Lights, Sounds, Code!
Software Engineering Extravaganza

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a different opinion

Foreword

This contest is limited to four entries per school. Working in teams is encouraged but individual participants are allowed. The maximum team size is five participants.

Each school MUST complete a Fair Registration/Competition Entry Form and return it to the Oklahoma Engineering Foundation Office (OEF) office by Jan. 19, 2024. Prizes will be awarded to winning entries from registered schools (entries from unregistered schools will NOT be eligible for prizes).

Design Statement and Objective

Prior to the competition, use the provided basic programable logic controller to create a unique automated display using visual and audio components that is triggered via a physical input. The overall objective is to create an entertaining automated show. For example, a model home holiday display with light and sound. Code should be well documented, readable and bug free. Code should incorporate SOLID principles when practical (https://www.educative.io/answers/what-are-the-solid-principles-in-java).

Materials and Restrictions

American Fidelity will provide the programable logic controller kit to be used for this competition. A materials allowance of $50 will also be provided. The total project budget (excluding the materials provided) cannot exceed $250.

Requirements

- Max dimensions of the completed display are 3ft x 3ft x 3ft.
- There needs to be an interactive trigger to start the display.
- There needs to be the ability to pause the display. Pause will stop the show and pushing start will continue from where the display was paused.
- There needs to be the ability stop the display. Stop will end the show and pushing start will re-start the show from the beginning.
- There should be a minimum of one motion component, one light component and one sound component in the display.
- The show must be a minimum of one minute and a maximum of five minutes.
- The model creation and the programming must be completed by members of the team.
- Upload code and supporting documentation to a public GitHub repository and provide the link to OEF by Feb. 19. Supporting documentation should include but is not limited to:
    - A design document explaining the logical operation and physical construction of your display
    - Parts list including source and cost of materials used

Judging and Scoring

1. Prior to the competition, each display will be inspected by the judges to determine compliance with the contest requirements and specifications.
2. Any project that does not meet the above requirements will be ineligible for prizes.
3. Each team is responsible for the security of its entry. No time will be spent looking for or waiting for teams that are not present when it is their turn. Teams not present will go to the end of the queue if time permits.
4. Decisions of the judges are FINAL.
5. The competition area will be off limits to everyone except the competitors and officials.
6. Each team is responsible for providing batteries, supplies and tools as required.
7. This display will be judged on the following criteria and rubric:
    - Creativity
    - Quality of finished product
    - Code Quality

Creativity	Weight	Score (1-10)
General	10%	
Complexity of Show	15%	

Quality of Finished Product	Weight	Score (1-10)
Physical Display	15%	
Design Documentation	10%	

Code Quality	Weight	Score (1-10)
Well Documented	15%	
Readability	10%	
Bug-Free	10%	
SOLID Principles	20%	

Total Score	

Prizes and Distribution

Contest winners will be announced on the Engineering Fair web page at https://www.oef.org. Participants that win prizes will be notified through their teacher of record via email. First, second and third place winners will receive awards. In the event of a tie, prizes will be equally distributed between winning entries.