

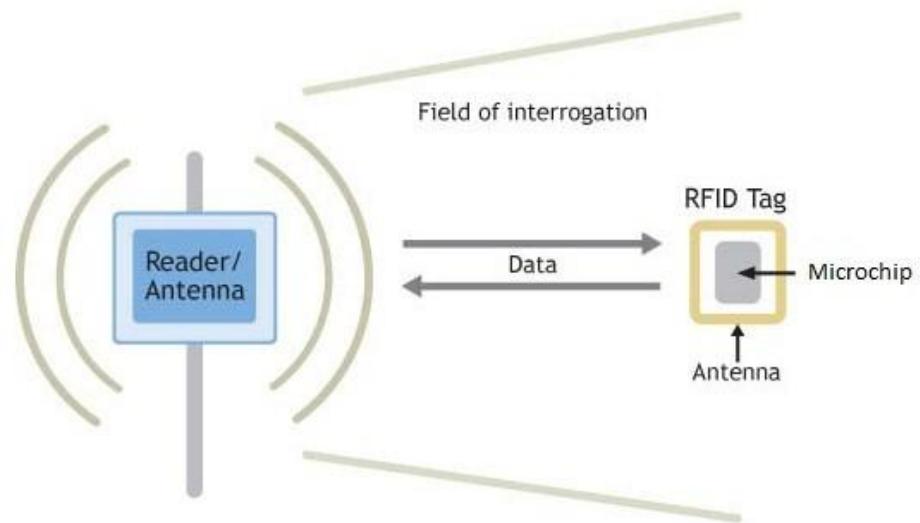
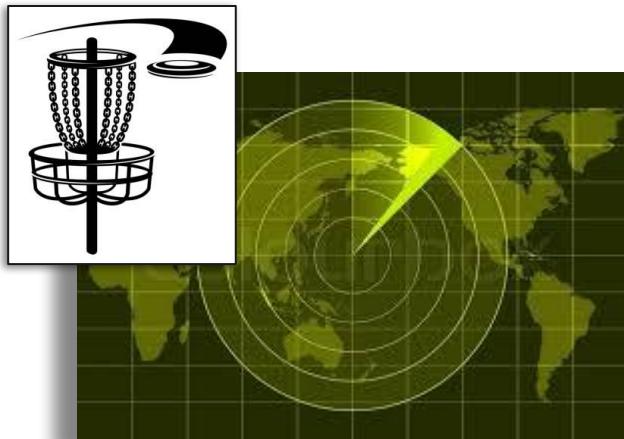


Disc Finders

Corey Moura, Timothy Beler

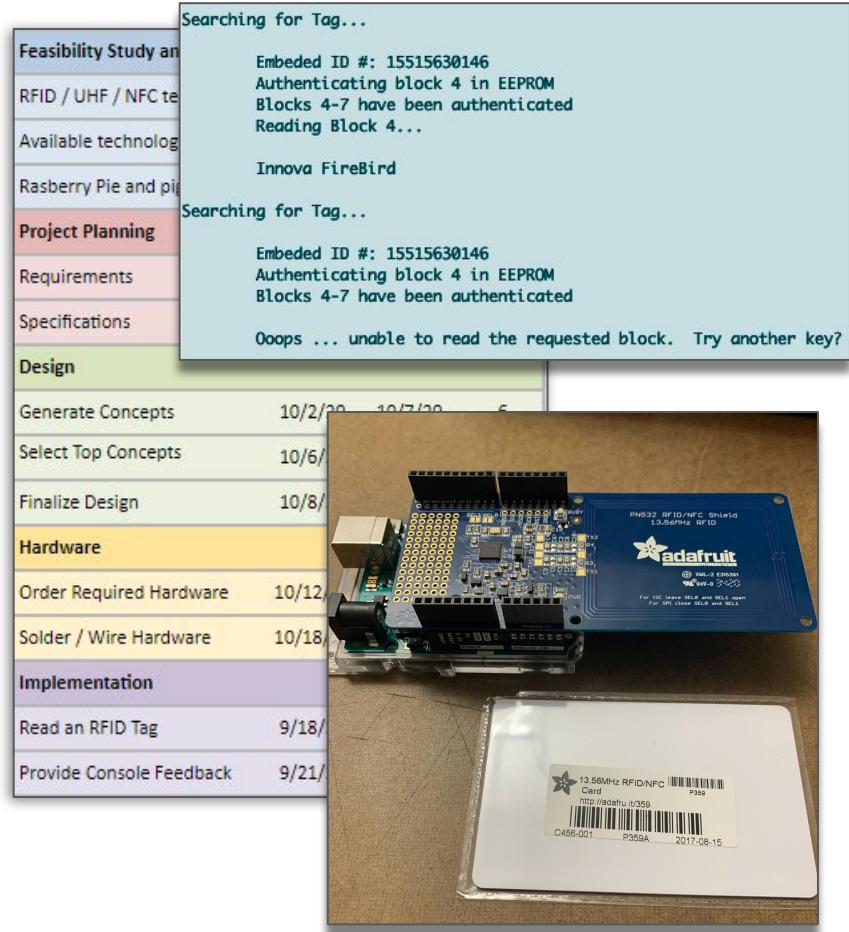
Project Refresher

Locate a lost disc golf disc using RFID technology.



Where We Left Off

- ❖ Feasibility Study and Research
 - Researched available technology
- ❖ Project Planning
 - Defined Specifications and timelines
- ❖ Design
 - Selected most promising design
- ❖ Hardware
 - Ordered and soldered hardware
- ❖ Implementation
 - Programmed basic tag reading capabilities



Exciting new Features!

We've gone wireless!.. Kinda

Interactive Display



Power Pack with On/Off Switch

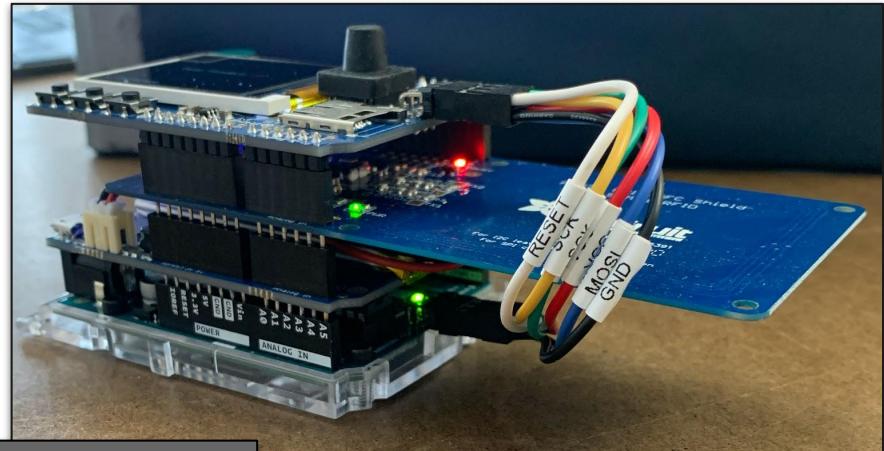
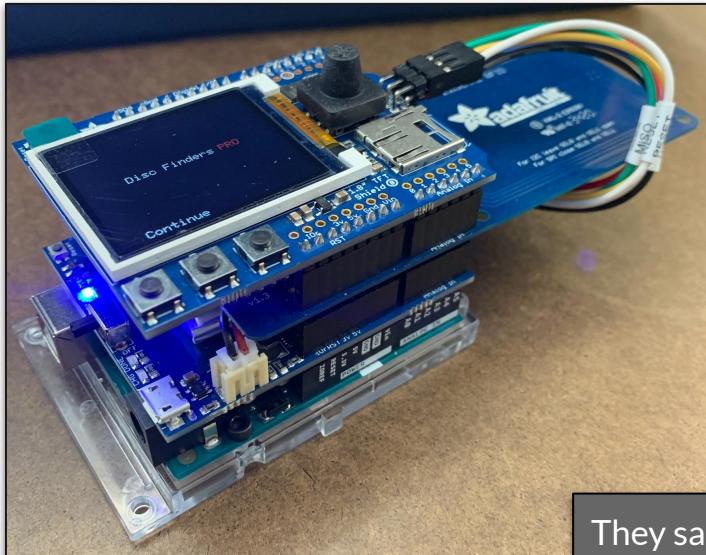


Wires



System as a Unit

Arduino + Power Pack + Transmitter + Interactive Display



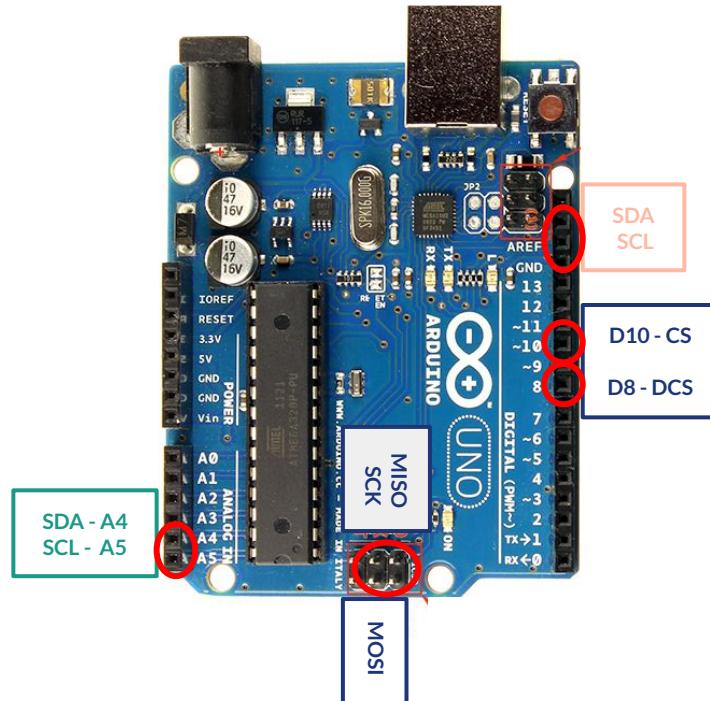
They said it couldn't be done!

Pinouts

Pin diagram for the RFID and Interactive display shields

RFID Shield

RFID Pins (I2C Communication)	Arduino Pins
SDA Serial Data Line	A4
SCL Serial Clock Line	A5



Interactive Display Shield

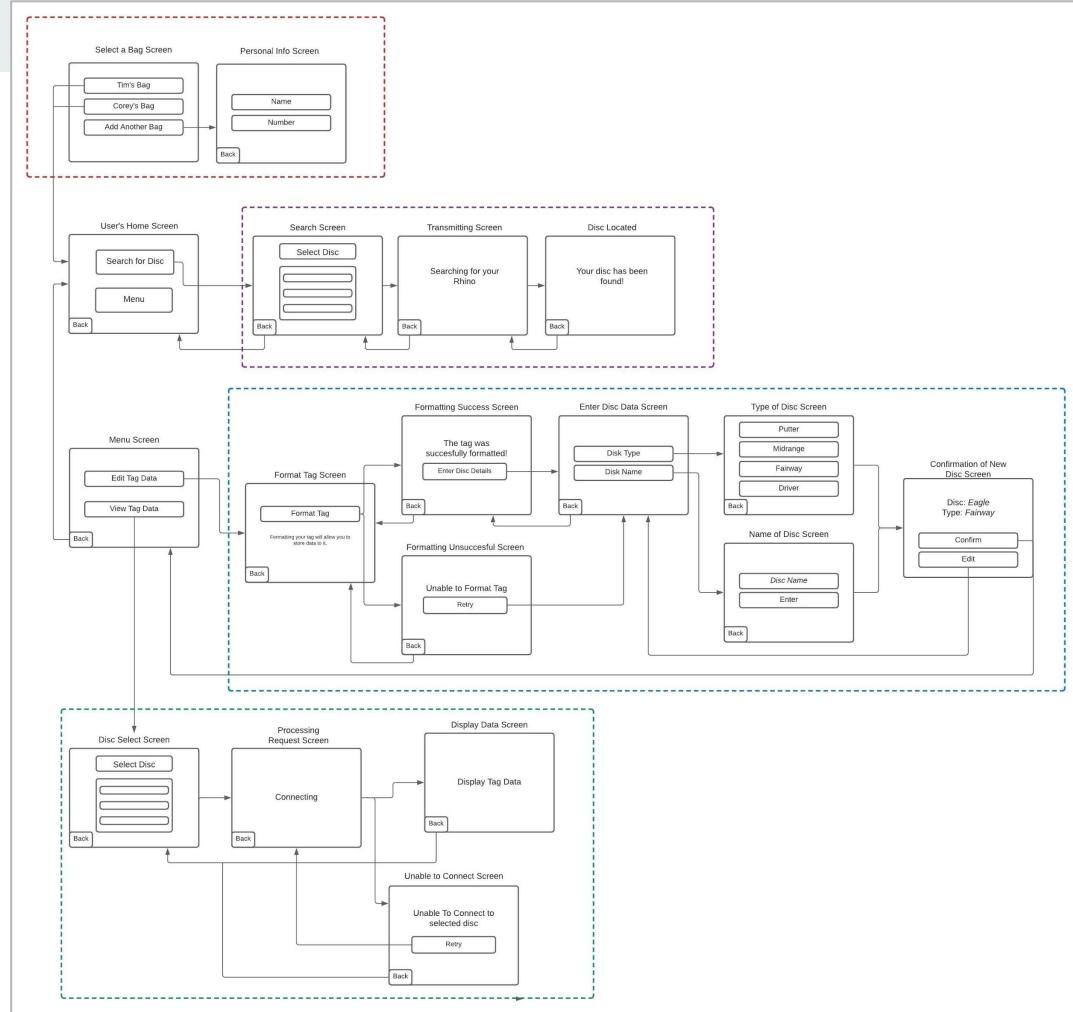
Buttons - Display (I2C Communication)	Arduino Pins
SDA Serial Data Line	SDA
SCL Serial Clock Line	SCL

LCD - Display (SPI Communication)	Arduino Pins
SCK Serial Clock	SCK
MOSI Master Out / Slave In	MOSI
MISO Master In / Slave Out	MISO
CS Chip Select	D10
DCS Data / Command Sel	D8

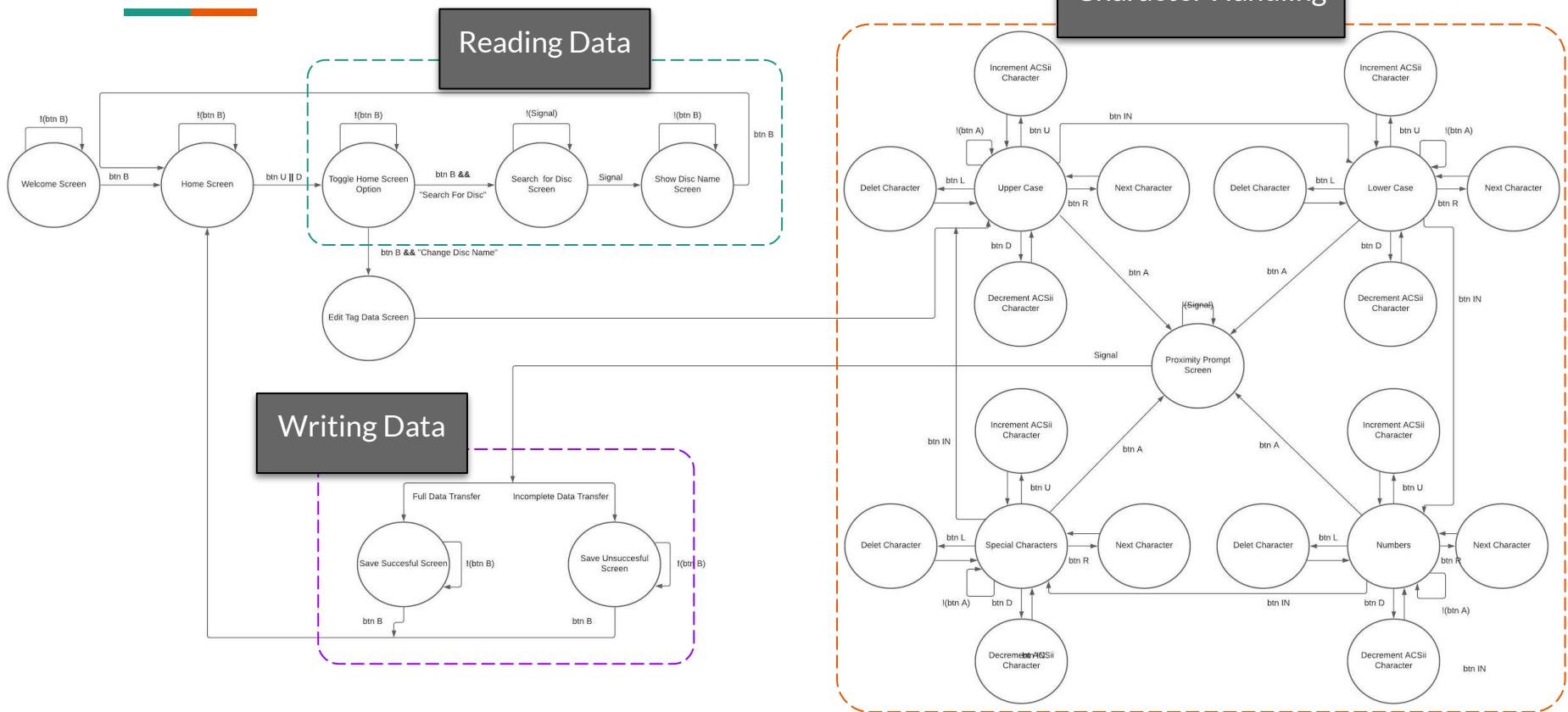
Screen Flow Chart



Do you remember our App
Screen flow chart?

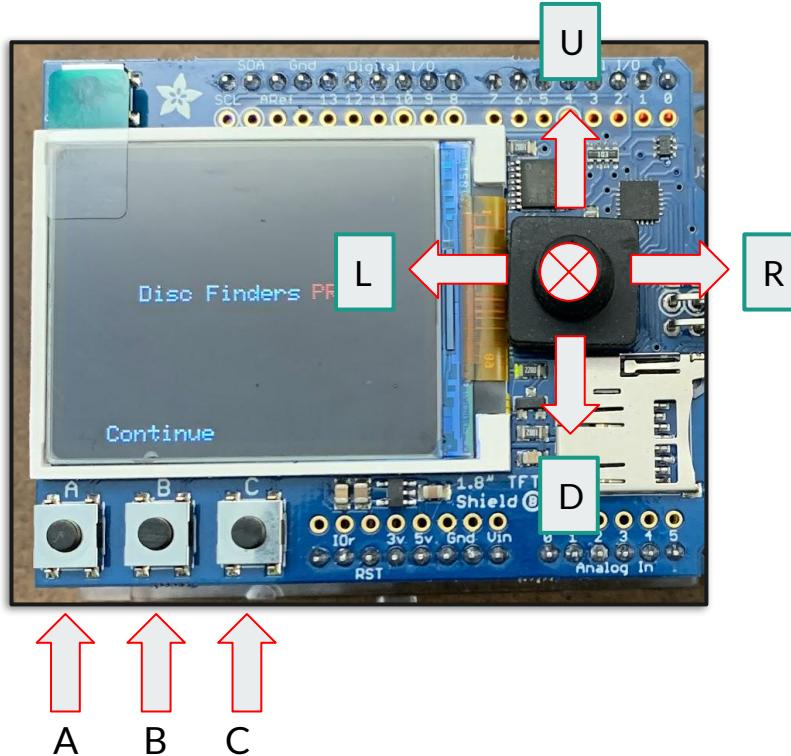


State Machine

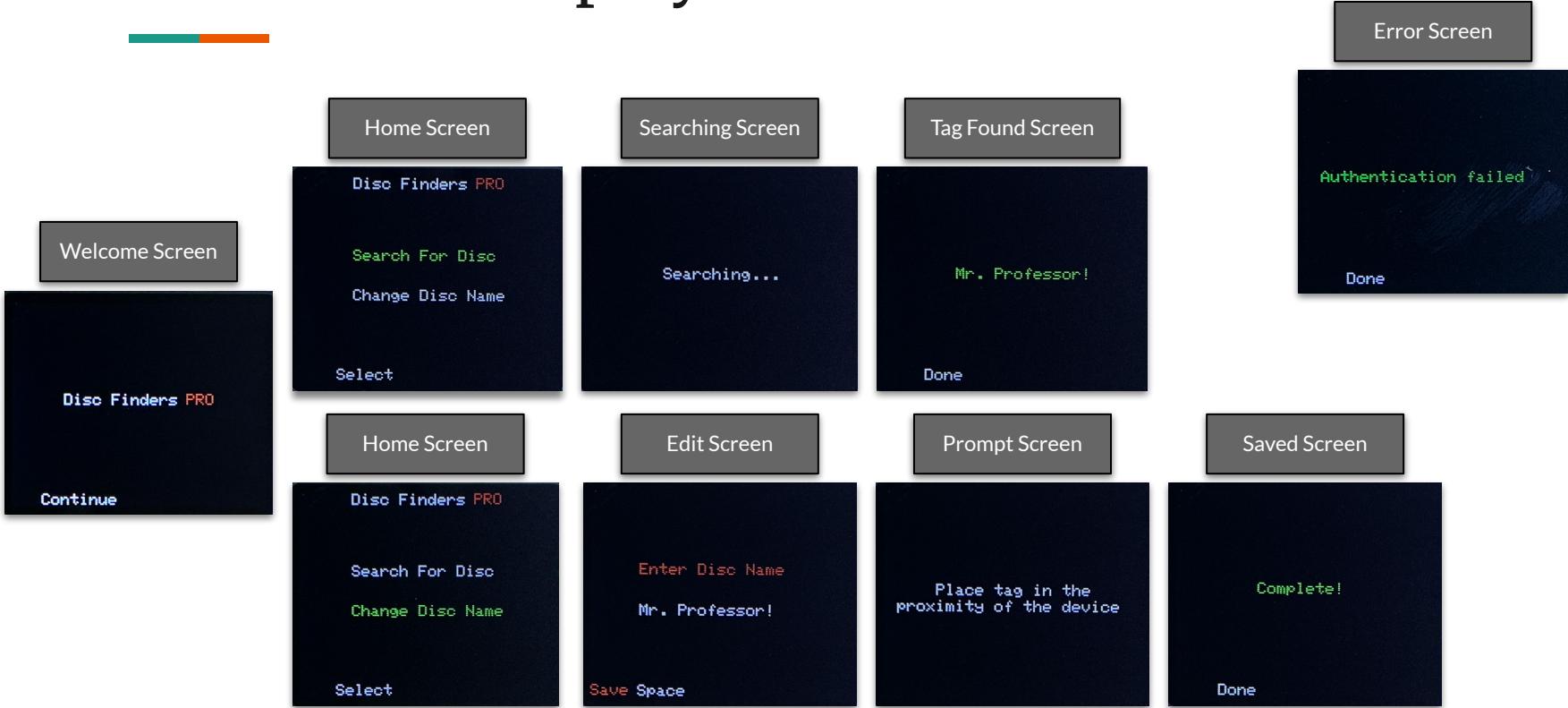


Button Layout

Button	Duty
Button A	Follow Prompt
Button B	Follow Prompt
Button C	Not Used
Toggle Left	
Toggle Right	Toggle Main Menu Choice
Toggle Up	Character Manipulation
Toggle Down	
Toggle In	



Interactive Display



Demo



Testing

How did we test our hardware and software?

- ❖ **Unit Testing**

- Check LCD character display function

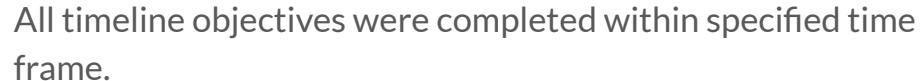
- ❖ **System Testing**

- Arduino Powers on via ON/OFF switch
 - RFID initialization successful
 - RFID shield initialization unsuccessful
 - LCD Shield initialization successful
 - LCD Shield initialization unsuccessful

- ❖ **Integration Testing**

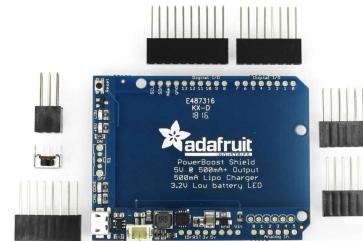
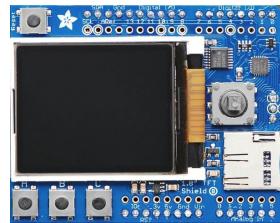
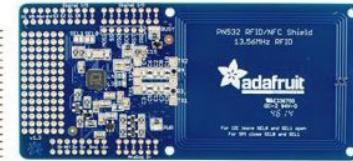
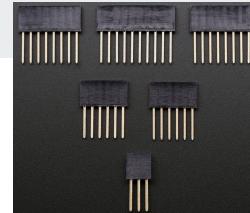
- The ‘B’ button on the LCD Shield initiates the RFID shield search process in appropriate state
 - The “Up” button increments the ASCII value character displayed on the LCD
 - The “Down” button decrements the ASCII value character displayed on the LCD
 - The “Left” button removes the current character on the LCD | Select “Change Disc Name”
 - The “Right” button increments the LCD cursor to the next character location

Timeline Evaluation



Try it Yourself!

Hardware	Quantity	Cost	Link
Arduino R3	1	\$22.95	https://www.sparkfun.com/products/11021
PN532 RFID Shield	1	\$39.95	https://www.adafruit.com/product/789
Interactive Display Shield	1	\$34.95	https://www.adafruit.com/product/802
Shield Header Pins	1 set	\$1.95	https://www.adafruit.com/product/85
90° Double Stack Header	2x20	\$1.95	https://www.sparkfun.com/products/12792
Female Jumper Wires	20 x 6"	\$1.95	https://www.sparkfun.com/products/12796
Powerboost 500 (Optional)	1	\$19.95	https://www.adafruit.com/product/2078
Lithium Battery (Optional)	1	\$12.50	https://www.adafruit.com/product/2011



Questions?