

CSI 5109

Assignment 5

1. Page 75 of the second paper by Guttag, Horowitz and Musser presents an implementation of a queue using a circular list, and starts to prove that the implementation satisfies the definition of the Queue type by proving two of the axioms (those on lines 8 and 18). By reference to the definition of Circular List on page 64 and to the definition of Queue on page 65, continue this process by proving the correctness of the implementation of Queue axioms on lines 11, 14, 15, 17 (relating to DELETEQ, FRONTQ, and APPENDQ).

2. Consider the following rewriting system:

syntax:

true, false \rightarrow boolean
not (boolean) \rightarrow boolean
boolean and boolean \rightarrow boolean

rules:

not(true) \Rightarrow false
not(not(a)) \Rightarrow a
b and b \Rightarrow b
b and not (b) \Rightarrow b

Find all critical pairs and complete the rewriting system. Provide appropriate explanations.