Assignment 3

(Due date for assignment is Monday December 9th,4:00 p.m. ., Late date Thursday December 12th, 4:00 p.m.)

This assignment may be completed with a partner. Sorry, no groups of 3 or more.

Consider a building with 50 floors and 3 elevators to service the building. We can assume that the building has 2 stair wells which may be used as well.

Consider the following requirements:

1. An elevator must stop exactly on a floor. The door must not open otherwise.
2. Should electrical failure occur, there must be a method for passengers to communicate to the outside world. That passengers do not suffocate in an elevator.
3. If a cable breaks, it will not fall.
4. That any failure, means failing in a safe state.
5. Fire alarms prevent unsafe usage of the elevators.
6. The system should be tamper proof.
7. There should be redundancy in critical systems.
8. Furthermore, any system which is built must be Dependable, Reliable, Safe, Secure and Resilient (see book ch.10 to 14).

Design a software specification which will adhere to the above principles. As part of your development you must show the hazards which will affect the safety of the system. The system must be tamper proof. That is, it must resist tampering from external sources, for example, sensors being purposely tripped, or prevented from being tripped. The system must be fail safe.

There may be a human element, which will override aspects of the system. This should be kept to a minimum, but may be necessary to give proper function and features. The floor buttons would be one such interaction element.

When completed, you should have a design which includes a s/w specification, and a system architecture which is justified by an analysis of the system. Be sure requirement 8 is fulfilled. Feel free to draw diagrams showing sensor and button placement.

Consider as part of your submission a hazard tree. Draw diagrams of the architecture which shows the layout of the sensors and safety system. Note: this is a real time system, so state transition diagrams would be beneficial to describe the system.

Part of the marks will be allocated toward completeness and thoroughness of the analysis. Those submissions which show exemplary effort will benefit.

Submission

- Your submission should be contained in a large (8.5 inch x 11 inch) envelope.

- **Cover Sheet** completely filled out, available from: " http://www.cosc.brocku.ca/forms/teamcover" **Note**: your assignment will not be marked unless one is submitted with the assignment on the assignment due date. This should be stapled to the outside of the envelope.

End