GEORGIA INSTITUTE OF TECHNOLOGY
SCHOOL of ELECTRICAL and COMPUTER ENGINEERING

ECE 8813A Spring 2017
Problem Set #3

Assigned: 3-Feb-17
Due Date: 9-Feb-17

Your homework will be due at the *start* of class.

PROBLEM 3.1:

Given: Farmer John was very happy with the designs at the Preliminary Design Review (PDR), however he has a couple of concerns. His farm is next to a highway and he is worried the traffic will cause false readings of day and night. Therefore he is requesting the use of a GPS unit to control the time of the watering. To offset the increased cost of the GPS unit he is REMOVING the requirement to shut off the system during freezing weather.

For the next stage of this project design a block diagram for the sprinkler timer and control the timing with the GPS time. I have provided some sample Verilog code that will get the location from the GPS data stream but not the time. Modify this code to obtain the time information. We are using a NMEA 0183 compliant GPS unit. An example of the serial output from one of these GPS units is also attached. Please note that this data is in ASCII format, so use the $fgetc function in your testbed to read the file. The table at the link below shows the conversion between ASCII and binary.

(a) `http://www.asciitable.com/index/asciifull.gif` : ASCII Table.

Turn in the completed design for a single zone. This design should include the hand written block design, Verilog code for the design, and testbed for the design. Use the GPS to control the start time and stop time. The rain sensor should be used to shut off the water if it is raining.