ECEN 5018 Spring 2014 **Vince Coghlan**

Homework #3

Problem 1. [20 Points] What is a process context switch? When does it occur? Describe the steps involved in implementing a process context switch

Problem 2. [10 Points] What are the advantages and disadvantages of threads vs processes?

Problem 3. [40 Points] Unisex bathroom problem: CU wants to show off how politically correct it is by applying the U.S. Supreme Court's "Separate but equal is inherently unequal" doctrine to gender as well as race, ending its long-standing practice of gender-segregated bathrooms on campus. However, as a concession to tradition, it decrees that when a woman is in the bathroom, other women may enter, but no men, and vice versa. A child may enter the bathroom only if there is at least one adult present in the bathroom. Finally, at most N (N > 1) individuals may use the bathroom at any time.

You task is to write three functions: man_use_bathroom( ), woman_use_bathroom( ), and child_use_bathroom( ). Provide a monitor-based solution that manages access to the bathroom. Your solution should be fair, starvation free and deadlock free.