

## Homework Assignment #5

### Note

This assignment is due 2:20PM Thursday, May 31, 2012. Please write or type your answers on A4 (or similar size) paper. Late submission will be penalized by 20% for each working day overdue. You may discuss the problems with others, but copying answers is strictly forbidden.

### Problems

- (40 points) Define a Büchi automaton (by drawing its transition diagram) for each of the following temporal properties.
  - $p$  holds initially (at 0-th position) and at every third position.
  - Whenever  $p$  holds,  $q$  must hold eventually at a strictly later position.
- (60 points) Apply the simple on-the-fly translation algorithm to construct a generalized Büchi automaton from the LTL formula  $(p \vee q) \mathcal{U} (p \wedge q)$ . Please try to illustrate how the algorithm works by showing a few partially constructed automata during the translation.