Derivation Exercise

How to execute the Racket factorial program given these parts?

Warning: cannot start the following way:

- factorial machine (I)
- factorial-in-Racket program
- Racket interpreter machine (I)

Why not?
The derivation would need to begin:

- factorial machine (I)
- factorial-in-Racket program
- Racket interpreter machine (I)
  - Racket-interpreter-in-L program
  - L interpreter machine

But the parts don’t include Racket-interpreter-in-L program for any L!

What to do? Explore translating the factorial-in-Racket program to a factorial-in-L program for some L for which we *can* make an interpreter machine!

SOLUTION:

factorial machine (I)

- factorial-in-Python program (T)
  - factorial-in-Racket program
  - Racket-to-Python translation machine (I)
    - Racket-to-Python-translator-in-Python program
    - Python interpreter machine (I)
      - Python-interpreter-in-x86 program (T)
        - Python-interpreter-in-C program
        - C-to-x86-translator-in-x86 machine (I)
          - C-to-x86-translator-in-x86 program
          - x86 computer (= x86 interpreter machine)
      - x86 computer (= x86 interpreter machine)

- Python interpreter machine (I)
  # Derivation already given above; no need to rederive it!
  # A reused derivation is a lemma, which corresponds to
  # a helper function in programming