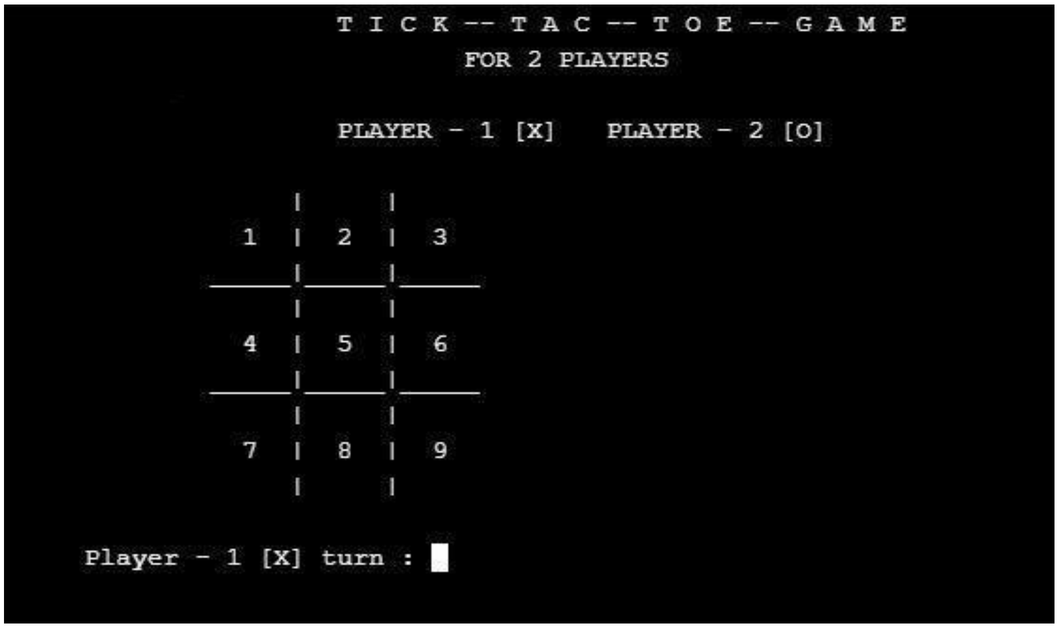
<u>Problem Statement:</u> Write a Program To Implement The Game Tic Tac Toe. Apply The Concept of Polymorphism.

<u>Source Code:</u>

```
//Tic Tac Toe Game in C++
//Importing the inbuild libraries in CPP
#include <iostream> #include <stdlib.h> using namespace std;
//Array for the board char board[3][3] =
{{'1','2','3'},{'4','5','6'},{'7','8','9'}};
//Variable
Declaration int
choice; int
row,column; char turn
= 'X'; bool draw =
false;
//Function to show the current status of the gaming board void
display_board(){  //Rander Game Board LAYOUT  cout<<"PLAYER - 1 [X]t
PLAYER - 2 [O]nn";  cout<<"tt | | n";  cout<<"tt "<<board[0][0]<<" |
"<<board[0][1]<<" | "<<board[0][2]<<" n";
cout<<"tt_____|_____|_____n";  cout<<"tt | | n";
 cout<<"tt "<<board[1][0]<<" | "<<board[1][1]<<" | "<<board[1][2]<<"
n";  cout<<"tt_____|_____|_____n";  cout<<"tt | | n";  cout<<"tt
"<<board[2][0]<<" | "<<board[2][1]<<" | "<<board[2][2]<<" n";
cout<<"tt | | n";
}
//Function to get the player input and update the board
void player_turn(){
 if(turn == 'X'){
cout<<"ntPlayer - 1 [X] turn : ";
 }  else if(turn == 'O'){
cout<<"ntPlayer - 2 [O] turn : ";
 }
 //Taking input from user
 //updating the board according to choice and reassigning the turn Start
cin>> choice;
 //switch case to get which row and column will be
update  switch(choice){  case 1: row=0; column=0; break;
case 2: row=0; column=1; break;  case 3: row=0;
column=2; break;  case 4: row=1; column=0; break;  case
5: row=1; column=1; break;  case 6: row=1; column=2;
break;  case 7: row=2; column=0; break;  case 8: row=2;
column=1; break;  case 9: row=2; column=2; break;
default:
 cout<<"Invalid Move";
 }  if(turn == 'X' && board[row][column] != 'X' && board[row][column] !=
'O'){
 //updating the position for 'X' symbol if
 //it is not already occupied
board[row][column] = 'X';  turn
= 'O';
 }else if(turn == 'O' && board[row][column] != 'X' && board[row][column] != 'O'){
 //updating the position for 'O' symbol if
 //it is not already occupied
board[row][column] = 'O';  turn
= 'X';
 }else {
 //if input position already filled  cout<<"Box already
filled!n Please choose another!!nn";  player_turn();
 }
 /* Ends */
display_board();
}
//Function to get the game status e.g. GAME WON, GAME DRAW GAME IN CONTINUE MODE
 bool
gameover(){
 //checking the win for Simple Rows and Simple Column
 for(int i=0; i<3; i++)  if(board[i][0] == board[i][1] && board[i][0] ==
board[i][2] || board[0][i] == board[1][i]
&& board[0][i] == board[2][i])
return false;
 //checking the win for both diagonal  if(board[0][0] == board[1][1] &&
board[0][0] == board[2][2] || board[0][2] == board[1][1]
&& board[0][2] == board[2][0])
return false;
 //Checking the game is in continue mode or not
for(int i=0; i<3; i++)  for(int j=0; j<3; j++)
if(board[i][j] != 'X' && board[i][j] != 'O')
return true;
 //Checking the if game already draw
draw = true;  return false;
}
//Program Main Method int
main()
{  cout<<"tttT I C K -- T A C -- T O E -- G A M
Ettt";  cout<<"nttttFOR 2 PLAYERSnttt";
while(gameover()){  display_board();  player_turn();
gameover();
 }  if(turn == 'X' && draw == false){
cout<<"nnCongratulations!Player with 'X' has won the game";
 }
 else if(turn == 'O' && draw == false){
 cout<<"nnCongratulations!Player with 'O' has won the game";
 }
else
 cout<<"nnGAME DRAW!!!nn";
}
```

Output:



```
             T I C K -- T A C -- T O E -- G A M E
                         FOR 2 PLAYERS

             PLAYER - 1 [X]   PLAYER - 2 [O]

             |       |
         1   |   2   |   3
      _______|_______|_______
             |       |
         4   |   5   |   6
      _______|_______|_______
             |       |
         7   |   8   |   9
             |       |

   Player - 1 [X] turn :
```