

# Etude 3: Perceptron-P

CART 360 AUTUMN 2023 (6.0 PTS)

DUE: November 18th by 1:30pm (Saturday/ Samedi)

SUBMIT: To the ETUDE-THREE Assignment Resource on the CART360 Moodle page

WHAT: 1. REFER TO “WHAT TO SUBMIT”

DESCRIPTION:



In Etude-Three, the medium for expression is Light, you are tasked with building a fully functional Perceptron-P – a POV (Persistence of Vision) circuit. In both PART-ONE, -TWO, -THREE of the Etude, you will need to recall concepts presented over the semester i.e. Identification of Components, Polarity and Flow ‘n Control of an Electric Signal (Voltage/Current/Resistance) and evaluation of code.

For this Etude-Three to be successful, you need to plan the Perceptron-P in-action documentation (PART-Three), look at the sample photos provided.

The code for Perceptron-P will be included with this description as an Arduino Project, you are required to create four easily identifiable custom characters ALPHANUMERIC ie. CART – you will need to look at the provided Arduino project code, understand the flow and implement your four custom characters.

**Nota Bene:** Etude-Three is intended to be completed within 4 - 6 hours.

Materials:

5 x NON RGB LEDs (3 x White, 2 x Blue) (Choose the LED Colour)

1 x Momentary Switch

5 x Resistors (300 Ohm/ 220 Ohm), 1 x Resistors (10 K OHM)

1 x Arduino

1 x 9V Battery (Power your Arduino)

1 x 9V Battery Clip

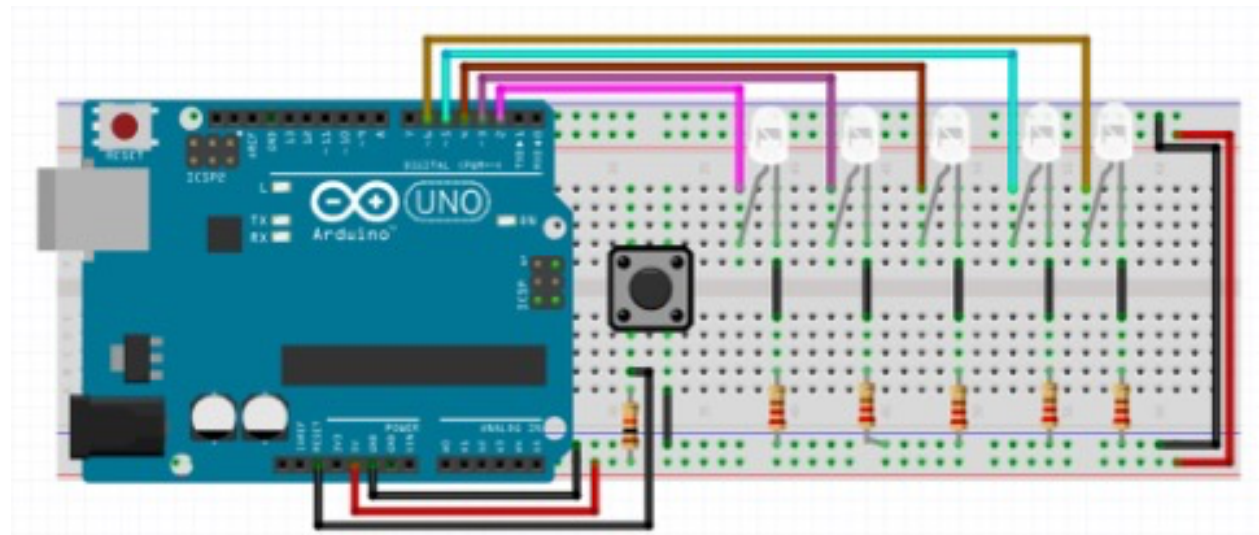
1 x Elastic Band to fasten Arduino to breadboard.

### **PRELUDE: Arduino IDE Setup**

Open the provided Arduino sketch and prepare your Arduino IDE, such that it can be used to upload the Perceptron-P code to your Arduino.

### **PART ONE: Perceptron-P (Etude-Four Circuit to be Built) (1.0 Pts)**

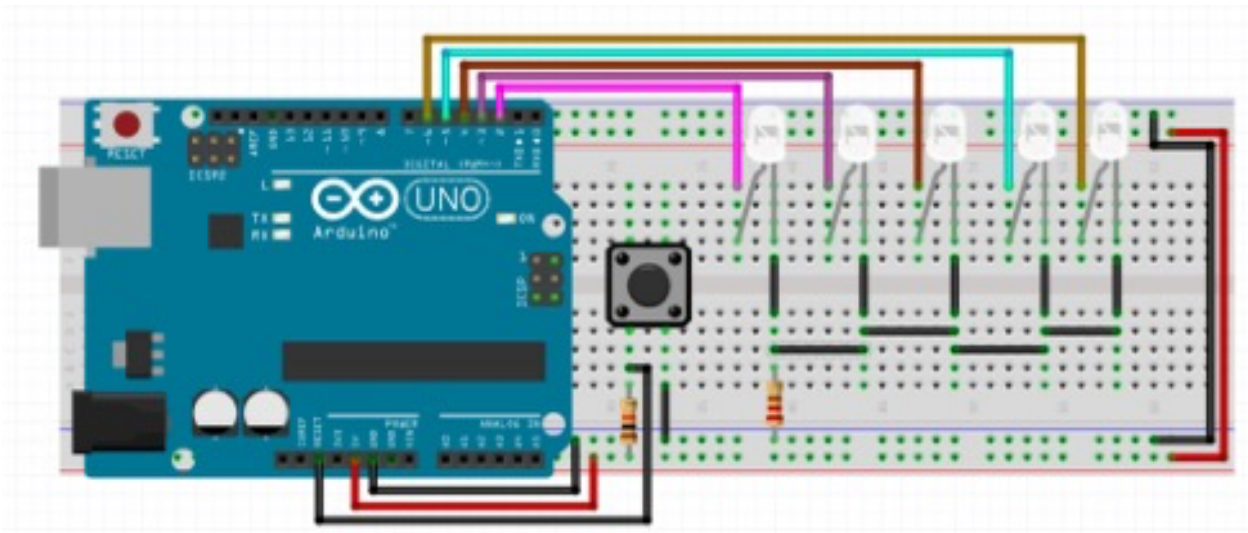
Refer to Fritizing and photo media (provided)



Power the circuit using a 9V Battery and Battery Clip **(BUILT CIRCUIT)**

## PART TWO: Perceptron-P (Etude-Four Alternate Circuit) (1.0 Pts)

Compare and contrast the Electronic Schematics of the **Built Circuit** to the **Alternate Circuit**. Determine the feature(s) that distinguish these two circuits – what makes them different? Why? Which of the circuits presented would be more reliable circuit – Why? What is occurring with the V/ I / R in the area(s) that you have discerned as important? What could one do to enhance Perceptron-P.



Compare BUILT vs ALTERNATE Circuits (**ALTERNATE CIRCUIT**)

## PART THREE: Perceptron-P (2.0 Pts)

Explain, succinctly with appropriate terminology and code references (**line numbers from Arduino Project Code**) **where** and **how** the perceivable characters are encoded in the Persistence-of-Vision code – how is the desired effect achieved when Perceptron-P is manoeuvred through the air (look at the sample images).

## PART FOUR: Create a Unique Perceptron-P Message (2.0 Pts)

Perceptron-P works within a 5 X 5 matrix - <https://www.hackster.io/B45i/make-a-pov-display-with-attiny13-for-1-e94b25>

Using the provided Perceptron-P code:

- A) Read through the provided Arduino project code, **you will be required to create four custom characters – ALPHANUMERIC - (four easily identifiable and understood custom characters)** that will only be perceivable/observed in your Perceptron-P documentation (look at the sample images).

- B) Find the appropriate section or area in the code where you will insert your unique message – consider what is possible in Perceptron-P.

**Save, Compile and Upload your code to your Arduino. Capture your message (document your work).**

## WHAT TO SUBMIT

Submit on the CART360 Moodle page, a single archive (zip) with PDF document and photograph your Perceptron-P.

- a) PART ONE – clearly document your approach and strategy i.e. notes / observations / photos of circuit building progress.
- b) Answer to PART TWO.
- c) Answer to PART THREE
- d) Document / Capture the Perceptron-P in-action, this will require careful setup to capture the light trails evoking your message. **To capture the action, you will need a long exposure slow shutter photo app i.e. <https://nocamerabag.com/blog/review-slow-shutter-cam-app>.** Submit four (4) good quality images which showcase the Perceptron-P POV in action (Photos in landscape orientation).