COMP2411 Assignment 2 Questions

Solutions are to be submitted at the lecture on Thu Mar 23. Solutions must be *handwritten*, printouts are not acceptable. You are reminded of the rules concerning collaboration and plagiarism on the Course outline. This assignment is worth 2% of your final mark. All parts have equal value.

1. Using truth tables, determine whether or not the following entailment holds. If it does not, indicate which line of the truth table constitutes a counter-example.

\[(P \lor Q) \rightarrow R, \ (P \rightarrow R) \rightarrow Q \models (\neg Q) \rightarrow S\]

2. Translate to logic:

If the button is pressed then either the slow lift or the fast lift will service the request. If the fast lift services the request, then the passenger will arrive at the destination within one minute. If the slow lift services the request, then if no requests have been made on other floors, the passenger will arrive at the destination within one minute. Thus, if the button is pressed and no requests have been made on other floors, the passenger will arrive at the destination within one minute.

Use the following propositional constants:

- P = The button is pressed.
- S = The slow lift will service the request.
- F = The fast lift will service the request.
- N = No requests have been made on other floors.
- A = The passenger will arrive at the destination within one minute.

Using natural deduction, prove that this argument is valid.