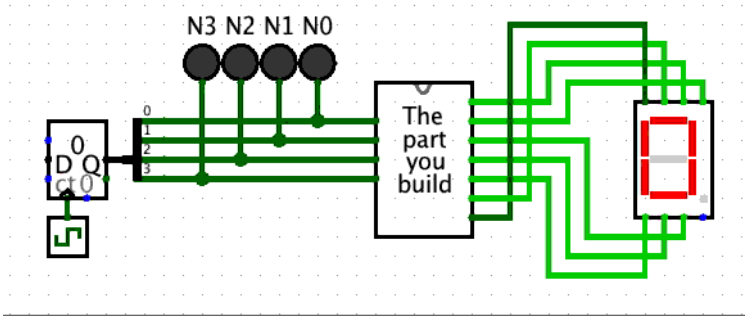
Homework 2: Seven-Segment Decoder

Due Date: Before class on January 26th.

What it will look like

You will create an encoder chip for a seven-segment display:

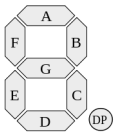
- It has a four-bit input representing a binary number.
- It has seven output bits, one for each segment of a seven-segment display, which turn on the correct segments for each input. You can see an animation of this circuit on my web site.



What you will do

The written part

1. You will giving me eight pages of written work. Please use eight pages of ruled paper. Write your name and "CISS 420 Homework 2" at the top of each page.
2. On the first page of the document, create a truth table for the decoder. You should have seven outputs labeled a through g:



3. On the next seven pages of the document, create K-maps for each of the seven segments. Write the simplified Boolean expression for each segment after the K-map.

The circuit part

1. Start with the *HW2.circ* Logisim file in the *Homework 2* folder. Download it, and immediately add your name to the "main" circuit drawing.
2. Add a sub-circuit. Implement your decoder logic in this circuit.
3. When you add an instance of your sub-circuit to the main circuit, it should look like the image above.

Turning it in

1. Go to your turn-in directory in gdrive.
2. Create a folder labeled "Homework 2" inside your turn-in directory.

3. Copy your Logisim file into the assignment folder.
4. Bring your written work to class.