IS4151 Individual Assignment 1

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**Tic Tac Toe Micro:bit Game System**

Diagram of system

A picture containing text

Description automatically generated

List of Assumptions

1. gameDisplayProgram.py assumes Controller is communicating with a Windows USB port (COM7) and is automatically paired with the Controller upon reset/power on
2. User waits for each line to be communicated completely via serial before issuing the next command (such as pressing a button)
   1. Rationale: When ignoring the pause period and going faster than the serial output on the terminal, some radio data does not get sent out and the game device needs to be reset
3. The game score for any player will reset to 0 upon reaching 100 for either side.
   1. Rationale: The scoreboard cannot display > 99 for either side of the player
4. Player One is always on the LEFT side and Player Two is always on the RIGHT side
   1. Rationale: The scoreboard will display score considering Player One as the leftmost 2 digits, and Player Two as the rightmost 2 digits
5. Game board starts from size 3 and ends at size 10. For coordinates of cells, they thus start from (0,0) and end at (n-1, n-1). For a game board of size 10, the top-leftmost cell is (0,0) and bottom-rightmost cell is (9,9). This affects the cell selection window in the Game Device, digits 0 to 9 are used to show the x and y coordinates.

Explanation of states

|  |  |  |
| --- | --- | --- |
| Device Name | State No. | State Description |
| Game Controller | 0 | Waiting to pair |
| 1 | Paired with Terminal  Waiting to pair with Player One |
| 2 | Paired with Player One  Waiting to pair with Player Two |
| 3 | Paired with Player Two  Waiting for A+B (Start new series) |
| 4 | New series started  Waiting for A (New game) |
| 5 | New game started  Waiting for board size input |
| 6 | Board size confirmed  Started new game  Waiting for Move 1/2 |
| 7 | Received Move 1/2  Waiting for Move 2/2 |
| Game Device | 0 | Not paired with Game Controller |
| 1 | Received pairing response from Game Controller  Waiting for Game Request as Player One |
| 2 | Received pairing response from Game Controller  Waiting for Game Request as Player Two |
| 3 | Game Request received  Board Size received  Waiting for notification of Move order (either 1/2 or 2/2) |
| 4 | Playing as Move 1/2  Waiting for Move 1/2 ACK from Game Controller |
| 5 | Playing as Move 2/2  Waiting for Move 2/2 ACK from Game Controller |
| 6 | Received Move 1/2 or Move 2/2 ACK  Turn off display  Waiting for instructions of Move order (either 1/2 or 2/2) |