Overview

- The project is obstacle avoiding car, the code follows the layered architecture method (MCAL, HAL, APP) layers.

- Most drivers are meant to be generic to achieve portability or, it can be used with other projects.

Components

- Atmega32
- CLCD 2x16
- L293D
- DC Motors
- Ultrasonic HCSR04
- Servo Motor

Atmega32 Peripherals

- DIO
- Timer1
- GIE

Components Details

- The ultrasonic is used in the project to measure distance by sending ultra waves, with the help of sending a 10 microsec pulse to the trigger pin. and listening to the echo pin signal to calculate distance.

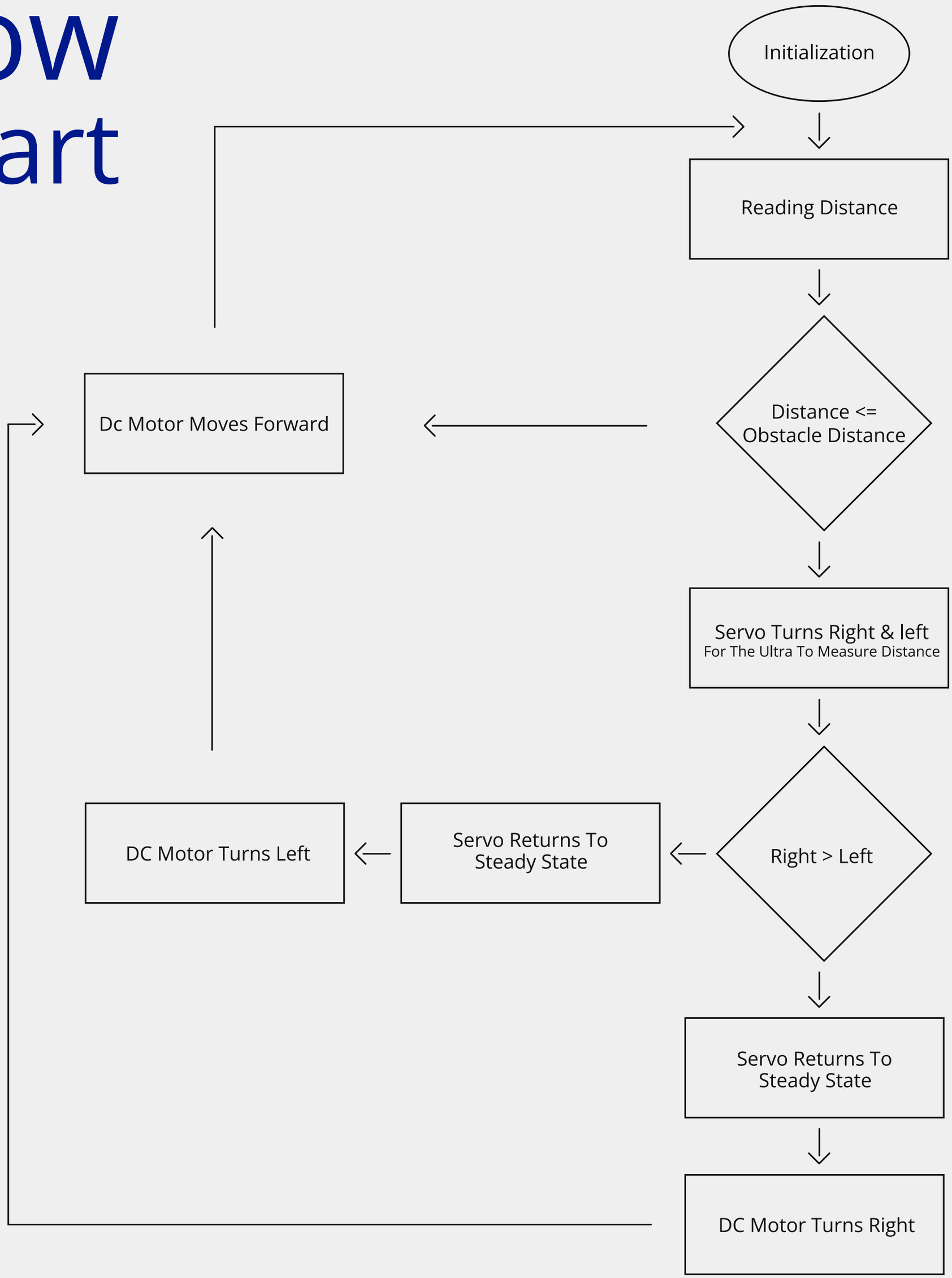
- The servo motor has a precise motion used to direct the sensor to both right and left direction.

- Dc motors are essential for the car movements.

- CLCD display is for displaying car direction and measured distance.

- Atmega32 is the controller of all mentioned component with the most important peripheral that’s timer1. Basically it sends the waves needed for the servo motor to properly operate by setting the frequency to 50 hz and the duty ratio values according to the direction.

Flow Chart


Initialization
Reading Distance
Distance <= Obstacle Distance
Dc Motor Moves Forward
Servo Turns Right & left
For The Ultra To Measure Distance
Right > Left
Servo Returns To Steady State
DC Motor Turns Left
Servo Returns To Steady State
DC Motor Turns Right