Arduino Marble Maze Labyrinth

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**Team members**

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# Introduction and significance of the project

Marble maze game is a classic and exciting project made using basic Arduino components. The idea of the game is to navigate the marble through the maze to reach the endpoint to win the game. Our team made this fun project for people who enjoy physical skill games made using technology.

# Statement of the problem

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 for learning and expansion of mental and physical skills. ​

# Procedure and results

After digging so much about projects with Arduino on the internet, we have finalized this maze game and discussed among ourselves about the components required, the work-sharing part, and about the extra features we would like to add like music, LED’s and displaying the score and high scores, time taken etc...

* In week1, we managed to buy (offline) all the components required and worked on making the maze box, base for the game, and supports.
* The software team had modified the code for coupling servo motors with joystick and worked on the code for playing music during the game and piezoelectric sensor required at the endpoint for detecting the marble.
* In week2, we mainly engaged ourselves in the coding part and learned about some basic functions in C++ required for us. While working on it, we encountered a problem in playing the music in the background.
* The problem with playing music is that it is causing a delay in taking the inputs from the joystick, which has made the movement of the maze box slow and unsteady.
* We have finally overcome this problem in the third week. Initially, we had thought of using the attachInterrupt() function but it resulted in a very weird response from servo motors and we have noticed that increasing the amount of rotation for one signal has solved our problem. So, we have done it like that. We have also attached a sensor, which on tapping will start the timer.
* After fixing all these components, there would be many wires, and now to attach the LCD will take another 12 wires. So, we have soldered an I2C module to the LCD to reduce the wires and it is very easy to connect.
* Finally, we have also made the code in such a way that the music will stop and LEDs will stop blinking after the ball has reached the endpoint.

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# Limitations of the product and solutions

The whole model was made using cardboard which is relatively weaker than the materials like plastic. This is causing some instability with the maze. So it is better to use stronger materials.

As we are using piezoelectric sensors to detect the vibration produced by marble. Accidental shaking must be prevented which would mislead the sensors.

# Conclusions

The Marble Maze that we made has been working perfectly. As an improvement to the product which is already available in the market, we have added LCD, piezo sensor, buzzer, etc... We as a team have learned many things during this project. It’s been a wonderful experience throughout.