Sean Poston
CS345 Homework 4

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5.

$p \wedge C_1 \{S_1\} q$

$p \wedge \neg C_1 \wedge C_2 \{S_2\} q$

$p \wedge \neg C_1 \wedge \neg C_2 \wedge \ldots C_{n-1} \{S_n\} q$

6. I think I'm misunderstanding the tautology assertion because if the initial assertion were always true, then y would be -2. Otherwise it would take the second stage of the above:

$p \wedge \neg C_1 \wedge C_2 \{y := 2\} y = 2$

7. $i \leq n \{power := power * x \wedge i := i+1\} i > n$

12.

$r := a$, $q := 0$ $\}$ $S_1$

while $r \geq d$, $r := r - d$, $q := q + 1$ $\}$ $S_2$

$(a \wedge d) > 0 \{S_1\} p \wedge (q = 0)$

$r \geq d \{r := r - d \wedge q := q + 1\} (a = dq + r) \wedge (0 \leq r < d)$

This is true. If a is 2 and d is 1, then it will loop twice, leaving $r = 0, d = 1, q = 2, a = 2$

$a = dq + r \Rightarrow 2 = 1(2) + 0 \Rightarrow 2 = 2$ ✓

$0 \leq r < d \Rightarrow 0 \leq 0 < 1$ ✓

22 1. a.) Yes d.) No

b.) Yes e.) Yes

c.) No f.) No

22 30 a.) $O(x) = \Omega(x)$ d.) $O(\log x) = \Omega(\log x)$

b.) $O(x^2) = \Omega(x^2)$ e.) $O(\log x) = \Omega(\log x)$

c.) $O(x) = \Omega(x)$

24 2 a.) while $i < n$
while $j < n_2$
if K
true

b.) It would be $O(n^2)$

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