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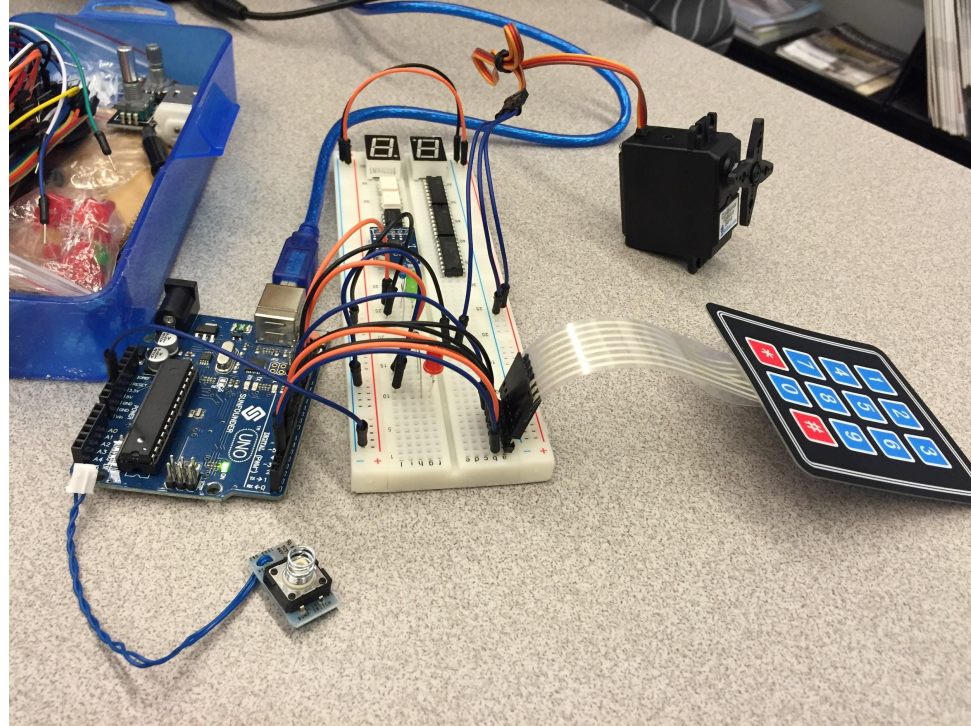
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# Lockbox Project

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# Demo



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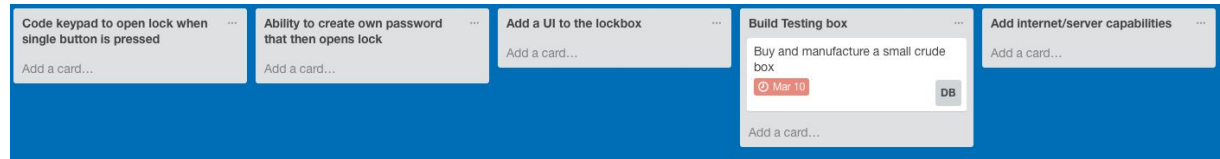
# Tools Used: An Overview

- Trello (Project Tracking)
  - Github (VCS)
  - Arduino & Tools (Deployment & Hardware)
  - Arduino IDE (Modified C#)
  - Custom-Written Code (Testing)
  - Solidworks (CAD)
  - Doxygen (Auto-Documentation)
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# Trello 1/5













- Used To keep track of what still needed to be done
- Not Utilized as much as it could be
- Found using mental notes of progress and updating each other at meetings more useful



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# Github 4/5

- Used to store and update all of our files
- Extremely useful for keeping archived files as well as new ones

 <a href="#">Doors1.SLDPRT</a>	Added updated doors part	21 hours ago
 <a href="#">Doors1final.STL</a>	Added .stl file of doors product	21 hours ago
 <a href="#">IMG1.jpg</a>	Added screenshots of LED blinking, Automated Tests	21 days ago
 <a href="#">IMG2.jpg</a>	Added screenshots of LED blinking, Automated Tests	21 days ago
 <a href="#">Project_Plan.png</a>	Added a Project_Plan screenshot from Trello	2 months ago
 <a href="#">README.md</a>	Updated README.me to describe our final project status.	14 hours ago
 <a href="#">Screenshot 2016-04-26 17.45.42.png</a>	Uploaded base of our CAD plastic box	21 hours ago
 <a href="#">TESTING.md</a>	Formatting and minor edits	21 days ago
 <a href="#">Useful_Links</a>	Create Useful_Links	2 months ago
 <a href="#">base_surface.SLDPRT</a>	CAD surface materials uploaded	21 hours ago
 <a href="#">base_surface.STL</a>	CAD surface materials uploaded	21 hours ago
 <a href="#">keypadwithchangepassword.ino</a>	Added more comments	21 hours ago

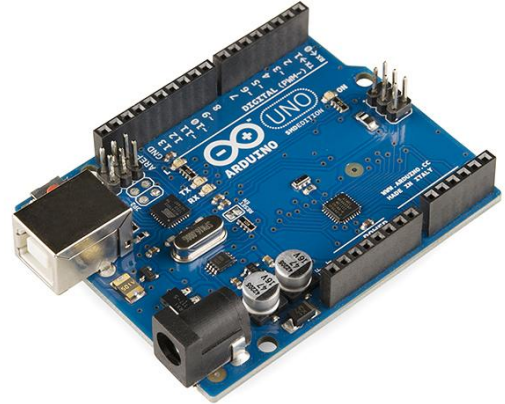
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# Arduino & Tools



5/5

- Project would be impossible without these
- Tools Include: LEDs, Small Speaker, and Keypad
- All extremely useful in the lockboxes design



# Arduino IDE 5/5



- Used to actually write code for the arduino
- Uses a modified version of C#

```
keypad_servo
#include <Servo.h>
#include <Key.h>
#include <Keypad.h>
const byte ROWS = 4; //four rows
const byte COLS = 3; //three columns
char keys[ROWS][COLS] = {
  {'1','2','3'},
  {'4','5','6'},
  {'7','8','9'},
  {'*','0','#'}
};
byte rowPins[ROWS] = {8, 7, 6, 5}; //connect to the row pinouts of the keypad
byte colPins[COLS] = {4, 3, 2}; //connect to the column pinouts of the keypad

Keypad keypad = Keypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS );

#define speaker 9
#define ledpin 12
#define ledpin2 13
String combo="1234";
String inputcombo="aaaa";
//int limiter=0;
char key;
Servo myservo;
bool correct;
bool passwordchange=false;

void greenlightblick()
{
}

void redlightblick()
{
  digitalWrite(ledpin2,HIGH);
  delay(100);
  digitalWrite(ledpin2,LOW);
}

void passwordfailure()
{
  digitalWrite(ledpin2,HIGH);
  delay(100);
  digitalWrite(ledpin2,LOW);
}
```

9 Arduino/Genuino Uno on /dev/cu.usbmodem1411

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# Custom Written Code



2/5

- Used to test individual functions on the code
- Impossible to use to test all aspects of the project, many aspects had to be manually tested

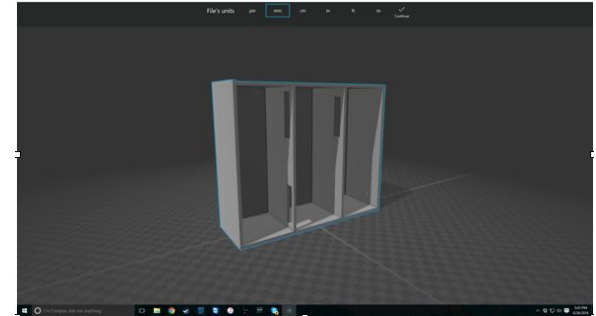
```
void test()
{
    inputcombo = "1234";
    passwordcheck(inputcombo);
    if(correct==1){
        passwordsuccess();
        if(passwordchange){
            newpassword();
        }
    }
    else{
        passwordfailure();
    }
    delay(1000);
    inputcombo = "2345";
    passwordcheck(inputcombo);
    if(correct==1){
        passwordsuccess();
        if(passwordchange){
            newpassword();
        }
    }
    else{
        passwordfailure();
    }
    delay(1000);
    combo = "0123";
    delay(1000);
    inputcombo = "0123";
    passwordcheck(inputcombo);
    if(correct==1){
        passwordsuccess();
        if(passwordchange){
```



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# Solidworks 3/5

- Note: Screenshot is of 3d Maker, not Solidworks due to lack of software on personal computers
- Used to CAD and create a full 3D model of the box to be 3D Printed



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# Doxygen 1/5



- Used to auto-document our code
  - Created an HTML based manual
  - Difficult to use
  - Implementation not viewed as useful for the team for this project
  - Implementation also not viewed as useful for the end-user due to the use of code documentation, rather than user-level documentation
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# Challenges

- Physical Box Manufacturing
  - Testing
  - Implementing user-changeable password
  - Hardware Limitations
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