CEN6070 – Software Verification, Fall 2008

Homework #6 (12 points), **Due** Dec. 2 (Tuesday)

The well-known Dijkstra's five dining philosophers' problem is as follows: there are five philosophers sitting at a round table, and there is a chopstick between every two adjacent philosophers. Each philosopher is either thinking or eating. In order for a philosopher to eat, he needs to have both his left side and right side chopsticks.

Requirements:

(1) Write an SMV program to capture the Kripke structure of the above problem;
(2) Run the SMV system to verify the following properties (defined in CTL):
  (a) Mutual exclusion: no two adjacent philosophers can eat at the same time (note: chopsticks are viewed as resources in this problem);
  (b) Deadlock freedom: there is always some philosopher who will be able to eat;
  (c) Starvation freedom: every philosopher will be able to eat infinitely many times often.