

Quiz 9: Operational Semantics for Commands

● Graded

Student

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Total Points

4 / 5 pts

Question 1

Sequential Composition

Resolved 4 / 5 pts

✓ + 2 pts Showed the final result for $(c_1 c_2) c_3$

✓ + 2 pts Showed the final result for the $c_1(c_2 c_3)$

+ 1 pt If one doesn't terminate, the other doesn't as well.

+ 0 pts Incorrect/Not Attempted

🔄 Regrade Request

Submitted on: May 13

Sir in the last line of the solution, I wrote the termination condition.

write it formally.

Reviewed on: May 14

Q1 Sequential Composition

5 Points

Show that *Sequential Composition* of commands is *associative*; that is, given any table γ , executing either $c_1; (c_2; c_3)$ or $(c_1; c_2); c_3$ will result (if they terminate) in the *same* table. (And if one doesn't terminate, neither does the other).

[Hint: You may make assumptions such as:

$\gamma \rightarrow [c_1] \rightarrow \gamma_1$, and $\gamma_1 \rightarrow [c_2] \rightarrow \gamma_2$, and $\gamma_2 \rightarrow [c_3] \rightarrow \gamma_3$.]

lets compare

$(\gamma \rightarrow (c_1) \gamma_1) (c_2; c_3)$

and

$(\gamma \rightarrow (c_1; c_2) \gamma_2) (c_3)$, we show both result in same table γ_3 ,

Assuming both sequences of commands terminate

From the assumptions given in the problem we get

(assumption 1 and 2) $(\gamma \rightarrow (c_1; c_2) \gamma_2)$ and now combining it with third assumption of $(\gamma_2 \rightarrow (c_3) \gamma_3)$ we get

$(\gamma \rightarrow (c_1) \gamma_1) (c_2; c_3) \gamma_3$,

Second expression of $(\gamma \rightarrow (c_1; c_2) \gamma_2) (c_3)$ using the 2nd assumption gives

$(\gamma \rightarrow (c_1; c_2) \gamma_2) (c_3)$ gives γ_3 ,

Hence both the sequence gives the same table γ_3 , Hence they are associative.

If one of c_1, c_2, c_3 doesn't terminate then neither does $(c_1; c_2); c_3$ and $c_1; (c_2; c_3)$.