Institute of Technology of Cambodia

Department of Electrical and Energy Engineering

Course Title: Analog Electronics

npn BJT as cabinet Drawer Electric Door Lock

Group 4:

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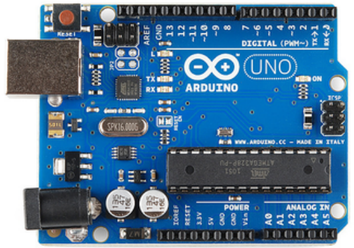
3.	**SOK THYRITH**	**Edit Slides**
4.	**SOK VATHANAK**	**Build Circuit**
5.	**SOM CHANTOLA**	**Leader**
6.	**SOM SOMBATHROTANAK**	**Researcher**

Components

Power Suppy

Door lock

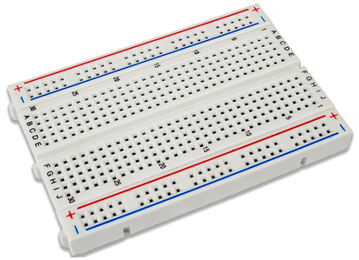


Arduino

resistor

jumper wires

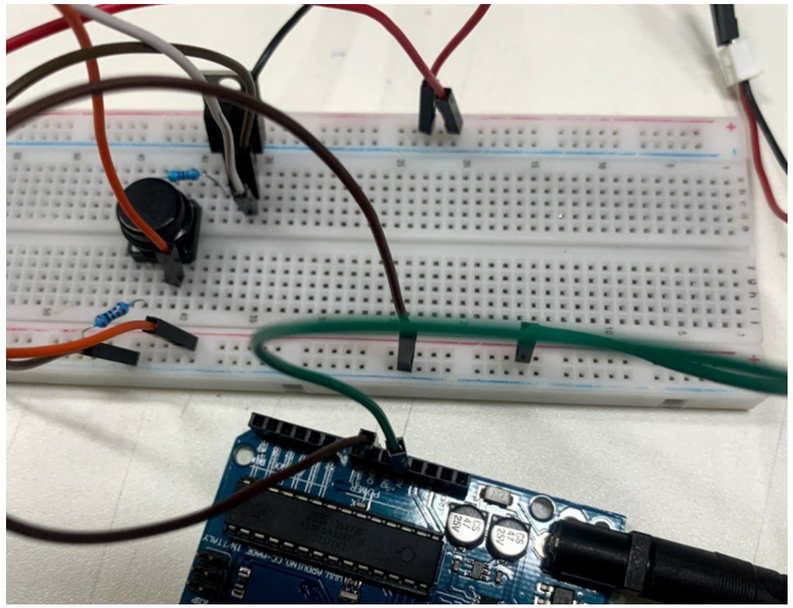
Transistor

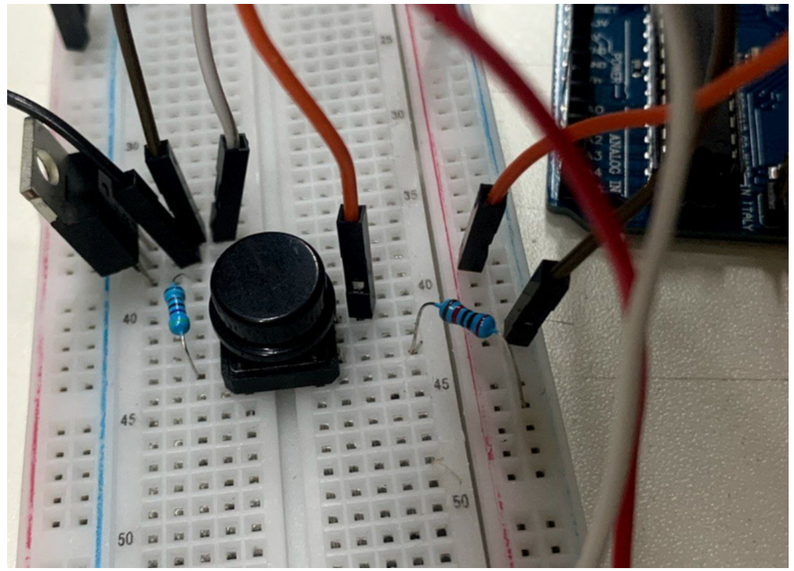


breadboard

push button

The process





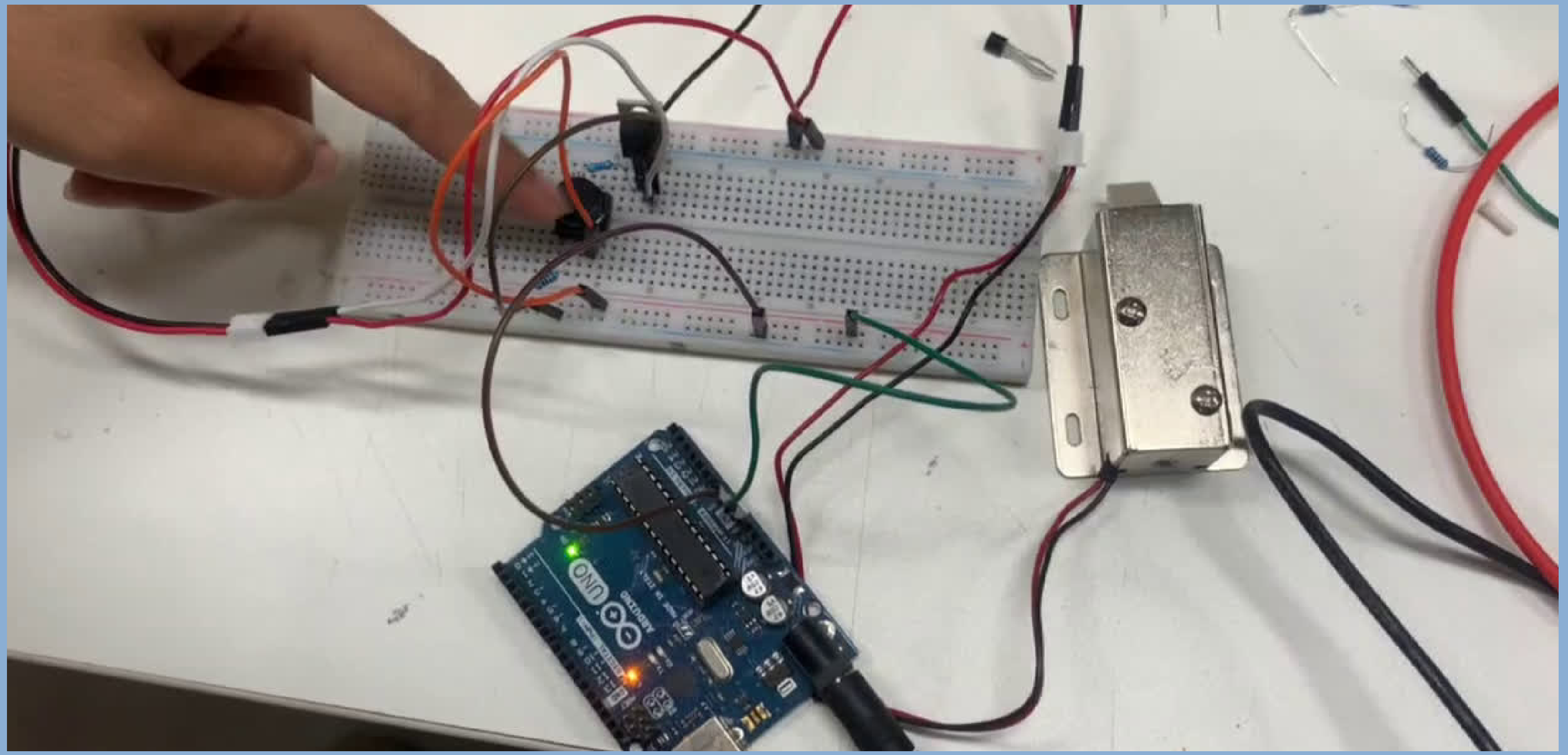
1. Connect the lock to the positive terminal of the power supply and the other to the collector of the transistor(1RF630N).

2. Connect the emitter of the transistor to the ground of the power supply and Arduino. Then Connect a 4.7kΩ resistor from the base of the transistor to the terminal of button.

3.Connect the other terminal of the push button switch to the ground of the terminal 5V of Arduino. Connect a 20kΩ resistor from button to ground of Arduino.

3.Finally we supply 12V that connected terminal of lock and collector and 5v from Arduino to button on breadboard. All of connect using jumper wires.

Result of process



Calculation

Assume transistor is biased in Forward-active mode:
on circuit we assume RB=4.7kohm , V(BE)on=0.7v, β = 150
and we have VB=5v, VC=12V

By KVL, Then base current is:

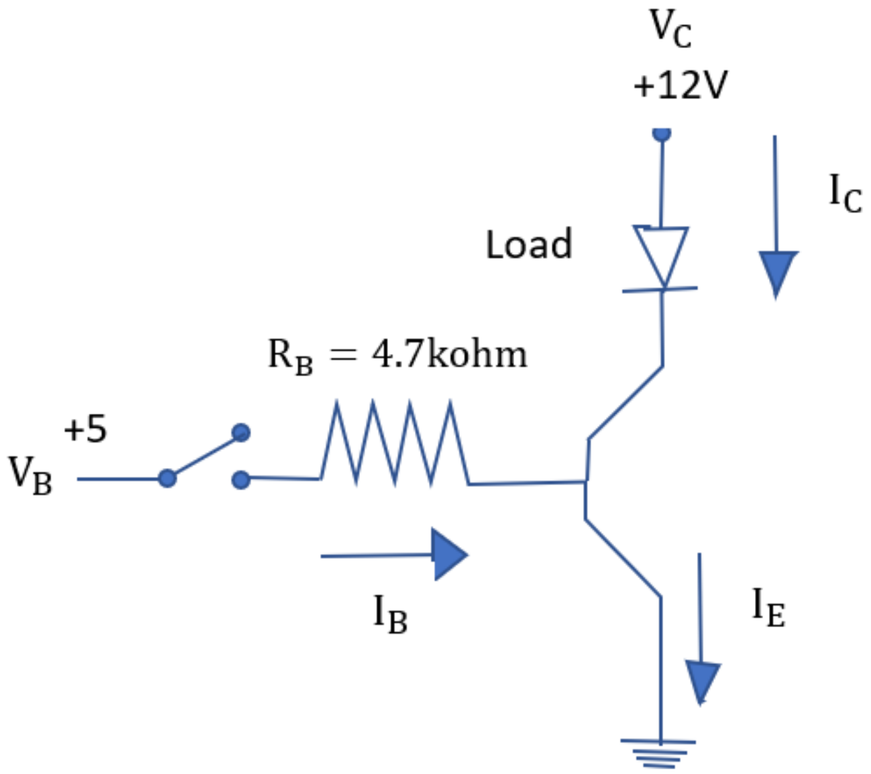
IB=(VB-V(BE)on)/RB=0.91mA

So, the collector current is:

IC=βIB=136.5mA

The emitter current is:

IE=(1+β)IB=137.41



Thank you!