

## CS 290C – Spring 2013 – Homework Assignment 1

Due Thursday, April 18th

**Do not discuss the problems with anyone other than the instructor.**

1. Specify the following navigation properties in temporal logic LTL. Assume that the navigation model represents web pages as states and links among the pages as transitions. Also assume that the set of atomic propositions corresponds to the set of web pages.

(a) Eventually exit page is visited.

(b) Always eventually home-page is visited.

(c) The first page is the login-page and the next page is either the login-error-page or the home-page.

(d) Whenever login-page is visited, the next page is either the login-error-page or the login-success-page.

(e) It is not possible to reach my-page.

(f) Only the public-page or the login-page can be visited until the login-success page is visited.

(g) If the timeout-page is reached at any point, then the next page is the login-page.

(h) There is no way to reach the modify-order-page once the purchase-completed-page is reached.

(i) The account-information page cannot be viewed right after the session-terminated page.

(j) Shipment-page cannot be reached before the purchase-page.

2. Draw a statechart-based navigation model for the following site: <http://www.ce.ucsb.edu/> by only considering the links through the top menu that starts with “Home” and ends with “Graduate Studies”. Only model the links provided in that top menu and the two levels of top-sub-menus that appear under the top-menu.

3. Draw a regular (flat/sequential) state-machine that corresponds to the statechart shown in Figure 1 of the paper titled “Implementing Statecharts in Promela/Spin.”

4. Write two Promela specifications corresponding to the navigation models given in Figure 13 and Figure 18 of the paper titled “Modeling Web Navigation by Statechart”.

Write three LTL properties about each navigation model (at least one of them should fail), explain the properties in English and check them using the Spin model checker.

Turn in your Promela specifications with the properties and the output.

You can run the spin model checker using the following path:

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/cs/faculty/bultan/public_html/courses/290-S13/bin/spin
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