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COMPUTER ENGINEERING
COM3525 PROJECT-1 REPORT
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Traffic Lights Simulation

The problem

In this project, our goal was to design a traffic light simulation. As in our project, in systems with more than one traffic light, one traffic light must be green while the other traffic light must be red. In addition, more than one color should not be lit at the same time in a traffic light. It arose that we needed to design a model for such synchronization adjustments and determining the duration of the lights and the cycle could continue indefinitely unless the system was stopped.

What we learned in brief.

A few preliminary information was required to be able to do this project. The first of these was to learn the VHDL programming language and the MODELSIM program, which allows us to test what we produce in this language. In order to increase our knowledge about the program and the VHDL programming language, we used the source given to us from the project file and the sources we found on the internet.

We learned how to define a variable in the VHDL programming language. We also found that it would be more effective to use the "generic" data type to avoid code duplication and to create a constant value variable. We defined the signals to turn on and off the red, yellow, and green lights in our project and in the traffic light. In addition, we have defined the necessary input and output ports for receiving and evaluating these signals.

We have created a process in the project that should continue to work as long as the system is not stopped. In addition, we have defined a counter in which we determine the opening and closing times of the lights in this general process. This counter determined how long each state would last in the model we designed.

Ideas to improve

In order to improve the simulation, the amount of traffic lights that need to work in sync can be increased by choosing more complex road designs. For example, eight traffic lights can be designed in a crossroads that must be illuminated.

In addition, by incorporating newer software into the existing system, systems can be designed that allow traffic to flow the fastest according to the number of vehicles on the road. These systems can self-adjust the flashing times and colors of traffic lights.