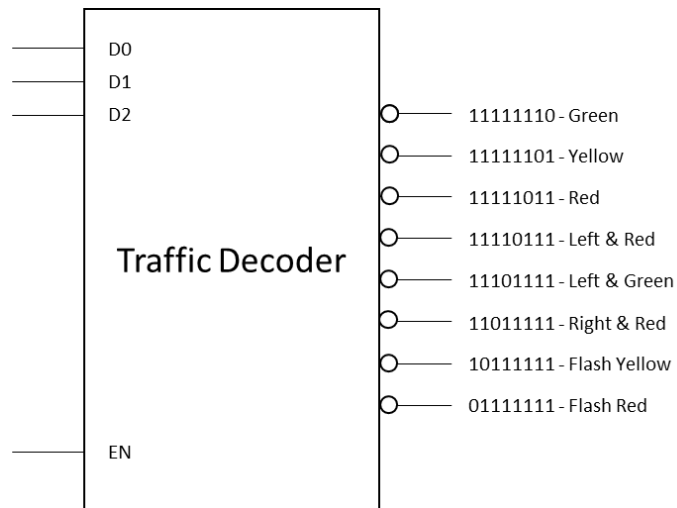


ECE3270 Digital System Design  
Homework: OpenCL Libraries

Homework Overview: The purpose of this homework is to ensure each student can successfully use OpenCL and familiarize themselves with the concept of Libraries for OpenCL.

Part I

You are to design a 3-bit to 8-bit decoder with an enable pin. This particular decoder will be used to assign states for traffic lights. All pins on the output are high except for the pin corresponding to the input. For example, “000” maps to “1111110” and “011” maps to “1111011”.



Design this as a behavioral circuit in VHDL. Specifically, write the description bitwise using internal signals as necessary. Use ModelSim to verify functionality.

Part II

Create a new entity and instantiate a component of your traffic decoder within it. Include all signals necessary for OpenCL Libraries and set them as required. Follow the OpenCL compilation and Usage Instructions guide to run and test your circuit. OpenCL will send the data to your decoder and save all the results. It will then give you human readable output for each test input. View the README.txt in the tarball for sample output and verify this matches your program execution.

You will be required to write a full report using the LaTeX template.