**Zumo Demonstration Video README:**

This will be a small bullet point list for each button press on the GUI from the video.

**Notes:**

* I only did one video of task 7, instead of a video for each task as I believe this video covers all the tasks.
* The board game boxes are not intended to be obstacles they are just there to keep the mat flat, the only obstacle is the mug in the first room.
* The small grid made of tape is from my groups task 2 assignment and not a part of this demonstration.

**Button Press List:**

* “GO!” button pressed at start of maze to begin Zumo auto navigation.
* GUI signals via textbox that Zumo has reached end of corridor via textbox message and “R” button is pressed to rotate the Zumo 90 degrees clockwise before continuing auto navigation.
* “STOP!” button is pressed when Zumo is outside of the first room.
* “ENTER ROOM MODE!” button is pressed, this lets the Zumo know that the “L” and “R” buttons are now indicating a room in that direction instead of a corner turn, GUI textbox also informs the user of this.
* “L” button is pressed to begin room navigation to the left of the Zumo, the Zumo checks the rooms with proximity sensors and sends a message to the GUI text box, numbering the room, indicating the rooms direction from the corridor, and informing the user that the room is occupied (by the mug placed inside). These values are stored so that the Zumo remembers where each room is and the properties of each room.
  + My Zumo robot’s proximity sensors are really sensitive, and it will not drive into a room with an item inside it will just detect it immediately, this is why the robot does not drive into the room
* “GO!” button is pressed to continue auto navigation after the Zumo has finished checking the room and has returned to facing towards the end of the corridor.
* The above steps are repeated for stopping and checking the second room, this room was empty, so the robot drove the full distance into the room until it was stopped by its line sensors and used its encoders to reverse the same amount.
* “GO!” button is pressed to continue auto navigation after the Zumo has finished checking the room and has returned to facing towards the end of the corridor.
* “L” button is pressed to rotate the Zumo 90 degrees anti-clockwise before continuing auto navigation down the left turn of the T-Junction.
* The third room is checked the same way as before.
* “GO!” button is pressed to continue auto navigation after the Zumo has finished checking the room and has returned to facing towards the end of the corridor.
* At the end of this corridor the “BACK!” button is pressed to begin a 180 degrees turn before beginning its backtracking to the T-Junction, the GUI informs the user that the controls will be locked for the duration of the backtracking
* I attempt to press the “STOP!” button outside of room 3, this button input is ignored as the Zumo is still currently backtracking and has not passed the T-Junction yet.
* Once the Zumo passes the T-Junction the GUI informs the user that control has been returned, and “STOP!” button is pressed outside of room 4 to begin the process of checking the room once again.
* “GO!” button is pressed to continue auto navigation after the Zumo has finished checking the room and has returned to facing towards the end of the corridor.
* “HOME!” is pressed to begin the Zumo robots retracing of its steps to return to the beginning of the maze. Things to note about the Zumo returning home:
  + I made it so that the Zumo pauses outside each room, this demonstrates that the Zumo has stored the rooms’ locations and knows where they are on the path back, it however does not re-enter rooms 2,3 and 4 as they were empty when scanned the first time.
  + When the Zumo re-enters room 1 and detects that the object is still inside it lights up a green LED on the rear of the robot and beeps continually until it reaches the end of the maze. These are used as a following signal for the objects of the maze to follow the robot out of the maze.