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|  | Foundation Activity 10 Servo Lock Box |

Lock Box

We want to make a box that is locked and unlocked by a turning servo motor. We will use a button to switch the motor position between locked or unlocked.

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| **Box Locked** | **Box Unlocked** |
|  | [[1]](#footnote-1) |
| When the **button is not pressed**, the motor should turn so the lid of the box cannot be lifted. | When the **button is pressed**, the motor should turn to allow the lid to be lifted. |

Digital Input

The Arduino can **read voltage values** on its pins. Digital input pins read values either as HIGH (~5V) or LOW (~0V). To give a clear digital value to the Arduino pin we use a **pull-down resistor** with the button as shown here:

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| C:\Users\Harryp\MEGA\Surface Pro 2\Nepal\Himalayan Makers Guild\Activities\Activity 14 - Servo Lock Box\images\buttonunpressed.png  NOT PRESSED | C:\Users\Harryp\MEGA\Surface Pro 2\Nepal\Himalayan Makers Guild\Activities\Activity 14 - Servo Lock Box\images\buttonpressed.png  PRESSED |
| The resistor pulls the PIN voltage down to GND. No current flows. | PIN is connected directly to 5V. Current flows from 5V to ground. |

Programming with If Else Statements

We want the Arduino to understand whether or not the button is pressed.  
**If** the **button is pressed**, unlock the box; **otherwise**, lock the box.   
For this we use an if/else statement which has three parts:

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| 1. **if**: the Condition/Question. 2. **do:** What to do if the condition is true. 3. **else:** What to do otherwise.   So for the lock box,   1. **if:** the button pressed 2. **do:** unlock the box 3. **else:** lock the box |  |

In an if/else statement condition (1), a HIGH (5V) value means **true** (go to 2) and reading a LOW (0V) value means **false** (go to 3).

Functions in BlocklyDuino

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| **If/Else Statement:**  If/Else is under “**Logic”** in the left side-bar menu. Click the gear and drag **“else”** into the **“if”** block. |  | | 🡪 |  | |
| **DigitalRead Function:**  DigitalRead is under “**Input/Output**” in the left side-bar menu. Set the PIN# that the Arduino should read. This is how the Arduino can check to see if the button is pressed. | |  | | |

Servo Motor Pinout

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| **Wire**  Signal  5V  GND | **Colour**  Yellow or Orange  Red  Black or Brown |  |

1. Servo motor and Arduino breadboard images from Fritzing [↑](#footnote-ref-1)