

COM 6854: Verification and Testing

Exercise Sheet 3

Exercise 1: The door to the Matrix bouldering wall of the University of Sheffield can be entered by typing a code. You are asked to develop two simplistic labelled transition systems for this door. There are only three keys A , B and C and the door opens when the code ABA has been typed.

- (a) Assume that users can make arbitrarily many errors. What does the LTS look like? Important system properties are:
 - (i) Whenever the door opens, the three last digits were A , B and A .
 - (ii) Every trace that ends with the actions A , B and A leads to a state where the door is open.

Argue (informally) that these properties hold on your LTS.

- (b) Assume now that users are rejected after 3 errors. In your LTS, you could now use labels that model the digits and also the conditions and incrementation of the counter.