

Quiz 9:

LabA:

Question:

Consider the define-datatype given for environment definition in LETREC. Fill in the blanks.

```
(define-datatype environment environment?
  (empty-env)
  (extend-env
    (var identifier?)
    (val expval?)
    (env environment?))
  (extend-env-rec
    (p-name [A] )
    (b-var [B] )
    ( [C] expression?)
    (env environment?)))
```

Solution:

[A] → identifier?

[B] → identifier?

[C] → body

LabB:

Question:

In 50 words, discuss the main difference between LET and LETREC. In particular, state which part(s) of the code in LET has been changed for LETREC and how it makes recursive calls available?

Solution:

The main difference is that LETREC allows recursive procedures through a change in the extend-env function. In LETREC, when a recursive procedure is created, it is immediately stored in the extended environment with its body and name, allowing recursive calls.

Note: See EOPL pg. 83 for more detailed information

Quiz 10:

LabA:

Question:

In 50 words, explain the difference between dynamic and static scoping.

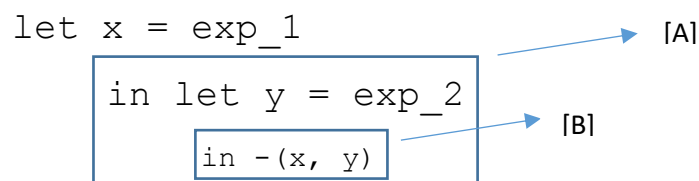
Solution:

Dynamic bindings are determined during runtime whereas in static bindings, the variables refer to their top level environment.

LabB:

Question:

Consider the contour diagram given below. For each rectangle, write which variable's scope it represents.



Solution:

[A] → Scope of x

[B] → Scope of y