | O | X
--|---|
|   |   |
--|---|
|   |   |
|   |   |

User B
Enter the number [1-9] for your position : 4
Entered your position
X | O | X
--|---|
O |   |   |
--|---|
|   |   |
|   |   |

User A
Enter the number [1-9] for your position : 5
Entered your position
X | O | X
--|---|
O | X |   |
--|---|
|   |   |
|   |   |

User B
Enter the number [1-9] for your position : 6
Entered your position
X | O | X
--|---|
O | X | O
--|---|
|   |   |
|   |   |

```

Figure 2: Test 1


```

Entered your position
X | O | X
---|---|---
O |   |   |
---|---|---
|   |   |

User A
Enter the number [1-9] for your position : 5
Entered your position
X | O | X
---|---|---
O | X |   |
---|---|---
|   |   |

User B
Enter the number [1-9] for your position : 6
Entered your position
X | O | X
---|---|---
O | X | O |
---|---|---
|   |   |

User A
Enter the number [1-9] for your position : 7
Entered your position
X | O | X
---|---|---
O | X | O |
---|---|---
X |   |   |

User A Won the Game
----- Mainmenu -----
1) New Game
2) Game History
0) Exit Game
Enter the Option : |

```

Ln: 85 Col: 0

Figure 3 : Test 1 and Won Game

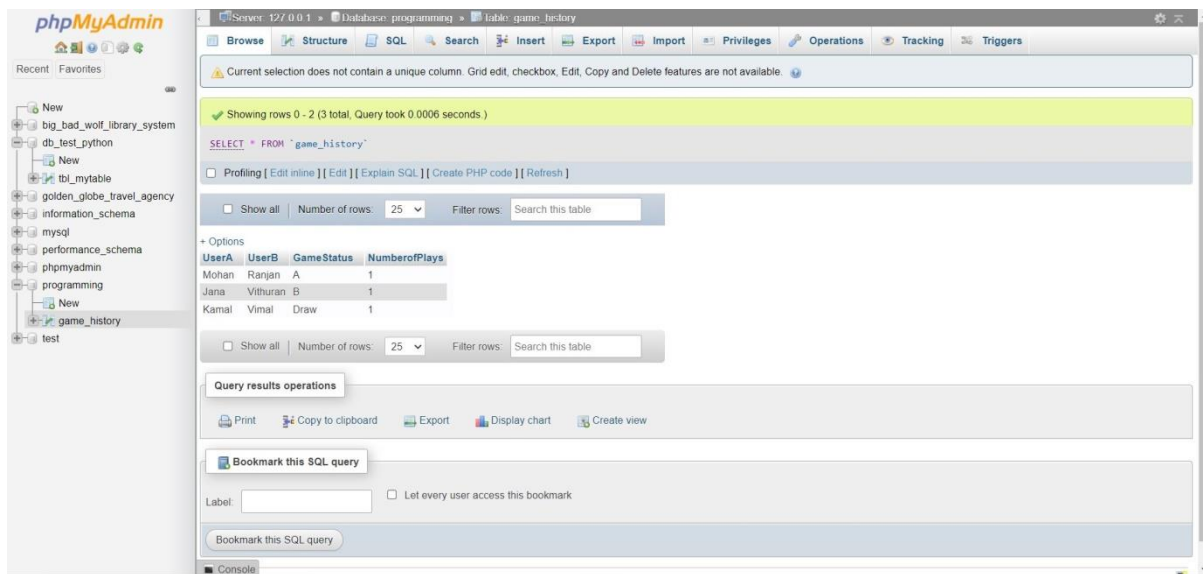


Figure 4 : Test 2

For the use of MySQL commands:

CREATE TABLE game_history(

UserA VARCHAR(15),

UserB VARCHAR(15),

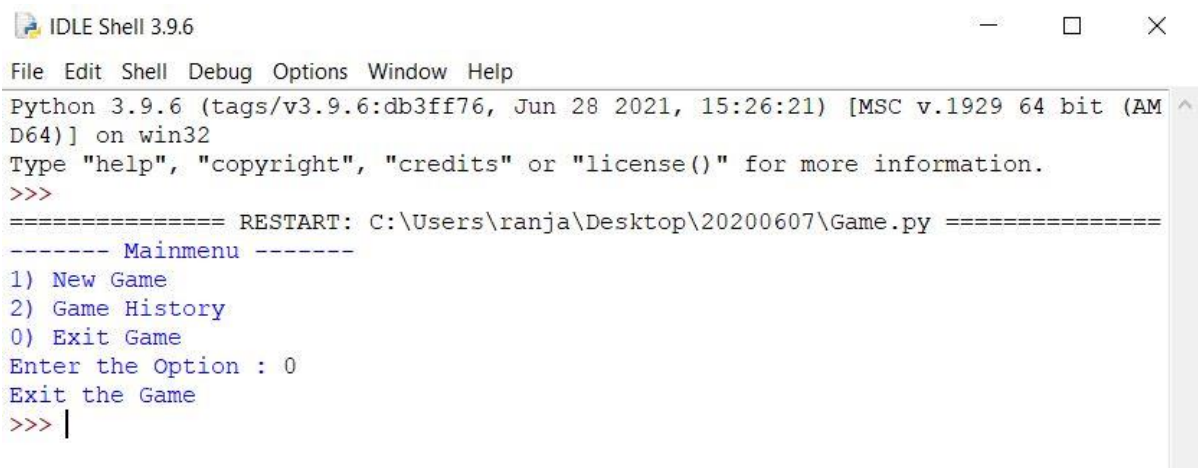
GameStatus VARCHAR(15),

NumberofPlays int(5);

```
*IDLE Shell 3.9.6*
File Edit Shell Debug Options Window Help
Entered your position
X | O | X
| | |
X | O | O
| | |
| X |
| | |
User B
Enter the number [1-9] for your position : 7
Entered your position
X | O | X
| | |
X | O | O
| | |
O | X |
| | |
User A
Enter the number [1-9] for your position : 9
Entered your position
X | O | X
| | |
X | O | O
| | |
O | X | X
| | |
Game Draw
----- Mainmenu -----
1) New Game
2) Game History
0) Exit Game
Enter the Option : 2
View of Game Played
('Mohan', 'Ranjan', 'A', 1)
('Jana', 'Vithuran', 'B', 1)
('Kamal', 'Vimal', 'Draw', 1)
----- Mainmenu -----
1) New Game
2) Game History
0) Exit Game
Enter the Option : |
```

Ln: 108 Col: 0

Figure 5 : Test 2



The screenshot shows a window titled "IDLE Shell 3.9.6" with standard Windows window controls (minimize, maximize, close). The menu bar includes "File", "Edit", "Shell", "Debug", "Options", "Window", and "Help". The shell displays the following text:

```
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Users\ranja\Desktop\20200607\Game.py =====
----- Mainmenu -----
1) New Game
2) Game History
0) Exit Game
Enter the Option : 0
Exit the Game
>>> |
```

Figure 6 : Test 3

```
*IDLE Shell 3.9.6*
File Edit Shell Debug Options Window Help
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Users\ranja\Desktop\20200607\Game.py =====
----- Mainmenu -----
1) New Game
2) Game History
0) Exit Game
Enter the Option : 1
Tic-Tac-Toe Game
Player 1 [X], Player 2 [O]
Enter your User A name :Kamal
Enter your User B name :Vimal

| | | |
|_|_|_|
|_|_|_|
|_|_|_|
|_|_|_|

User A
Enter the number [1-9] for your position : 1
Entered your position
X | |
|_|_|_|
|_|_|_|
|_|_|_|
|_|_|_|

User B
Enter the number [1-9] for your position : 2
Entered your position
X | O |
|_|_|_|
|_|_|_|
|_|_|_|
|_|_|_|

User A
Enter the number [1-9] for your position : 3
```

Figure 7 : Test Draw

```
*IDLE Shell 3.9.6*
File Edit Shell Debug Options Window Help
Enter the number [1-9] for your position : 2
Entered your position
X | O | 
| | 
| | 
| | 
| | 
User A
Enter the number [1-9] for your position : 3
Entered your position
X | O | X
| | 
| | 
| | 
| | 
User B
Enter the number [1-9] for your position : 5
Entered your position
X | O | X
| | 
| O | 
| | 
| | 
User A
Enter the number [1-9] for your position : 4
Entered your position
X | O | X
| | 
X | O | 
| | 
| | 
User B
Enter the number [1-9] for your position : 6
Entered your position
X | O | X
| | 
| | 
| | 
| | 
Ln: 95 Col: 0
```

Figure 8 :Test Draw

```
*IDLE Shell 3.9.6*
File Edit Shell Debug Options Window Help
Entered your position
X | O | X
|_|_|
X | O | O
|_|_|
|_|_|
|_|_|
User A
Enter the number [1-9] for your position : 8
Entered your position
X | O | X
|_|_|
X | O | O
|_|_|
|_|_|
|_|_|
User B
Enter the number [1-9] for your position : 7
Entered your position
X | O | X
|_|_|
X | O | O
|_|_|
O | X | 
|_|_|
User A
Enter the number [1-9] for your position : 9
Entered your position
X | O | X
|_|_|
X | O | O
|_|_|
O | X | X
|_|_|
Game Draw
----- Mainmenu -----
1) New Game
2) Game History
0) Exit Game
Enter the Option : |
```

Ln: 106 Col: 19

Figure 9 Test draw

Conclusion

Many online games are developed in the present world. There is a game name Tic-Tac-Toe is developed through the python and update the game play history into the Database with use of MySQL. This coursework helps to know more about the database software MySQL and python functions. The work done with starting with coding of game Tic-Tac-Toe and update history with use of Database by MySQL.

References

From Assignment Brief

[*https://en.wikipedia.org/wiki/Tic-tac-toe*](https://en.wikipedia.org/wiki/Tic-tac-toe)

[*https://www.youtube.com/watch?v=USEjXNCTvcc*](https://www.youtube.com/watch?v=USEjXNCTvcc)

For Coding

[*https://github.com/Ghalstein/tictactoe/blob/main/tictactoe.py#L1*](https://github.com/Ghalstein/tictactoe/blob/main/tictactoe.py#L1)