

INSTRUCTIONS FOR THE EXERCISE

- Connect the left and right IR sensors to the Crickit signal pins.
- Connect the ultrasonic sensor to the CPX or Crickit for distance measurement.
- Attach the servo motor to the front of the rover to push obstacles.
- Connect both DC motors to the Crickit motor ports.
- Upload the CircuitPython code to the CPX.
- Place a black line on the floor for the rover to follow.
- Place small obstacles in front of the rover's path.
- Observe the rover follow the line using the IR sensors.
- When an obstacle is detected, observe the rover stop and push it away using the servo.
- Notice how the rover resumes movement after the obstacle is cleared.

PSEUDOCODE

Start the program

Set up the Crickit seesaw interface

Set left IR sensor and right IR sensor as digital inputs

Set up ultrasonic sensor for distance measurement

Set up left motor and right motor

Set up servo motor for pushing obstacles

Define movement functions

- Move forward

- Turn left

- Turn right

- Stop motors

Define a function to push obstacles using the servo

Set last movement state as none

Repeat forever

- Read distance from ultrasonic sensor

- If distance is less than the safe limit

 - Stop the rover

 - Push the obstacle using the servo

 - Wait for a short time

 - Skip the rest of the loop

- End if

- Read value from left IR sensor

- Read value from right IR sensor

- If both IR sensors detect the line

 - Set movement state to forward

- Else if left IR sensor detects the line and right does not

 - Set movement state to turn right

- Else if right IR sensor detects the line and left does not

 - Set movement state to turn left

- Else

 - Set movement state to stop

- End if

- If the movement state has changed

 - Run the corresponding motor function

 - Update the last movement state

- End if

- Wait for a short time

End repeat