Project proposal

Abstract:
The goal of this project is to create an object called an infinity mirror. The mirror will be made of LEDs surrounding two mirrors that face toward each other. One mirror is a one way mirror so that it can be seen from the outside, allowing the light reflect inside the space in between 2 mirrors. A further goal is to make the infinity mirror interactive by using sensors and motors. The project aims to begin simply but progressively add complexity as more interactive features are added to it.

Technical Merit and Broader impact:

The project is very challenging because it requires:

Fundamental understanding of electrical circuitry
Apply mathematical model to programing – find a function to a sensor's input graph

So far I have learned how to read a datasheet and to pick the right component. I learned how to protect my MCU using a MOSFET as a switch. In addition, I learned how to read the datasheet to figure out the pin-outs for the MCU. I learned how to write and compile a program to communicate to my MCU. This project has two phases; first a prototype will be built as a small version of the final project. It will allow for testing and debugging. The second phase will transform my project from a wall decoration into an automatic door. To accomplish this I'm going to learn how to use the analog input from the IR sensor to control the LEDs color and a motor to open/close the door.

The project stems from the existing infinity mirror product but adds more complexity and features. There are a lot of people who have done this project before. They have put pictures and tutorials online. Usually these products are home decoration; more complex models of the infinite mirror use some arc to create a hall way illusion or DJ light show.
An interactive infinity mirror is an innovative project with a high potential to attract more students to join the club. Because all creatures are attracted to light, therefore lots of people will be interested in an interactive light show. This platform allows for further development by inspired club members. Tourist can interact with our product without our engineers.

 Budget:
The project is feasible.

Here is the list of items that need to be purchase

	price/unit	min quality	Cost	part #	shipping cost	link
RGB LEDs		50	3.7		5	http://www.ebay.com/itm/50-pcs-Ultra-Bright-5mm-4-pin-RGB-Diffused-Common-Anode-LED-Red-Green-Blue-/130918069818?pt=US_Car_Lighting&hash=item1e7b53363a
MOS FET	0.5	30	15	2N7000G	5	
MCU	24	1	24	teensy++2.0	5	
IR sensor	6.95	4	27.8	GP2Y0D810 Z0F	5	http://www.robotshop.com/en/sharp-gp2y0d810z0f-10cm-range-sensor.html
glass	2.2	1	2.2		5	http://www.fireflystoresolutions.com/p-9684-clear-glass-panel-12x12.aspx
mirror	1	9.99	9.99		5	
FTDI	9	1	9	CP210	5	http://www.dfrobot.com/index.php?route=product/product&filter_name=usb%20to%20serial&sort=p.price&order=ASC&page=2&limit=100&product_id=104#.Uo05ocSkp-4
servos	10	2	20		5	
wires/headers unknow expense			5		5	
total			161.7			

Schedule

22-Dec	Learn to use PWM	Blink LEDs using multiple output	
23-Dec	Learn to use PWM	Blink LEDs using multiple output	
24-Dec	Learn to use PWM	Blink LEDs using multiple output	
25-Dec	Learn to use PWM	Blink LEDs using multiple output	
26-Dec	Learn to use PWM	Blink LEDs using multiple output	
27-Dec	Learn to use PWM	Blink LEDs using multiple output	
28-Dec	Learn to use PWM	Blink LEDs using multiple output	
29-Dec	Learn to use UART	Calibrate sensors	
30-Dec	Learn to use UART	Calibrate sensors	
31-Dec	Learn to use UART	Calibrate sensors	
1-Jan	Learn to use UART	Calibrate sensors	
2-Jan	Learn to use UART	Calibrate sensors	
3-Jan	Learn to use UART	Calibrate sensors	
4-Jan	Learn to use UART	Calibrate sensors	
5-Jan	Programming phase	Pin register	
6-Jan	Programming phase	Make sensors change color of LEDs	Order Parts
7-Jan	Programming phase	Make sensors change color of LEDs	
8-Jan	Programming phase	Make sensors change color of LEDs	
9-Jan	Programming phase	Make sensors change color of LEDs	
10-Jan	Programming phase	Make sensors change color of LEDs	
11-Jan	Programming phase	Make sensors change color of LEDs	
12-Jan	Programming phase	Make sensors change color of LEDs	
13-Jan	Programming phase	Learn to control the speed of motor	
14-Jan	Programming phase	Learn to control the speed of motor	
15-Jan	Programming phase	Learn to control the speed of motor	
16-Jan	Programming phase	Learn to control the speed of motor	

17-Jan	Programming phase	Learn to control the speed of motor	
18-Jan	Design and construct the model	Draw the schematic	
19-Jan	Design and construct the model	Draw the schematic	
20-Jan	Design and construct the model	Complete the circuit	
21-Jan	Design and construct the model	Complete the circuit	
22-Jan	Design and construct the model	Build the prototype	
23-Jan	Design and construct the model	Build the prototype	
24-Jan	Testing	Run the prototype	Record the result
25-Jan	Fix the problem		

MCU

VCC

GND

R

G