DIY

TEAM-6

ARDUINO MARBLE MAZE LABYRINTH

TEAM MEMBERS

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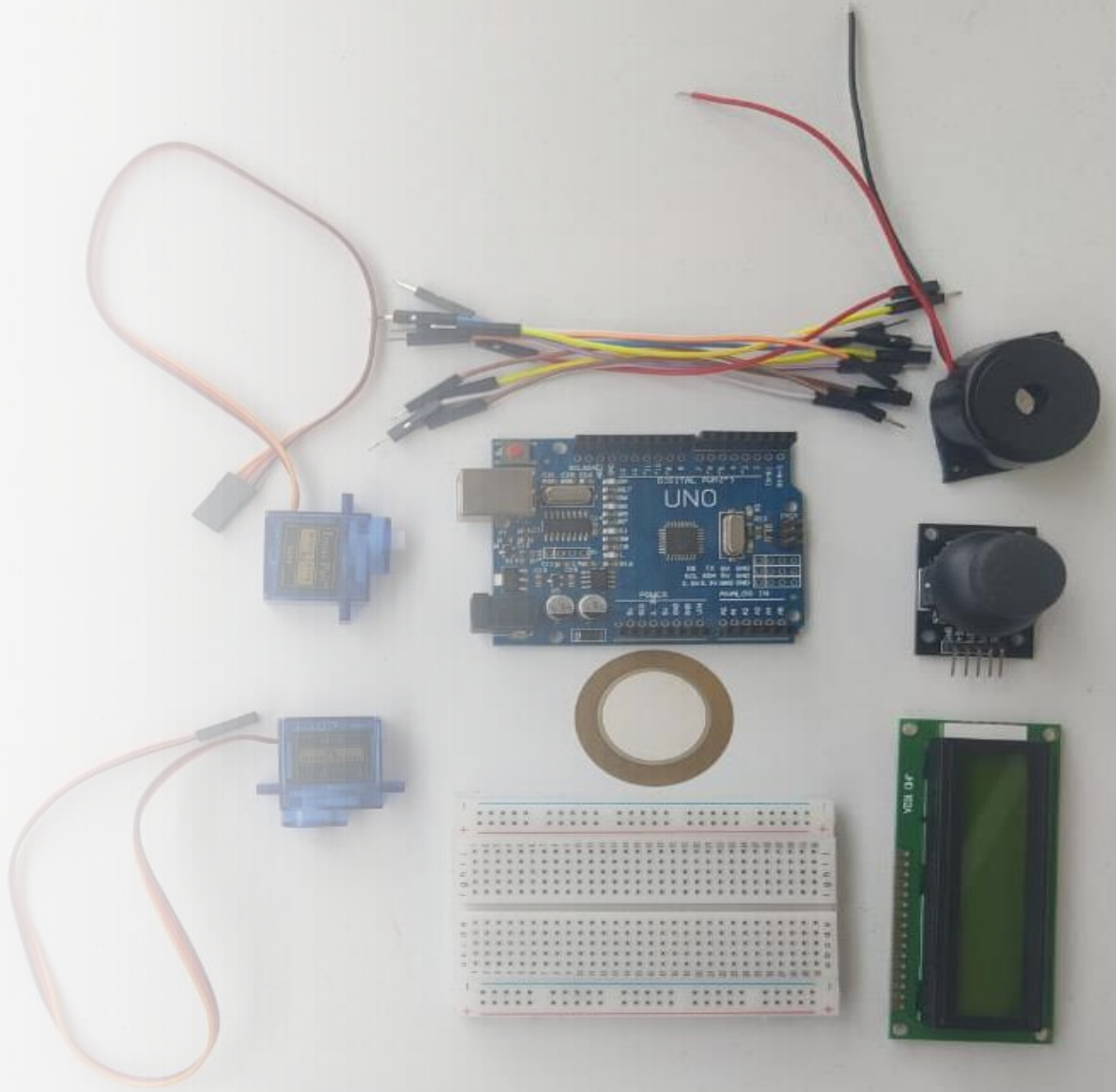
About the project

This is a simple Arduino project to control a marble maze. The idea of the game is to navigate the marble through the maze to reach the portal at the end to win the game.

Developing a child's creativity and skills is a goal of every attentive parent. And toys are a perfect way to do that. Playtime doesn't have to be wasted time. Our project will be a fertile ground of learning and expansion of mental, and physical skills.

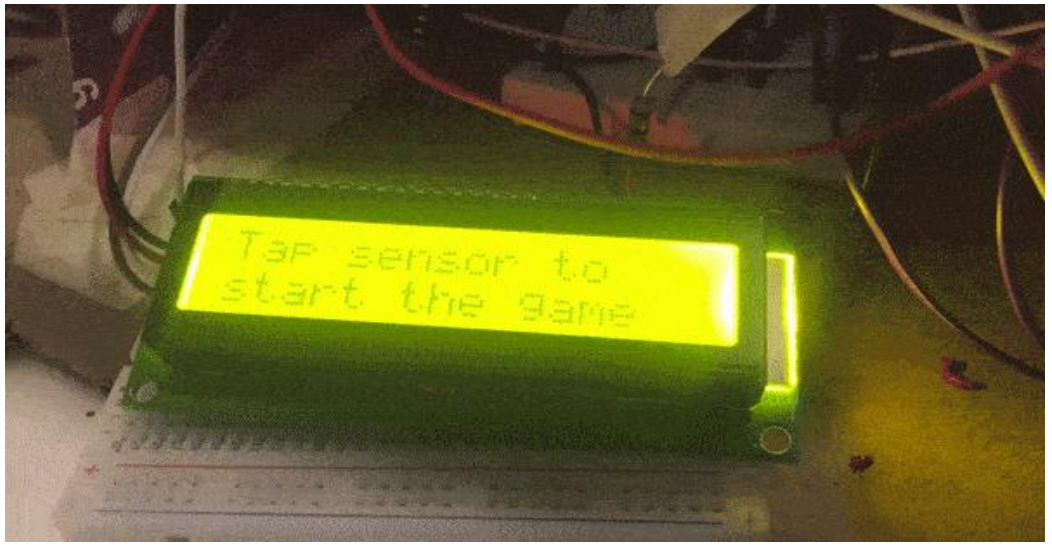
Components

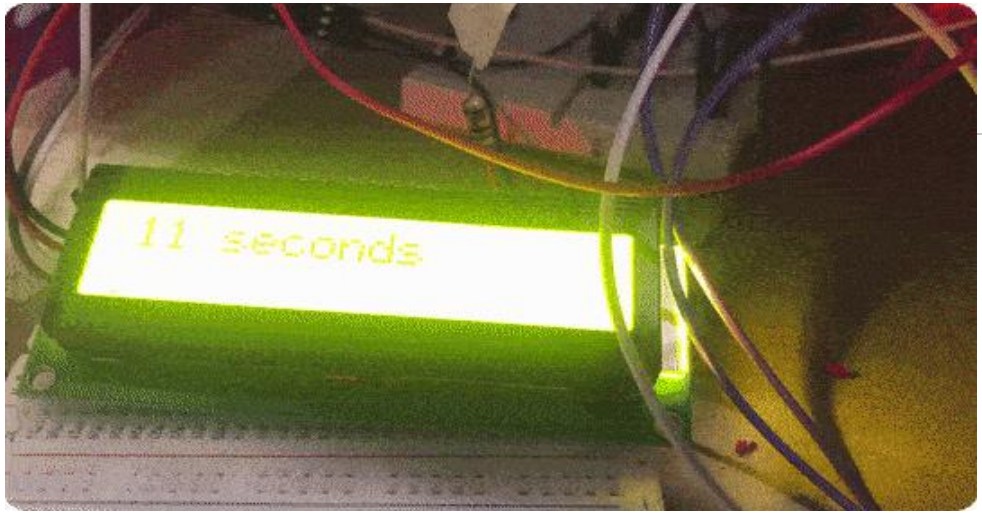
- Arduino uno
- Two SG90 micro servo motors
- Modulo joy stick
- Piezo element
- Piezo buzzer and LED's
- Breadboard
- 16 X 2 LCD display with I2C module
- Jumper wires
- Corrugated sheets of cardboard
- 2 in screws and a marble



PIEZO ELECTRIC SENSOR

Piezo electric sensor is attached at the end point of the maze. It detects the pressure exerted on it when the marble falls on it and gives the output as instructed in the code.



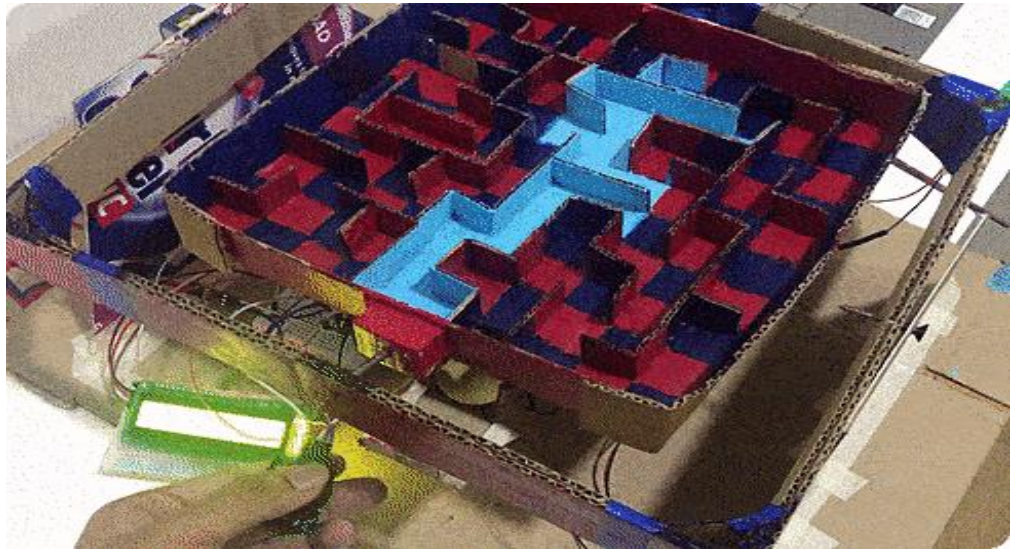


LCD SCREEN (with I2C Module)

- An LCD Screen with I2C Module is attached to the Arduino to display the time taken by the player to complete the game and display score according to the time.

JOYSTICK and SERVO MOTORS

Joystick and the servo motors are the main components which help in rotating the maze box in the required direction . Two servo motors are for rotation in two axes and a joystick for giving input signals in the form of analog signals which in turn control the servo motors.



SPEAKER and LED's

We have attached a speaker for playing music during the game(till it reaches the end point) and some LED's which change their mode, right after the ball has reached the end point.

ALGORITHM

- **reading2** is the reading of the piezo sensor kept at the endpoint.

This will be in a loop

LCD displays the message"Tap sensor to start the game."

Program waits for the input from piezosensor1(start button)

After tapping start button(piezosensor1)

If(reading1>thres1) timer will be started, buzzer and LEDs are also triggered.

If(reading1<=thres1)

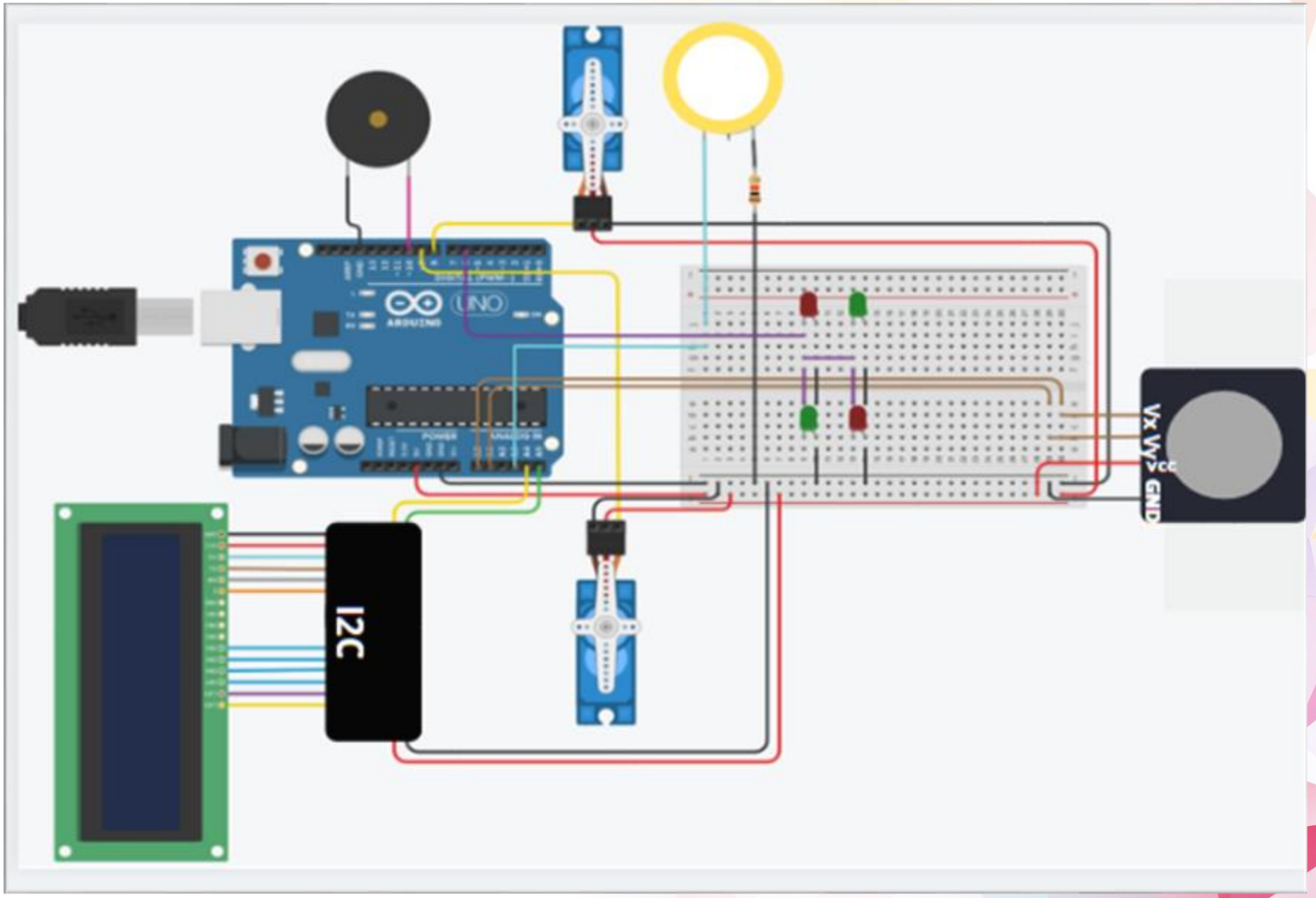
(reading2>thres2)implies marble has reached endpoint.

If(reading2>thres2) music and timer will be stopped and displays timetaken,score,highscore.

If(reading2<=thres2) waits untill reading2>thres2

Waits untill (reading1>thres1)

- **In this loop itself, inputs from joystick will be taken and motors are rotated accordingly.**



Schematic Circuit Diagram

Project timeline

Week 1

Made cardboard maze model, and bought the required components.

Week 2

Worked mainly on the coding part and learnt about the circuit connections.

Week 3

Made the final model by connecting the circuit and fixing it to the cardboard setup.

Work Sharing

- **Hardware team**

  Vachan Siddharth and Sai Sankar

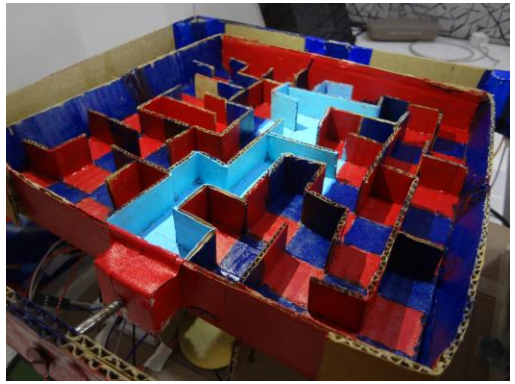
  - Made the circuit connections and helped in coding.
  - Built the setup of the game using cardboards.

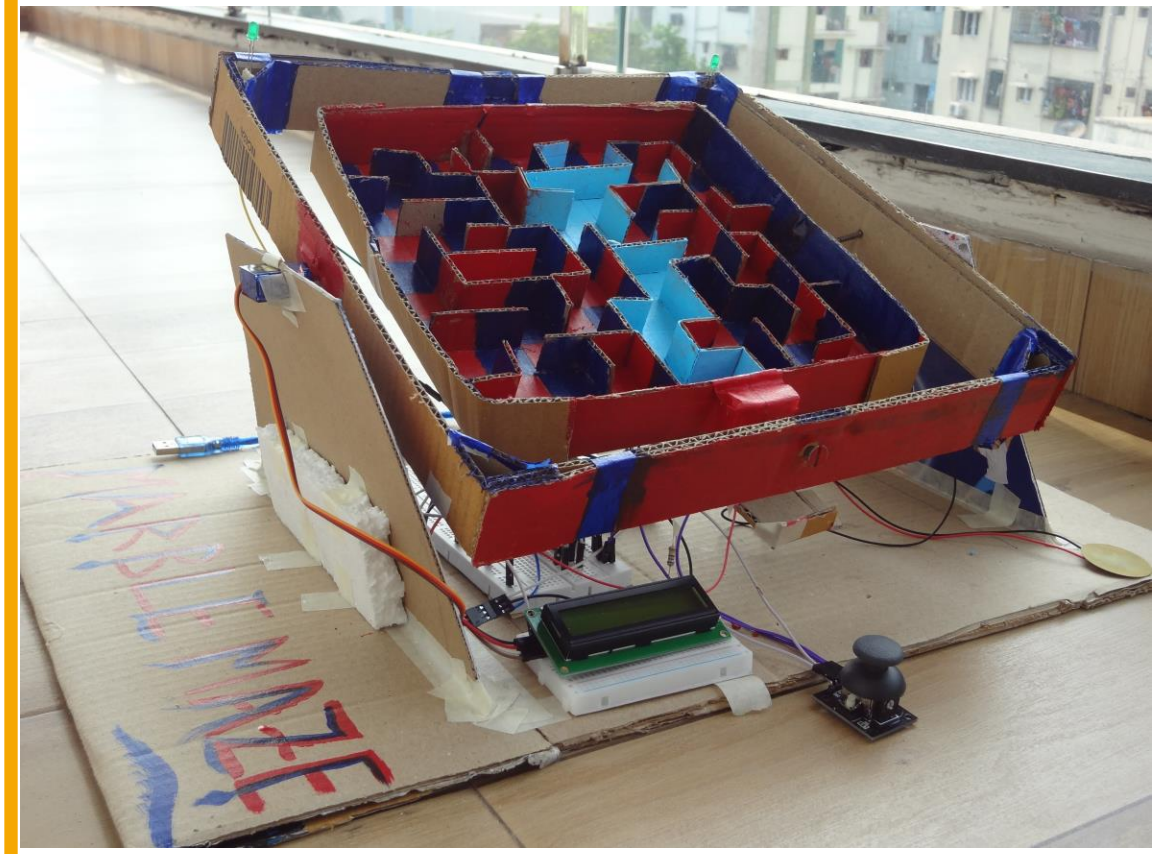
- **Software team**

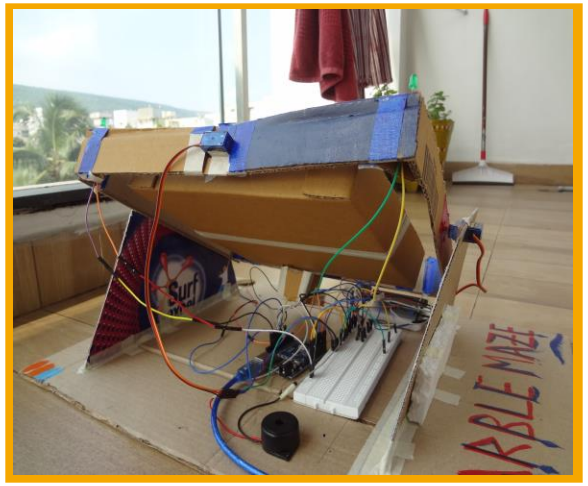
  Mohan Krishna and Paul Pradeep

  - Modified the code for the servo motors and music and piezo sensor.
  - Worked on the code for showing timer, score and high score in LCD .

❖ Presentations and Project report are done together.







THANK YOU