Quiz 8: Lazy Evaluation

Graded

Student

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Total Points

0 / 5 pts

Question 1

Lazy Evaluation/Call-by-Name

0 / 5 pts

- **+ 1 pt** For arriving at (\y.e)O
- **+ 2 pts** Handling the case of e not containing y
- **+ 2 pts** Handling the case of e containing y
- ✔ **+ 0 pts** Empty/Incorrect

Q1 Lazy Evaluation/Call-by-Name
5 Points

Let Ω denote an expression which does not terminate --- its evaluation/calculation in even lazy i.e., call-by-name) semantics does not terminate. Let e be any expression.

Using lazy evaluation (call-by-name) rules, what answer does one get for calculating the value of the expression $((\lambda x.\lambda y.x)\ e)\ \Omega$, starting with an initial table γ.

[You may write |- instead of $\vdash$, g instead of γ, O instead of Ω, \ instead of λ, and < > *instead of* $\langle\!\langle\ \rangle\!\rangle$ in your answer].

1.((\x.\y.x) e) O
2.Apply the outermost function ((\x.\y.x) e) to the argument O.
To apply a function to an argument in call-by-name evaluation, we substitute the argument directly into the function body without evaluating it. So, we substitute O for x in the function body (λy.x):
1.(\y.x)[x := O]
2.(\y.O)
Now, we have a new function (\y.O). Next, we apply this function to the argument O:
1.(\y.O) O
Again, we substitute O for y in the function body (O):
1.O[O/y]
2.O