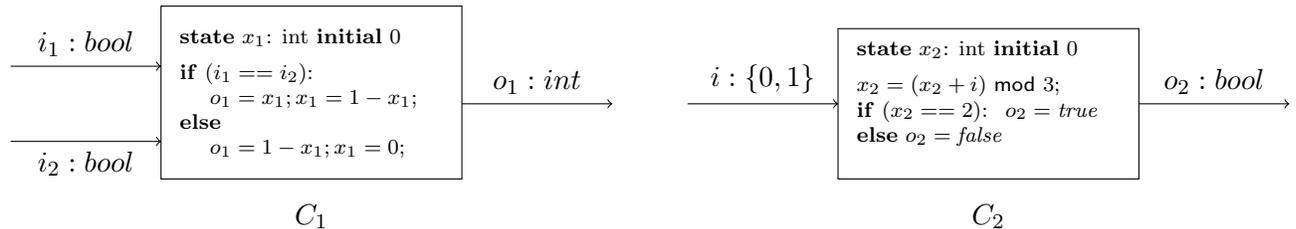


Verification and Control of CPS: Assignment 2
Due Date: Thursday, September 18, 2014 (4:30 PM)

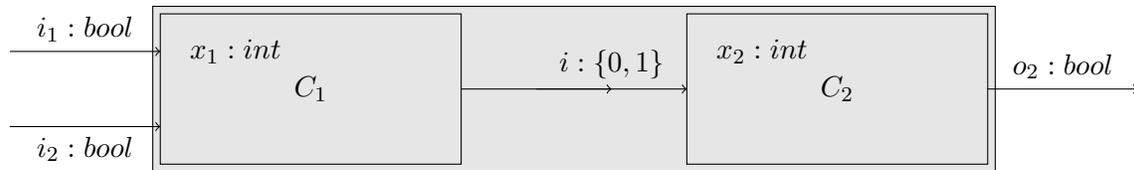
P1. Consider the synchronous components C_1, C_2 with their imperative description. For component C_2 , note that input i is an integer but can only take the values $\{0, 1\}$.



(A) Carefully draw state diagrams for the two components above. Draw just the reachable states of each component. You may check your answer for this part carefully with your classmates or the instructor before proceeding.

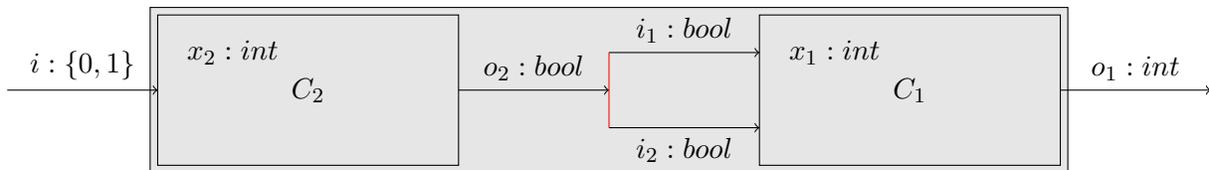
Draw state diagrams for the compositions shown below.

(B) Output of C_1 is fed as input of C_2 .

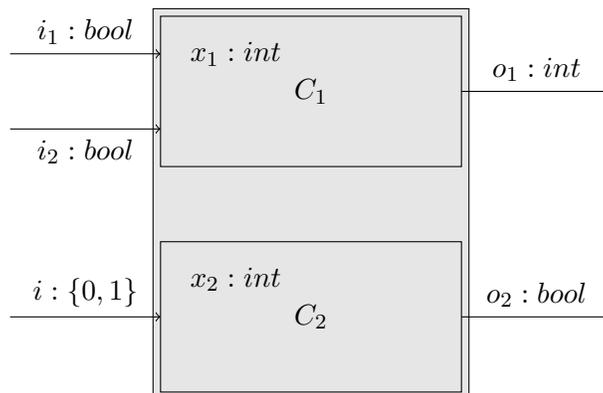


Suppose the input i to the component C_2 were instead set to the range $\{-2, -1, 0\}$ argue whether the composition shown above is possible. Write a brief justification 2-3 sentences at most.

(C) Output of C_2 is fed to both inputs of C_1 .



(D) Parallel composition.



P2 After considering the compositions in each part of problem **P1** (B)-(D), write down at least two safety properties for each of the parts in P1 (B)-(D) of the composed system that are true, and at least two safety properties that are violated by the composed system.