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Class - SE -AI&DS- C1
Roll No - 20

```
//Tic Tac Toe Game
#include <iostream>
#include <vector>
#include <algorithm>
```

```
using namespace std;
```

```
vector<string> board = {"-", "-", "-", "-", "-", "-", "-", "-", "-"};
void printBoard()
{
    cout << board[0] << " | " << board[1] << " | " << board[2] << endl;
    cout << board[3] << " | " << board[4] << " | " << board[5] << endl;
    cout << board[6] << " | " << board[7] << " | " << board[8] << endl;
}
void takeTurn(string player)
{
    cout << player << "'s turn." << endl;
    cout << "Choose a position from 1-9: ";
    int position;
    cin >> position;
    position -= 1;
    while (position < 0 || position > 8 || board[position] != "-")
    {
        cout << "Invalid input or position already taken. Choose a different position: ";
        cin >> position;
        position -= 1;
    }
    board[position] = player;
    printBoard();
}

string checkGameOver()
{
    if ((board[0] == board[1] && board[1] == board[2] && board[0] != "-") ||
        (board[3] == board[4] && board[4] == board[5] && board[3] != "-") ||
        (board[6] == board[7] && board[7] == board[8] && board[6] != "-") ||
        (board[0] == board[3] && board[3] == board[6] && board[0] != "-") ||
        (board[1] == board[4] && board[4] == board[7] && board[1] != "-") ||
        (board[2] == board[5] && board[5] == board[8] && board[2] != "-") ||
```

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        (board[0] == board[4] && board[4] == board[8] && board[0] != "-") ||
        (board[2] == board[4] && board[4] == board[6] && board[2] != "-"))
    {
        return "win";
    }
    else if (count(board.begin(), board.end(), "-") == 0)
    {
        return "tie";
    }

    else
    {
        return "play";
    }
}
int main()
{
    printBoard();
    string currentPlayer = "X";
    bool gameOver = false;
    while (!gameOver)
    {
        takeTurn(currentPlayer);
        string gameResult = checkGameOver();
        if (gameResult == "win")
        {
            cout << currentPlayer << " wins!" << endl;
            gameOver = true;
        }
        else if (gameResult == "tie")
        {
            cout << "It's a tie!" << endl;
            gameOver = true;
        }
        else
        {
            currentPlayer = currentPlayer == "X" ? "O" : "X";
        }
    }
    return 0;
}

```

COMMAND:-

```
ubuntu@ubuntu-OptiPlex-3090:~$ g++ tic.cpp -o tic -lgraph
ubuntu@ubuntu-OptiPlex-3090:~$ ./tic
```

OUTPUT:

X wins

```
ubuntu@ubuntu-OptiPlex-3090:~$ g++ tic.cpp -o tic -lgraph
ubuntu@ubuntu-OptiPlex-3090:~$ ./tic
- | - | -
- | - | -
- | - | -
X's turn.
Choose a position from 1-9: 1
X | - | -
- | - | -
- | - | -
O's turn.
Choose a position from 1-9: 2
X | O | -
- | - | -
- | - | -
X's turn.
Choose a position from 1-9: 5
X | O | -
- | X | -
- | - | -
O's turn.
Choose a position from 1-9: 8
X | O | -
- | X | -
- | O | -
X's turn.
Choose a position from 1-9: 9
X | O | -
- | X | -
- | O | X
X wins!
```

```
ubuntu@ubuntu-OptiPlex-3090:~$ g++ tic.cpp -o tic -lgraph
ubuntu@ubuntu-OptiPlex-3090:~$ ./tic
- | - | -
- | - | -
- | - | -
X's turn.
Choose a position from 1-9: 1
X | - | -
- | - | -
- | - | -
O's turn.
Choose a position from 1-9: 2
X | O | -
- | - | -
- | - | -
X's turn.
Choose a position from 1-9: 3
X | O | X
- | - | -
- | - | -
O's turn.
Choose a position from 1-9: 5
X | O | X
- | O | -
- | - | -
X's turn.
Choose a position from 1-9: 9
X | O | X
- | O | -
- | - | X
O's turn.
Choose a position from 1-9: 8
X | O | X
- | O | -
- | O | X
O wins!
```

```
oem@oem-OptiPlex-3000:~$ ./tic
```

```
- | - | -  
- | - | -  
- | - | -
```

X's turn.

Choose a position from 1-9: 1

```
X | - | -  
- | - | -  
- | - | -
```

O's turn.

Choose a position from 1-9: 9

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

X's turn.

Choose a position from 1-9: 7

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

O's turn.

Choose a position from 1-9: 4

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

X's turn.

Choose a position from 1-9: 3

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

O's turn.

Choose a position from 1-9: 5

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

X's turn.

Choose a position from 1-9: 6

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

O's turn.

Choose a position from 1-9: 2

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

X's turn.

Choose a position from 1-9: 8

```
X | O | X  
O | O | X  
X | X | O
```

It's a tie!