Project Design Documents
Preliminary Design Review

• Demonstrate that the preliminary design meets the requirements
• Show that the correct design options have been selected, and interfaces identified

• You should show
  – An understanding of the requirements
  – Schematic diagram(s), with description
  – Software flowchart(s) or pseudocode, with description
  – Timing diagram(s), with description
  – Sketch of physical hardware setup (if appropriate)

• It is ok if you change the design later, but you should at least have a good starting design.
Schematic Diagram(s)

- For large systems, it is better to break up things up into subsystems and draw individual schematics for each subsystem

Example (from Todd Nelson and Ryan Straily)
LED Row Schematic

Example (from Todd Nelson and Ryan Straily)
Software Design – flowchart example

Flowchart example
(from Todd Nelson and Ryan Straily)
Software Design – pseudocode example

**System setup pseudo code**
- Initialize the PWM system and set to drive PT0..PT4, PM4
- Initialize PT0..PT4, and PT7 as outputs
- Initialize PM2..PM5 as outputs
- Initialize Analog to Digital converter system for AN00..AN05
- Initialize the RTI system for regular interval timeouts
- Initialize t: a place to hold a running clock
- Initialize t\_check: the amount of time between motion detecting states
- Initialize t\_wait: the amount of time to wait before rotating the IR sensor again
- Enable RTI Interrupts

**Patrol (Line Following) pseudo code**

```plaintext
Loop forever:
    Read the left and right line sensors
    If the right sensor is over the line:
        If the left sensor not over the line:
            Turn right (right motor stop)
        Else drive straight
    Else drive straight

    If the left sensor is over the line:
        If the right sensor is not over the line:
            Turn left (left motor stop)
        Else drive straight

    If t > t\_check
    Check for motion (state = Detect)
End
```

(from Lucas Cook and Evan Manning)
Timing Diagram

Figure 1: Timing diagram for shift register data, plane selection and decoder enable.

Example from Todd Nelson and Ryan Straily
Sometimes the physical design is a key part of your project

Smart Irrigation System (courtesy of Abdulaziz Alsenaide and Basil AbuHadi)