

| **Aim :** | To make a smartphone connected door lock using Arduino.

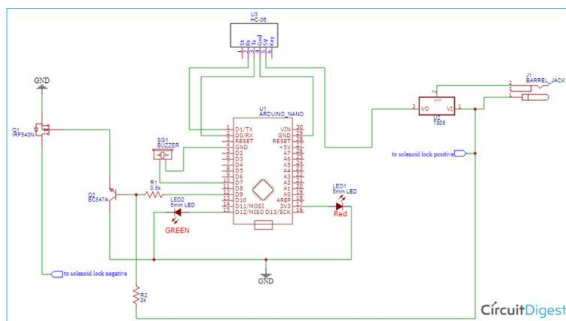
| **Apparatus :** |

| Raspberry Pi 3 model B
| High Torque Servo, Tower Pro MG995R
| Red, 3 mm LED light
| Mini push button switch
| Jumper wire (5 units)
| Outdoor mounting tape
| 1/4" MDF Board

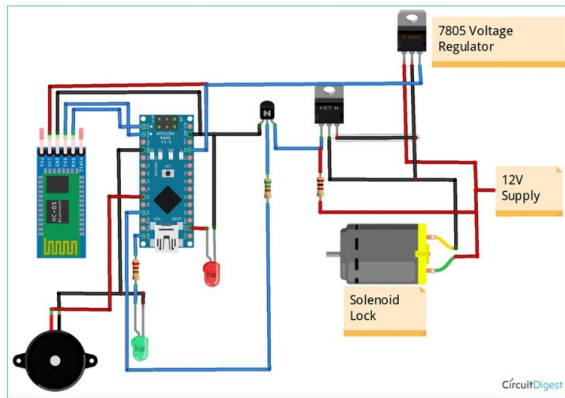
| **Procedure :** | **Step 1:** Collect all the needy equipments, material.

| **Step 2:** Use the above link https://youtu.be/C7UiRTsBz_w and follow the instructions.

| **Step 3:** The complete circuit diagram that shows how to interface and control a solenoid lock with an Arduino through a MOSFET is shown below.



As shown in the circuit diagram, the connections are rather, simple you need to connect the HC-05 Bluetooth module to the nano by powering the device with a 5V power supply and connect the TX pin to RX pin of your microcontroller and RX pin to the TX pin of the microcontroller. You need to add a red LED to display the power status of the Arduino nano and a green LED to show if the door is unlocked. You also need to connect a buzzer. The connection diagram is also shown below for easy understanding.



To control the solenoid lock, you need to use a control circuit that comprises an NPN Transistor and N channel MOSFET. We will control the NPN transistor by connecting the D9 pin of the Nano to the base pin of the transistor via a 550 Ohm resistor to control the current flowing into the Transistor. When the D9 pin is pulled high, the transistor is turned on and the gate pin of the MOSFET is pulled to the ground, turning the MOSFET OFF that turn off the solenoid lock and when the D9 pin is LOW, the NPN transistor is off which means that the GATE of the MOSFET is pulled to 12V via a 2kOhm pull up resistor to turn on the MOSFET and power the solenoid lock. In this way, you can control the Solenoid lock using your 5V Arduino Nano. You can not directly control the IRF540N MOSFET with 5V pins from the Nano as it is not a logic-level MOSFET so it won't fully turn on or off with 5V from the nano, hence we will use the BC547 NPN transistor to control the MOSFET.

| Step 4: Once you are done with all this instructions and guidelines y our | System is ready too be used.

| Conclusion: | Here we have successfully created our project.