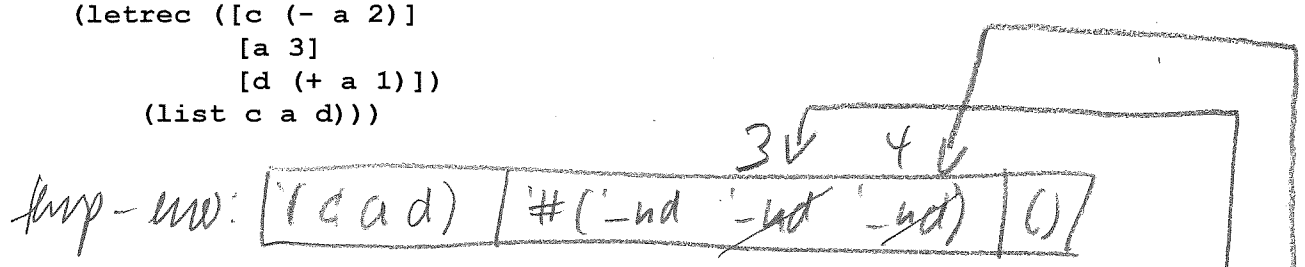
CSSE 340, Letrec Worksheet

Evaluate the following expression. Draw all closure and environments in the order in which they are evaluated.

```
(letrec ([c (- a 2)]
         [a 3]
         [d (+ a 1)])
    (list c a d)))
```



(1) evaluate "(- a 2)" in temp-env:
→ error, because "a" is '_nd.

ordinarily, evaluation would stop,
suppose we move on.

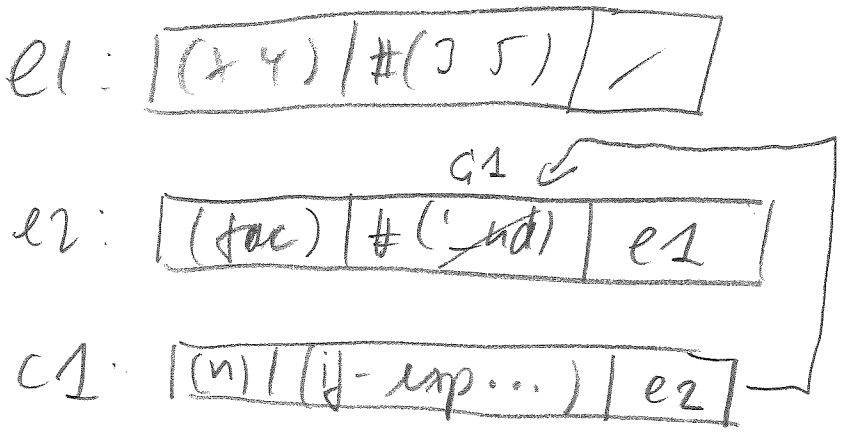
(2) evaluate 3 in temp-env:
→ 3
→ now, modify the vector to:

(3) evaluate "(+ a 1)" in temp-env:
"a" is found & has a value of 3
→ (+ 3 1) → 4
→ now, modify vector to:

(4) evaluate body.

Evaluate the following expression. Draw all closure and environments in the order in which they are evaluated.

```
(let ([x 3]
      [y 5])
  (letrec ([fac (lambda (n)
                  (if (= n 0)
                      1
                      (* n (fac (- n 1)))))])
    (fac 1)))
```



inside body of letrec: (fac 1) in e2:

→ (c1 1)

inside body of c1: (if exp ...)

→ key question, do we have access to fac?

→ we depth of e3, 0 then found fac in e2.

⋮

eventually, we need to evaluate (fac 0)