

Perceptrons Graphing

Eckel, TJHSST AI2, Spring 2022

Background & Explanation

This is a delightful way to better visualize how perceptrons work!

Install the **matplotlib** package if you haven't already. Find a tutorial somewhere that shows you what you need to accomplish the following. Then, write code that will loop over each 2-bit Boolean function's truth table and:

- Completely train a perceptron as described on the Perceptrons 2 assignment.
- Output an inequality graph on a **domain and range of $(-2,2)$** to show the results of your training! Your graph should have:
 - A *small* dot every 0.1 units in a grid. **Color each small dot according to whether or not its coordinates return 1 or 0 when passed through your perceptron.** (Note that this means you'll pass non-integer values into your perceptron; as shown on the previous assignments, this should be fine – it's just a linear inequality after all!)
 - A *large* dot at each of the four actual input vectors from the truth table, just like you see in the Desmos graphs on pages 2 and 3. **The large dots should not be colored according to the perceptron output; they should be colored according to the truth table.**
- In other words, what you'll see on each graph is big green dot(s) surrounded by little green dots, and big red dot(s) surrounded by little red dots, *except* for functions #6 and #9, where we should see at least one big dot surrounded by the wrong color!

In all, your code should output 16 separate graphs.

Specification

Submit your **code** to the link on the course website.

This assignment is **complete** if:

- The "Name" field on the Dropbox submission form contains your **class period**, then your **last name**, then your **first name**, in that order.
- Your code matches the specification above. (No command line arguments; it just runs.)