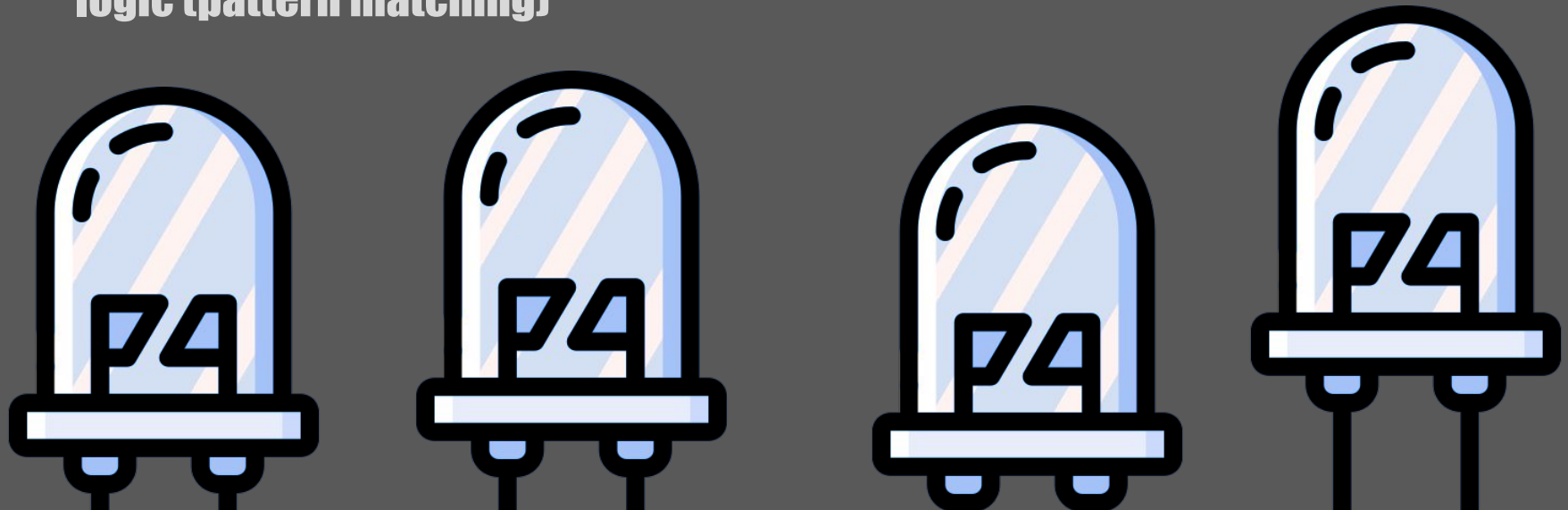
Brain Master

Robert Pearce

Dr. SJ (Project Mentor)

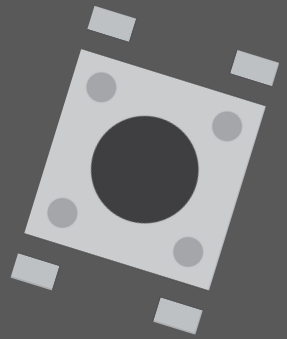
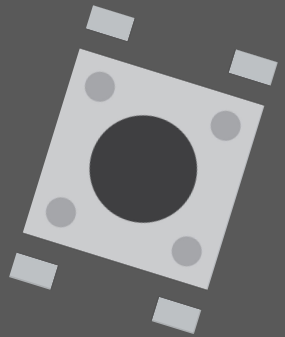
Overall Goal of the Project

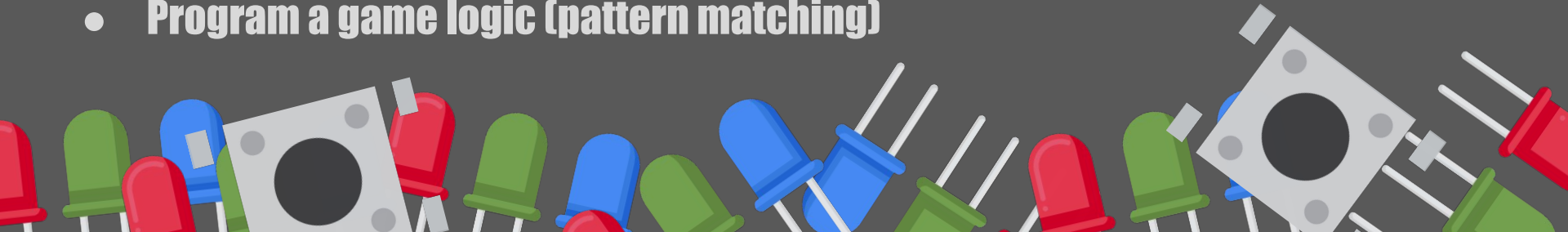
- To help students learn STEM (w/ focus on technology)
- To utilize a digital system for saving and retrieving data as part of the game logic (pattern matching)



Activity

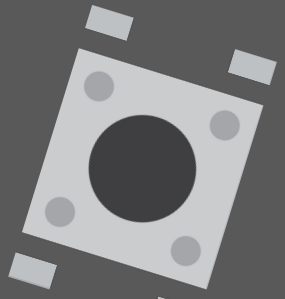
- Game logic development (design of a physical computing game)
- Program digital input with switches
- Program digital output with LEDs
- Program analog output with a buzzer
- Program a game logic (pattern matching)

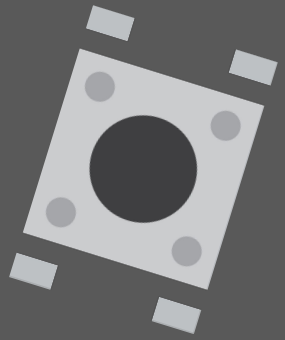






Sub-tasks

- Program digital input/output with switches and LEDs.
- Students will configure circuits with switches and LEDs.
- Students will implement the array data structure to use switches and LEDs in game logic.





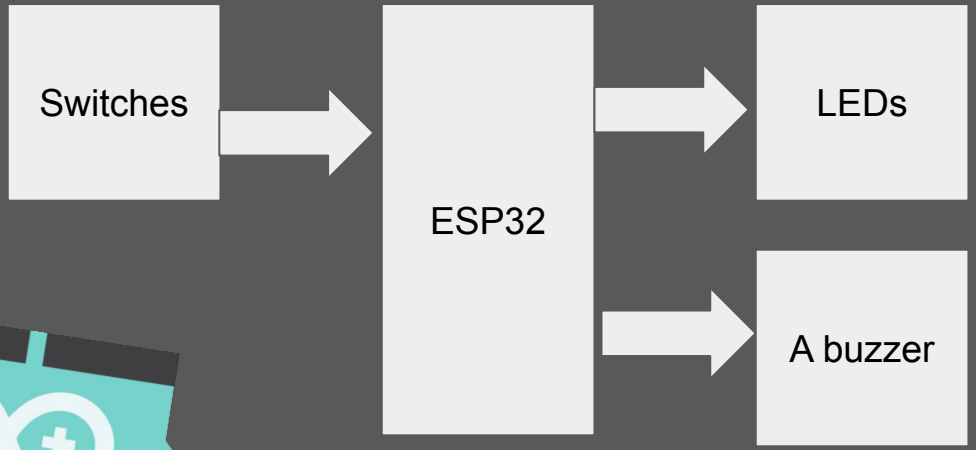
Sub-tasks

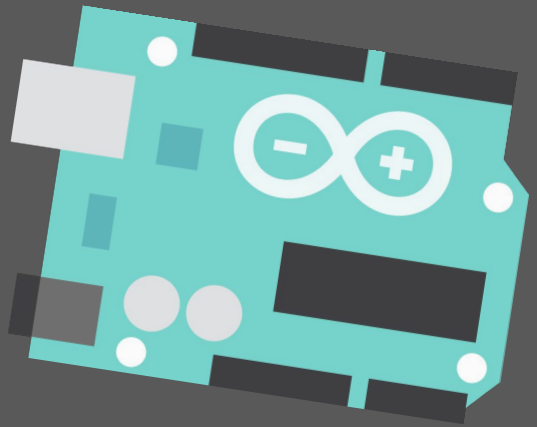
- Program analog output with a buzzer.
- Students will learn how to generate sound with a buzzer.
- Students will declare const variables that represent music notes to create a melody.

Sub-tasks

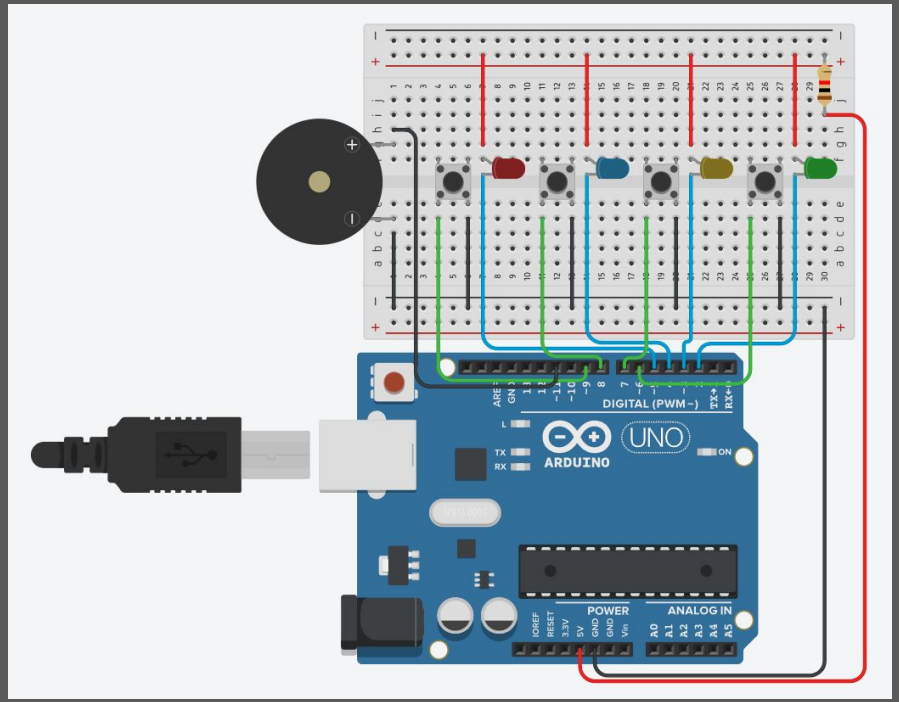
- Program a game logic (pattern matching).
- Students will learn about pattern matching.
- Students will implement arrays to check a randomly generated pattern vs user input.

Hardware Setup

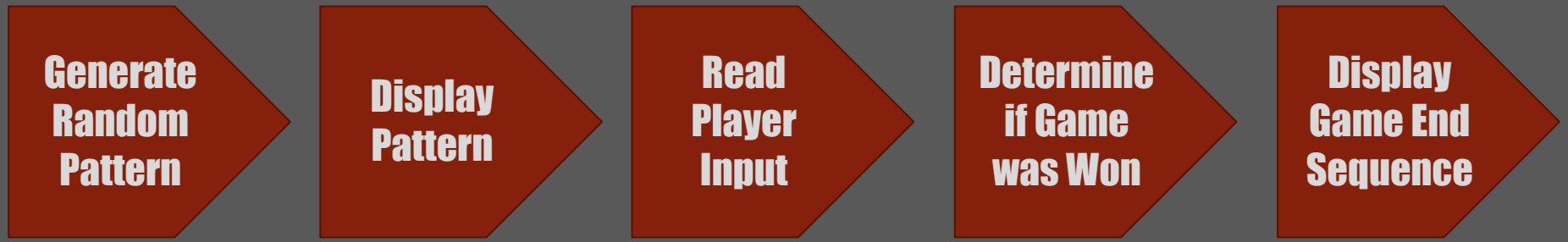




Circuit Design



Software Development



Software Libraries ...

- None :)

Testing and Calibration

- Project will be divided by the modules (input, output, game logic) and provided to students to complete.
- Testing and calibration will be conducted:
  - By module (assigned student)
  - On a timely manner (2 times per day)

Integration and Deployment

- Integration will be performed on Day 3 of the project week.
- Deployment will be on one of the student's laptop.
- Housing will be made if time allows.

Final Testing

- Pre-final testing will be scheduled on Day 3
- Final testing will be on the day before of the project demo day

Documentation

- Daily documentation of progress.
- Shared Google document.
- Github repository to track code progress.

Presentation

- Google slide will be used.
- Will take photos on a daily basis as the project development progress.
- Each member will have a portion for presentation.
- Minimum 3 practice - Dry Run , 1 day before of the pt day, and in the morning of the presentation.

Mentor Plan

Day	Plan	Outcome
Day 1 (6/3/24)	Project intro and discussion Project design (sketches, game logic diagrams, and role assignment)	Project document (sketches, diagrams, etc.)
Day 2 (6/4/24)	Project implementation (60% of 100%) - Digital Input/Output (Switches, LEDs, Buzzer) - Game logic (50%)	Project document ESP32 Code
Day 3 (6/5/24)	Presentation dev (90%) Project implementation (90%) - Game logic (50%)	Project document ESP32 Code
Day 4 (6/6/24)	Project dev (100%) and test Presentation dev (100%) Presentation dry run	Project document ESP32 Code Video clip
Day 5 (6/7/24)	Presentation practice Project PT	