SNAKE GAME

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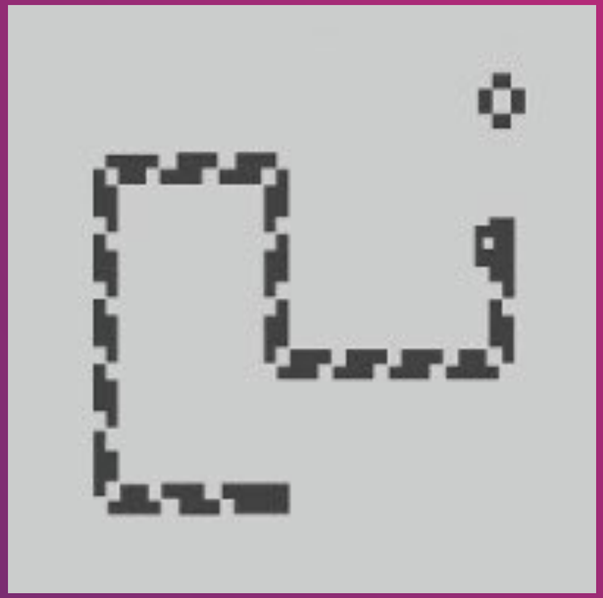
Abstract

The main goal of this project is to design and implement a snake game with an Arduino Uno. The game can be played on a dot matrix by using a joystick. We used Arduino IDE to implement codes with C++ programming language.

Introduction

- Snake game is a very popular video game that a player maneuvers a line called a snake and it grows in length when it reaches (eats) a dot (apple). It is originated in 1976 and become very popular with Nokia mobile phones in 1998.
- The aim of the game is simple. The player moves the snake and it tries to eat apples as much as possible. The length of the snake grows with each eaten apple. When the snake becomes longer, it becomes hard to control it. If the head of the snake hits any part of its body, the game ends.

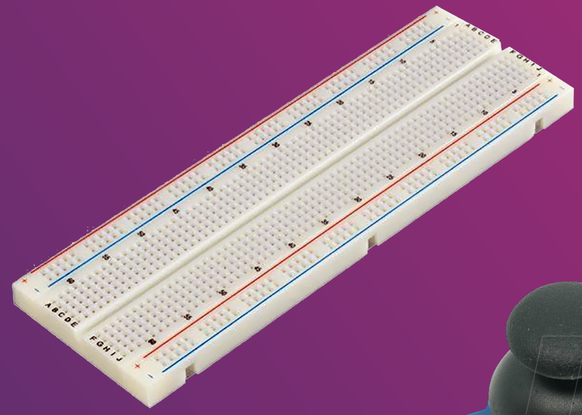


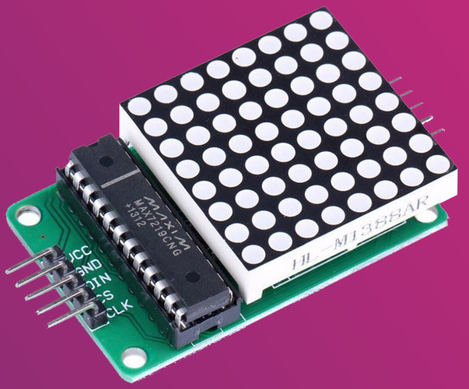
Project Details

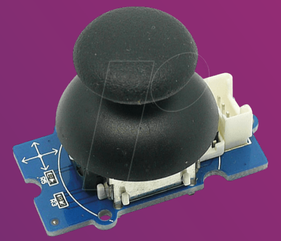
- In the implemented circuit, primarily the screen displays a scrolling text which is "Press Start".
- A player can press the push button of the joystick to start the game. The game starts with displaying an apple which is randomly set on a place and a snake moving on the led matrix, with a fixed starting length.
- The player can control the snake by moving the joystick through the x and y-axis. Each eaten apple grows the length of the snake. When the snake becomes larger the death possibility of it increases.
- The player tries not to collide the head of the snake with its body. If it collides, the game ends, and the "Game Over" text is displayed on the led matrix. Subsequently, the game restarts the snake and turns to beginning with displaying the "Press Start" text again. The player can play the game again by pressing the joystick’s push button.

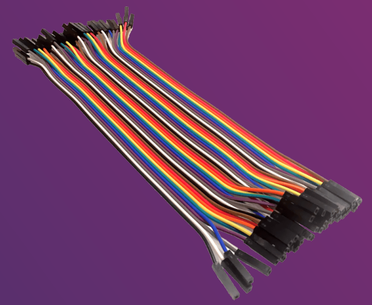
Project Components

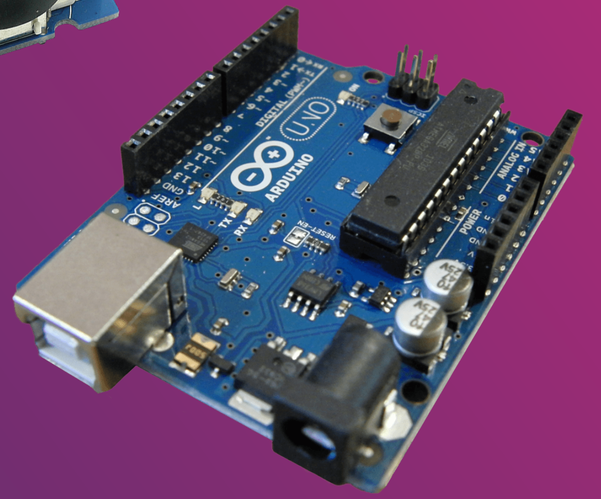
- Arduino Uno
- USB A-B Cable
- Breadboard
- Thumb Joystick
- 8x8 LED Matrix
- Jumper Wires
- Max 7219 Dot Matrix Module











Circuit Pin Tables

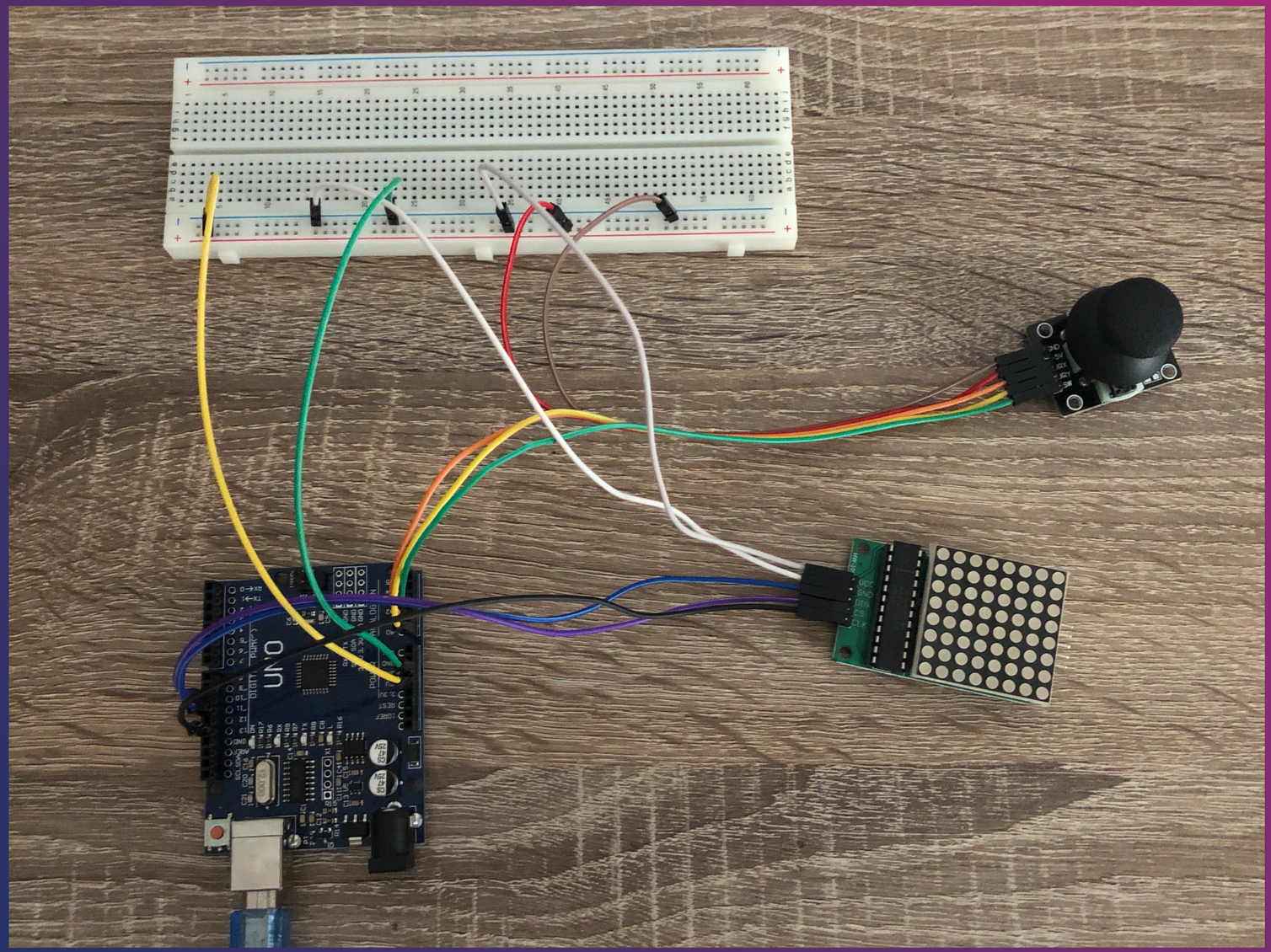
Joystick Pin	Arduino Uno Pin
GND	GND
+5V	5V
VRX	A1
VRY	A0
SW	A2

Table 1: Connection pins of Joystick and Arduino Uno

Led Matrix Pin	Arduino Uno Pin
VCC	5V
GND	GN
DIN	11
CS	10
CLK	13

Table 2: Connection pins of LED Matrix and Arduino Uno

Circuit

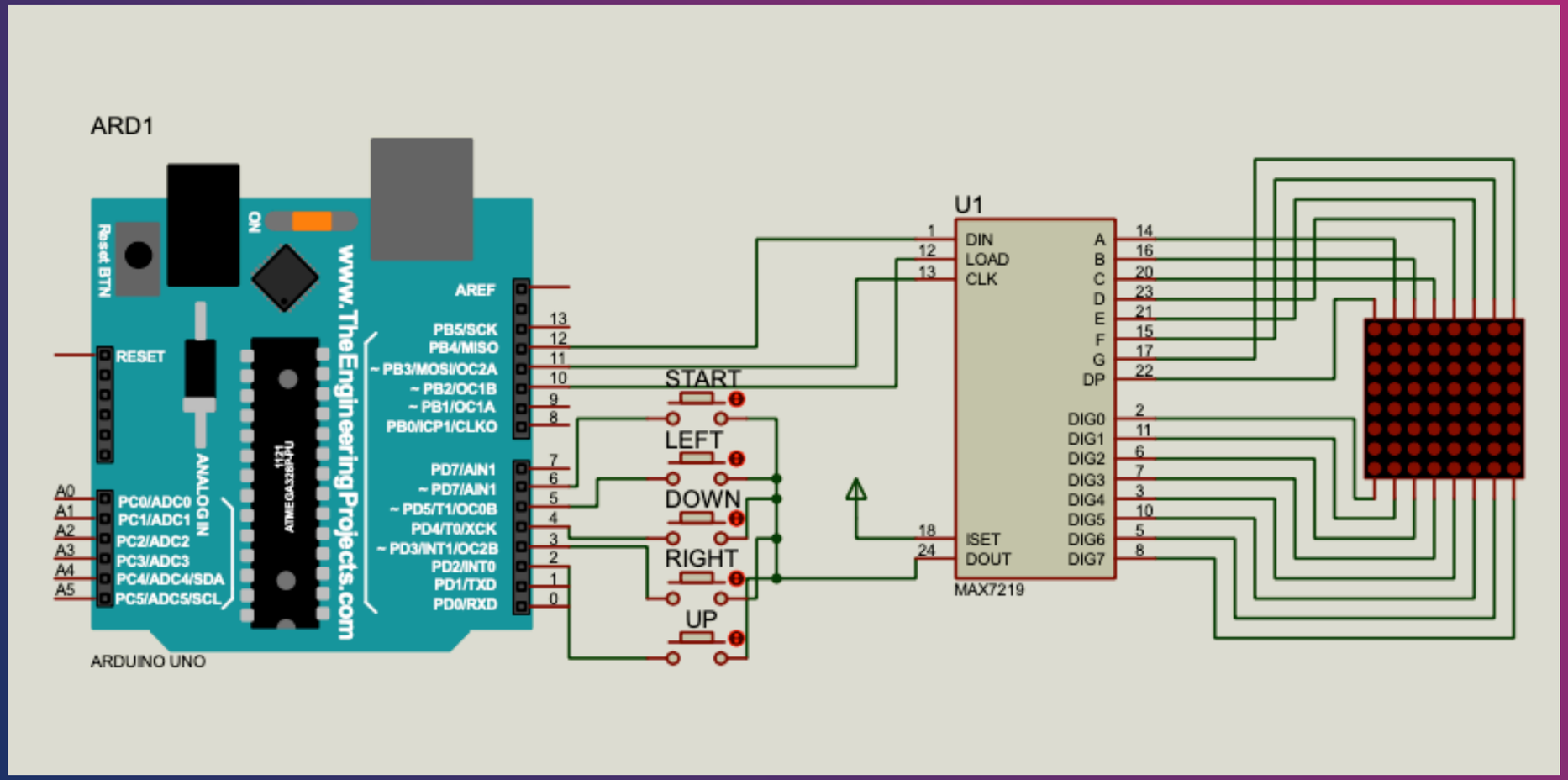


Simulation

- In the implementation of the simulation, we used Proteus software which is a proprietary software tool suite used primarily for electronic design automation.

- The project components are an Arduino Uno, an 8x8 LED matrix, a MAX7219 dot matrix module, jumper wires, and a thumb joystick. But thumb joystick was not available as a component in simulation environments. Instead of it, we used 5 buttons to simulate the game. These buttons able the player to start the game and move the snake to left, right, up, and down.

Simulation Diagram



References

- https://en.wikipedia.org/wiki/Proteus_Design_Suite
- https://en.wikipedia.org/wiki/Snake_(video_game_genre)