Project Proposal: **T-Rex Game**

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Project Outline

The goal of this project is to make a version of Google's T-Rex Game using an Arduino and a LCD Shield. The game will be a score based 2D endless runner where the T-Rex runs and attempts to avoid the obstacles that appear on the screen. As the T-Rex runs, the difficulty of the game will increase but the player will also gain more points. The user will control the T-Rex through a button that makes it jump.

While the initial goal will be to create a replica of the functionalities of Google's T-Rex Game, we hope to implement new creative ideas to move past the basics of Arduino and increase the difficulty of the project. Some of these ideas may include using a joystick with the button, a background soundtrack, the ability to save scores even after being powered off and more.

Hardware Component

- Arduino UNO R3
- LCD12864 LCD Shield Arduino Compatible

Other Components for Additional Features (if time permits):

- Speaker, Resistors, Wires, Headers, Buttons

Software Design

- LCD User Interface

Functions:

- Generate Random Obstacles
- Detecting Button Click (Switch Bouncing may come up)
- Drawing to LCD
- Playing tones to a speaker (if time permits)

Prototype Plan

For our initial prototype, we aim to have figured out how to draw the T-Rex to the LCD screen and have it gain points as the game runs. We also hope to have implemented user interaction through controlling the T-Rex with a button. Essentially, we aim to have at the minimum an almost complete replica of Google's T-Rex Game with the exception of generating and detecting collision with random obstacles. Once the prototype is complete, we will continue to work on designing new features and improving our game.

Anticipated Challenges

This project will be mostly our first time being exposed to Arduino. We expect quite a few challenges and barriers throughout the process of making the game. One of the first challenges we will face is understanding Arduino syntax and built-in functions such as setup() and loop() functions, and learning exactly how to implement them in our program. This will be overcome by read through the documentation in order to become more acquainted with its intricate framework.

Another big challenge will be integrating the LCD with Arduino, and being able to draw complex objects onto the LCD. We're aiming for an app that is enjoyable, but also looks nice - we want the user to actually enjoy playing our game, rather than just having something that looks like a knockoff of a 1970s ATARI game.