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| **العربية** | Communication and Electronics Department Introduction to Mechatronics - EEC 331  Fall 2023 - 2024 |

REPORT

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| **Section:** | 1 & 8 |
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* **Introduction:**

-The aim of the project is to design a very simple automotive vehicle that runs using an Arduino microcontroller. Our vehicle will run using two wheels connected to two motors and a free wheel.

* **Implementation:**

**-To implement this project the following hardware tools were used:**

- Arduino.

- Two wheels.

- A free wheel.

- Two gear-boxed DC motors.

- Motor driver.

- Ultrasonic sensor.

- Wooden chassis.

- The main idea is that the car will move in a straight line with a constant velocity until the ultrasonic sensor recognizes an obstacle a few centimeters ahead. On recognizing an obstacle, the vehicle should stop moving however, we added a feature where it will move backwards on recognizing an obstacle certain centimeter ahead.

* **Code:**

As mentioned earlier, an Arduino kit was used in implementing the hardware. In the following lines, parts of the code will be explained to demonstrate the software implementation.

The first part of the code is the macros and variables. The macros are used to define each component pin number to enhance the readability of the code. The variable is used for storing duration and distance for the ultrasonic.

A screenshot of a computer

Description automatically generated

The setup function is used to set the pin modes for each component, using the ultrasonic sensor and the constant speed of the motor.

A close up of text

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This is the main code, in the beginning of the loop function, we call the function for the calculations of the distance between the vehicle and any obstacle, if the distance is more than the minimum distance the vehicle will move forward elsewhere it will stop then move backward then move in the left direction.

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The last part of the code is the implementations of the used functions in the main code.

A screenshot of a computer program

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A screenshot of a computer code

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