Girls' Programming Network

Tic Tac Toe!

Tutors Only

This project was created by GPN Australia for GPN sites all around Australia!

This workbook and related materials were created by tutors at:

Sydney, Canberra and Perth

Girls' Programming Network

If you see any of the following tutors don't forget to thank them!!

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ATLASSIAN

Part 1: Welcome to Tic Tac Toe!

1.4: Printing the Board

```
# Copy your previous code here...
print("Welcome to Tic-Tac-Toe!")
board = [" ", " ", " ", " ", " ", " ", " ", " ", " "]
print("-------------")
print("|", board[0], "|", board[1], "|", board[2], "|")
print("-------------")
print("|", board[3], "|", board[4], "|", board[5], "|")
print("-------------")
print("|", board[6], "|", board[7], "|", board[8], "|")
print("-------------")
```

Part 2: Enter the First Move

2.3: Check what happened!

```
# Copy your previous code here...
print("Welcome to Tic-Tac-Toe!")
board = [" ", " ", " ", " ", " ", " ", " ", " ", " "]
print("-------------")
print("|", board[0], "|", board[1], "|", board[2], "|")
print("-------------")
print("|", board[3], "|", board[4], "|", board[5], "|")
print("-------------")
print("|", board[6], "|", board[7], "|", board[8], "|")
print("-------------")

symbol = "0"
square = input("Which square do you want your symbol to go in? ")
square _index = int(square)
board[square_index] = symbol
```

Bonus 2.5: Welcome the players

```
# Copy your previous code here...
print("Welcome to Tic-Tac-Toe!")
player_O = input("Who is playing naughts? ")
player_X = input("Who is playing crosses? ")

print("Welcome", player_O, ", your symbol is O!")
print("Welcome", player_X, ", your symbol is X!")
board = [" ", " ", " ", " ", " ", " ", " ", " ", " "]
```

```
print("-------------")
print("|", board[0], "|", board[1], "|", board[2], "|")
print("-------------")
print("|", board[3], "|", board[4], "|", board[5], "|")
print("-------------")
print("|", board[6], "|", board[7], "|", board[8], "|")
print("-------------")

symbol = "0"
square = input("Which square do you want your symbol to go in? ")
square _index = int(square)
board[square_index] = symbol
```

Part 3: Creating a print function

3.4: Let's print the board again

```
# Copy your previous code here...
def print_board(board):
    print("-------------")
    print("|", board[0], "|", board[1], "|", board[2], "|")
    print("-------------")
    print("|", board[3], "|", board[4], "|", board[5], "|")
    print("-------------")
    print("|", board[6], "|", board[7], "|", board[8], "|")
    print("-------------")
print("Welcome to Tic-Tac-Toe!")
player_O = input("Who is playing naughts? ")
player_X = input("Who is playing crosses? ")

print("Welcome", player_O, ", your symbol is O!")
print("Welcome", player_X, ", your symbol is X!")
board = [" ", " ", " ", " ", " ", " ", " ", " ", " "]
print_board(board)

symbol = "0"
square = input("Which square do you want your symbol to go in? ")
square _index = int(square)
board[square_index] = symbol

print_board(board)
```

Part 4 : Taking Turns

4.3 Run your code!

```
# Copy your previous code here...
def print_board(board):
    print("-------------")
    print("|", board[0], "|", board[1], "|", board[2], "|")
    print("-------------")
    print("|", board[3], "|", board[4], "|", board[5], "|")
    print("-------------")
    print("|", board[6], "|", board[7], "|", board[8], "|")
    print("-------------")
print("Welcome to Tic-Tac-Toe!")
player_O = input("Who is playing naughts? ")
player_X = input("Who is playing crosses? ")

print("Welcome", player_O, ", your symbol is O!")
print("Welcome", player_X, ", your symbol is X!")
board = [" ", " ", " ", " ", " ", " ", " ", " ", " "]
print_board(board)

symbol = "0"
print("The current player is", symbol, "!")
square = input("Which square do you want your symbol to go in? ")
square _index = int(square)
board[square_index] = symbol

print_board(board)
if symbol == "0":
    symbol = "X"
else:
    symbol = "0"
```

Part 5 : Wait a while to win?

5.2 Did I win yet?

```
# Copy your previous code here...
def print_board(board):
    print("-------------")
    print("|", board[0], "|", board[1], "|", board[2], "|")
    print("-------------")
    print("|", board[3], "|", board[4], "|", board[5], "|")
    print("-------------")
    print("|", board[6], "|", board[7], "|", board[8], "|")
    print("-------------")
print("Welcome to Tic-Tac-Toe!")
player_O = input("Who is playing naughts? ")
player_X = input("Who is playing crosses? ")

print("Welcome", player_O, ", your symbol is O!")
print("Welcome", player_X, ", your symbol is X!")
board = [" ", " ", " ", " ", " ", " ", " ", " ", " "]
game_over = False
print_board(board)

symbol = "0"
while not game_over:
    print("The current player is", symbol, "!")
    square = input("Which square do you want your symbol to go in? ")
    square _index = int(square)
    board[square_index] = symbol

    print_board(board)
    if symbol == "0":
        symbol = "X"
    else:
        symbol = "0"
```

Part 6 : Winner winner tic tac dinner

6.2 Functions again

```
# Copy your previous code here...
def print_board(board):
    print("-------------")
    print("|", board[0], "|", board[1], "|", board[2], "|")
    print("-------------")
    print("|", board[3], "|", board[4], "|", board[5], "|")
    print("-------------")
    print("|", board[6], "|", board[7], "|", board[8], "|")
    print("-------------")
def check_winner:

print("Welcome to Tic-Tac-Toe!")
player_O = input("Who is playing naughts? ")
player_X = input("Who is playing crosses? ")

print("Welcome", player_O, ", your symbol is O!")
print("Welcome", player_X, ", your symbol is X!")
board = [" ", " ", " ", " ", " ", " ", " ", " ", " "]
game_over = False
print_board(board)

symbol = "0"
while not game_over:
    print("The current player is", symbol, "!")
    square = input("Which square do you want your symbol to go in? ")
    square _index = int(square)
    board[square_index] = symbol

    print_board(board)
    if symbol == "0":
        symbol = "X"
    else:
        symbol = "0"
```

Part 7.1 : Option 1

7.1.4 No winners here!

Option 1: If statements

```
def check winner(board) :
    if board[0] == board[1] == board[2] != " ":
        return True
    elif board[3] == board[4] == board[5] != " ":
        return True
    elif board[6] == board[7] == board[8] != " ":
        return True
    if board[0] == board[3] == board[6] != " ":
        return True
    elif board[1] == board[4] == board[7] != " ":
        return True
    elif board[2] == board[5] == board[8] != " ":
        return True
    if board[0] == board[4] == board[8] != " ":
        return True
    elif board[2] == board[4] == board[6] != " ":
        return True
    else:
        return False
```

Part 7.2 : Option 2

7.1.4 No winners here!

Option 2: For loop and lists

```
def check winner(board) :
    winning combos = [
        # Rows
        (0,1,2),
        (3,4,5),
        (6,7,8),
        # Columns
        (0,3,6),
        (1,4,7),
        (2,5,8),
        # Diagonals
        (0,4,8),
        (2,4,6)
    ]

    for combo in winning_combos:
        combo_part_0 = combo[0]
        combo_part_1 = combo[1]
        combo_part_2 = combo[2]
        symbol_0 = board[combo_part_0]
        symbol_1 = board[combo_part_1]
        symbol_2 = board[combo_part_2]
        if symbol_0 == symbol_1 == symbol_2 == " ":
        return True
    return False
```

Part 8 : Declare the winner

8.2 Declare who won

```
# Copy your previous code here...
def print_board(board):
    print("-------------")
    print("|", board[0], "|", board[1], "|", board[2], "|")
    print("-------------")
    print("|", board[3], "|", board[4], "|", board[5], "|")
    print("-------------")
    print("|", board[6], "|", board[7], "|", board[8], "|")
    print("-------------")
# Be aware that students may have used the Option 2 code here
def check_winner(board) :
    if board[0] == board[1] == board[2] != " ":
        return True
    elif board[3] == board[4] == board[5] != " ":
        return True
    elif board[6] == board[7] == board[8] != " ":
        return True
    if board[0] == board[3] == board[6] != " ":
        return True
    elif board[1] == board[4] == board[7] != " ":
        return True
    elif board[2] == board[5] == board[8] != " ":
        return True
    if board[0] == board[4] == board[8] != " ":
        return True
    elif board[2] == board[4] == board[6] != " ":
        return True
    else:
        return False


print("Welcome to Tic-Tac-Toe!")
player_O = input("Who is playing naughts? ")
player_X = input("Who is playing crosses? ")

print("Welcome", player_O, ", your symbol is O!")
print("Welcome", player_X, ", your symbol is X!")
board = [" ", " ", " ", " ", " ", " ", " ", " ", " "]
game_over = False
print_board(board)

symbol = "0"
while not game_over:
    print("The current player is", symbol, "!")
    square = input("Which square do you want your symbol to go in? ")
```

```
    square_index = int(square)
    board[square_index] = symbol

    print_board(board)
    game_over = check_winner(board)
    if game_over:
        print(symbol, "won! Congratulations!")
    if symbol == "0":
        symbol = "X"
    else:
        symbol = "0"
```

Extensions

All extensions commented with which

```
import random

# Copy your previous code here...
def print_board(board):
    print("-------------")
    print("|", board[0], "|", board[1], "|", board[2], "|")
    print("-------------")
    print("|", board[3], "|", board[4], "|", board[5], "|")
    print("-------------")
    print("|", board[6], "|", board[7], "|", board[8], "|")
    print("-------------")
# Be aware that students may have used the Option 2 code here
def check_winner(board) :
    if board[0] == board[1] == board[2] != " ":
        return True
    elif board[3] == board[4] == board[5] != " ":
        return True
    elif board[6] == board[7] == board[8] != " ":
        return True
    if board[0] == board[3] == board[6] != " ":
        return True
    elif board[1] == board[4] == board[7] != " ":
        return True
    elif board[2] == board[5] == board[8] != " ":
        return True
    if board[0] == board[4] == board[8] != " ":
        return True
    elif board[2] == board[4] == board[6] != " ":
        return True
    else:
        return False


print("Welcome to Tic-Tac-Toe!")
player_O = input("Who is playing naughts? ")
player_X = input("Who is playing crosses? ")

print("Welcome", player_O, ", your symbol is O!")
print("Welcome", player_X, ", your symbol is X!")
board = [" ", " ", " ", " ", " ", " ", " ", " ", " "]
game_over = False
print_board(board)

# Extension 9
symbol = random.choice("X","O")
```

```
# Extension 12
if symbol == "O":
    current_player = player_O
else:
    current_player = player_X
print(symbol,"player will go first!")
free_squares = [0,1,2,3,4,5,6,7,8]
counter = 0
while not game_over:
    print("The current player is", current_player, "Who is playing as", symbol,"!")
#Extension 12

    # Extension 13
    if current_player == "computer":
        square = random.choice(free_squares)
    else:
        square = input("Which square do you want your symbol to go in? ")
    square_index = int(square)

    #  Extension 9
    if square_index not in free_squares:
        print("That wasn't a valid move!")
        continue
    board[square_index] = symbol
    counter+=1

    print_board(board)
    free_squares.remove(square_index)
    game_over = check_winner(board)
    if game_over:
        print(current_player, "won! Congratulations!")
    elif counter == 9: # Extension 10
        print("It's a tie!")
        break


    if symbol == "0":
        current_player = player_X
        symbol = "X"
    else:
        current_player = player_O
        symbol = "0"
```