CS 720, Fall 2016
Homework 11

Due Date: December 7

1. For each of the following statements, determine of the statement is true
   or false. If the statement is false, give a specific counterexample. (True
   statements do not require proof.)

   (a)

   $$s \models_{fair} \forall \bigcirc a \text{ iff } s \models \forall \bigcirc (a_{fair} \to a).$$

   (b)

   $$s \models_{fair} \forall(bUa) \text{ iff } s \models \forall(bU(a_{fair} \to a)).$$

2. Baier and Katoen, Exercise 6.22, Part b.

3. Let TS be the transition system in Baier and Katoen, Exercise 6.23 and
   let Φ be the formula
   $$\exists \bigcirc (a_4 \wedge \exists(a_2 U a_5))$$
   Use the CTF model checking algorithm to determine if $TS \models \Phi$ (without
   fairness). Show your work in a step-by-step manner.
   (The answer is obvious, but in order to get credit, you have to use the
   algorithm and show the steps.)