IoTLab

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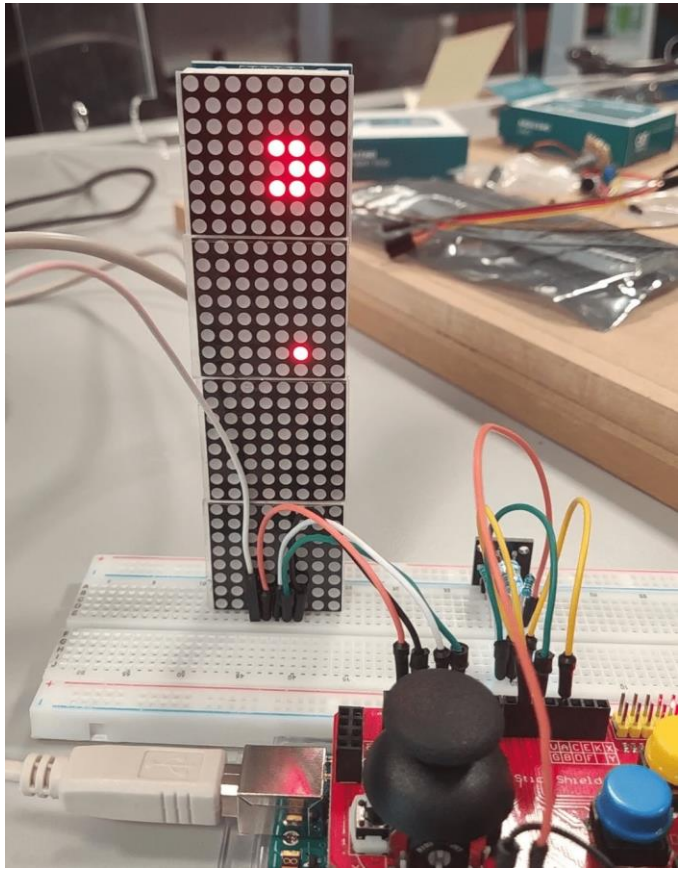
# 2D plane mini game

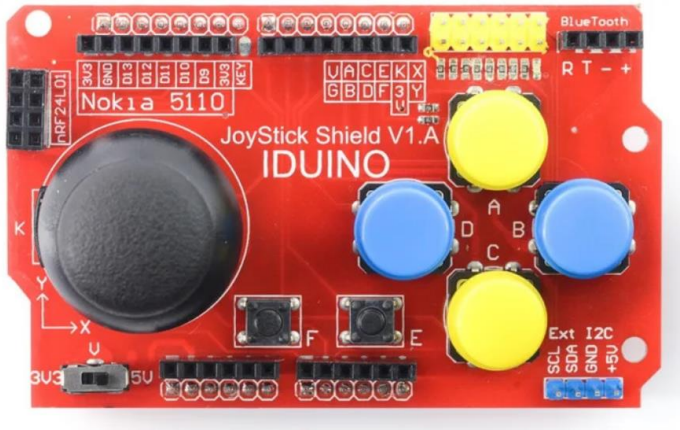
Features of the game:

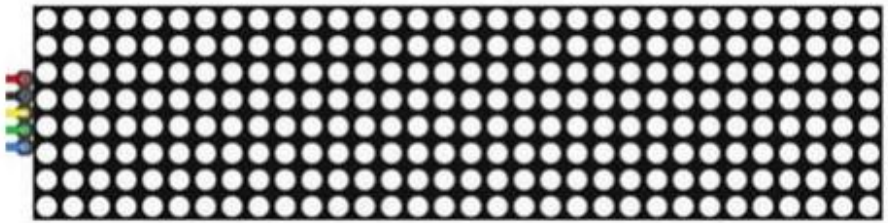
- move the plane on the battlefield (display)
- shoot
- target (can be destroyed or can destroy the plane)
- generate new target
- RGB led (changing colors with different events)



# Components

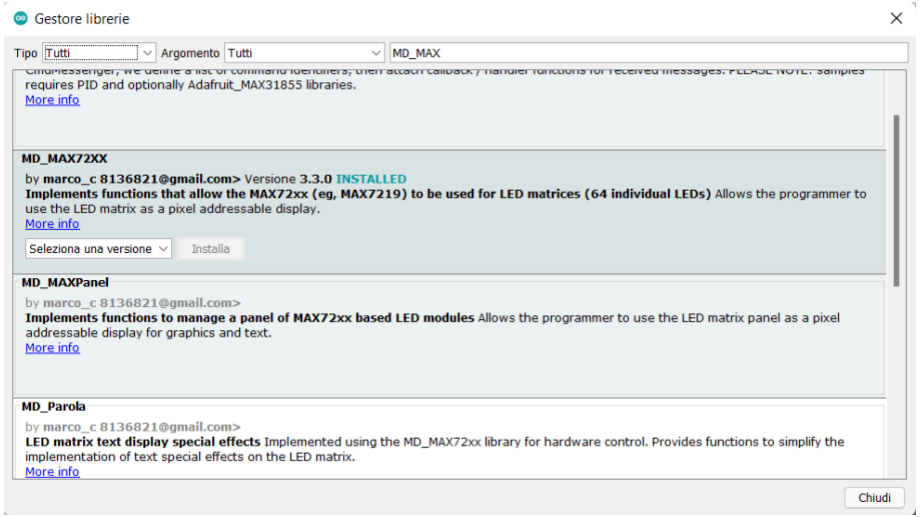
- Arduino Uno
- 8x32 Led Matrix (Output)
- JoyStick Shield V1.A (Input)
- RGB Led (Output)
- 3 x 220 ohm resistor



# Libraries

- MD_MAX72XX (8x32 Led Matrix)



# RGB Led

- set color to white at the start of the game
- change color to red when plane crash into the target
- change color to green when plane hit the target while shooting

# Code functionality

- program store main informations about plane, target and bullet (in case of shooting) in global variables:
  - current coordinates
  - current Led Display (1 of 4)
  - direction (just plane)

```
// center coordinates of the plane
int plane_x;
int plane_y;
int planeCurrentDisplay;

// direction of the plane
int planeDirection;

// direction constants
const int LEFT = 0;
const int RIGHT = 1;
const int UP = 2;
const int DOWN = 3;
```

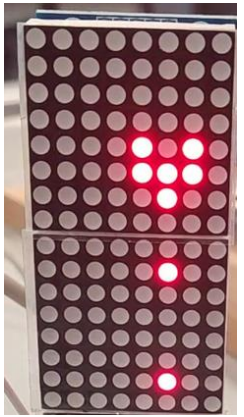
```
// target coordinates
int target_x;
int target_y;
int targetCurrentDisplay;

// bullet coordinates
int bullet_x;
int bullet_y;
int bulletCurrentDisplay;
```

# Code functionality - moving a plane

- with every move signal from the joystick, program:
  - check whether plane is not going behind the edge of the display
  - check whether plane did not crash into the target
  - draw plane in the specific position and direction

# Code functionality - shooting

- 1. program set bullet plane’s coordinates
- 2. program change bullet’s coordinates in the direction of the plane (with delay)
- 3. with every change of the bullet’s coordinates, program checks:
  - whether bullet did not go behind the edge of the display
  - whether bullet did not hit the target



# Code functionality - generating the target

- program generate new coordinates of the target using method “random(min, max);” in one of the 8x8 Led matrices where is not current location of the plane

# Code functionality - displaying objects

- after every input signal from the joystick, program display plane, target and in case of shooting also bullet on the Led display

# Thanks for your attention