

# C-S 743 Software Verification and Validation

## Assignment 5

### Formal Verification

All the answers must be typed. No hand-written assignments will be accepted.

Using predicate logic, formalize and solve the following problem:

- A file is said to be edited when it is opened and its contents are changed.
- A file is not closed unless it was opened.
- If a file is closed and saved, then its contents must have been changed.
- If a file is closed but not saved, then its contents are not changed.
- This file's contents are changed and it is closed.

Prove that this file must have been edited and saved.

You must write every step of the derivation process. Make sure that you write the conclusion in English at the end