**Exploring Recursion and Tic-Tac-Toe**

Before we continue with our Tic-Tac-Toe program, let’s continue exploring recursion! Follow the steps below to consider the connections between our Tic-Tac-Toe program and recursion.

1. **Step 1:** Map out all of the potential outcomes of the board below.
2. **Step 2:** On your diagram, label the different where you see the parts of our Tic Tac Toe program:

* take\_turn
* check\_win
* check\_tie

1. **Step 3:** Reflect on how this diagram and the repetition of commands connects to recursion. It’s ok if you’re not quite sure yet, but just start thinking about it! What might we consider the base case? What might we consider the recursive case?

It’s player X’s turn!

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

Where does X go? What is the outcome?

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

Player O’s Turn! Where does O go? What is the outcome?

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

Player X’s turn! Where does X go? What is the outcome?

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