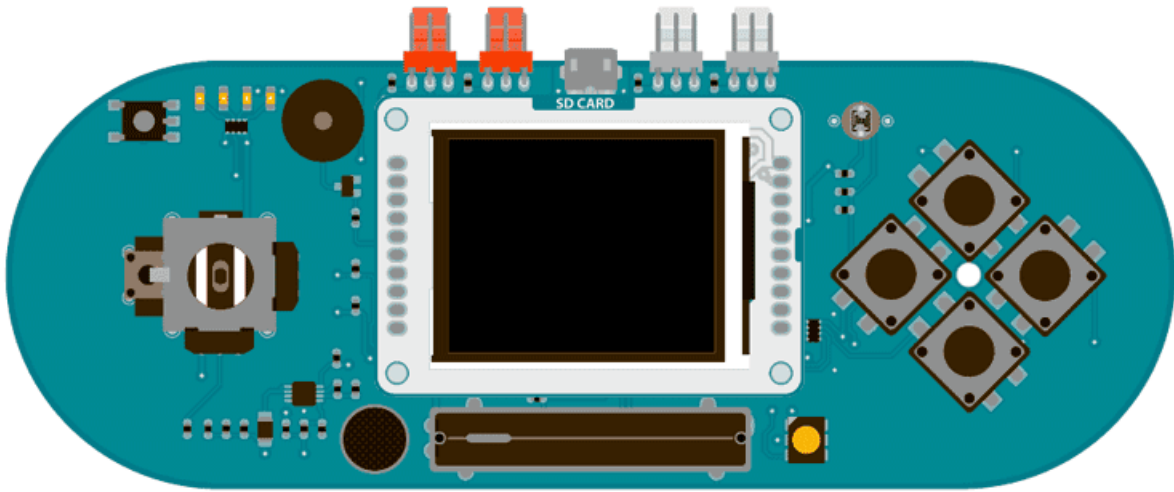# BrainTester

using Esplora's buttons and display

Project description: The BrainTester project comprises a memory game and a math game, both of which will be operated through the Esplora buttons and TFT display on the Arduino Esplora platform. The game will include multiple levels, each progressively more difficult than the last. To progress to the following level, the player must accurately replicate a sequence or solve a mathematical equation in each level.

Game modes:

1. In the Random LED Flashing mode, the screen will randomly flash one of four lights, and the player must accurately identify which lights were illuminated. As the length of the light sequence increases, the difficulty level increases.

2. In the Mathematical Operations mode, four arithmetic operations (+, -, *, /) are randomly generated, and the player must accurately solve them by selecting one of three potential answers. The level of difficulty increases in correlation with the complexity of the mathematical operations

Components used:

- Arduino Esplora
- TFT display
- Esplora's buttons
- Esplora's built-in led

Proposed data structures:

- Two global variables to store the player's maximum score in each game mode.
- An array is sufficient to store the sequences for the memory game.

Finit-state machine of the game

right

Main menu
-->Math game
LEDs
Score

down

up

INCORRECT!
HIGHEST SCORE: XXXX
-->Main menu

Main menu
Math game
-->LEDs
Score

down

up

Incorrect
answer

right

Main menu
Math game
LEDs
-->Score

right

Incorrect
answer

Each of "1" and "2" arrows represents actually two arrows: "right" pressed and correct answer OR "right" pressed and incorrect answer . If "2" arrow and correct input also increase difficulty

right

Led
game

left

2

+

1

/

-

1

*

1

Correct
answer

HIGHEST
SCORE
1: XXXX
HIGHEST
SCORE
2: XXXX

Each opertation
can be represented by below
diagram

Each led game can be
represented by below diagram

Blink one of
four colors.
D times.
Where D is
diffuculty
level

Blinked D
times

*Color
blink*

X + Y =
-->A
B
C

up

down

Correct
answer D
times.

X + Y =
A
-->B
C

up

down

Input *D* colors:
If correct color inputed blink
Esplora's led green
Else red

If correct color
inputed, and less
then D colors
inputed, get one
more color

X + Y =
A
B
-->C

User trires to repeat the
sequence by pressing buttons:
"up" [means red]
"right" [means green]
"down" [means blue]
"left" [means yellow]