# Ambiente
# Run-time & Run-time Simulation

# Un esempio

```
let  n = 5;;
let h = fun x -> n + x ;;
let rec f g n = if n = 1 then g(n) else n * f g (n-1);;
f h 2;;
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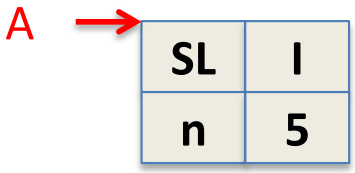
# Run-time Stack

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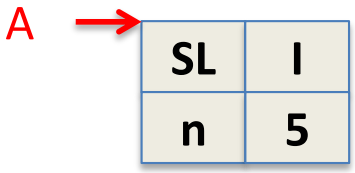
# Run-time Stack: simulation

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Env_A(m) = unbond
for all m != n

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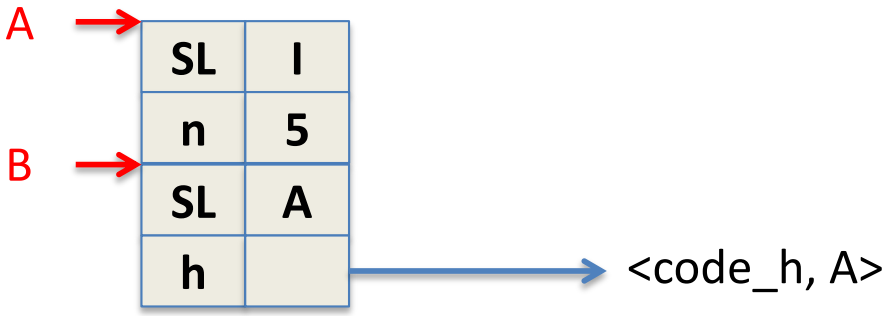


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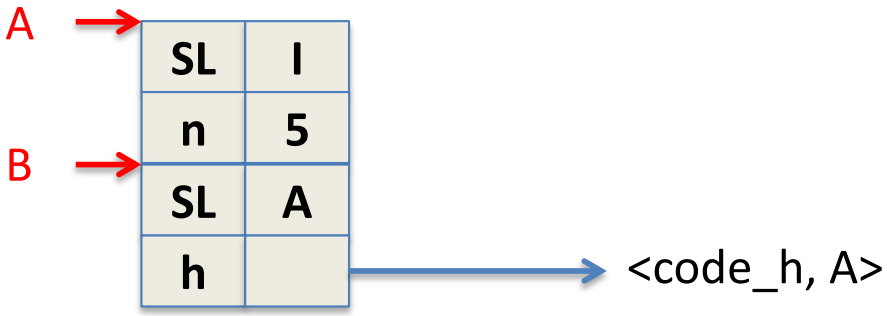


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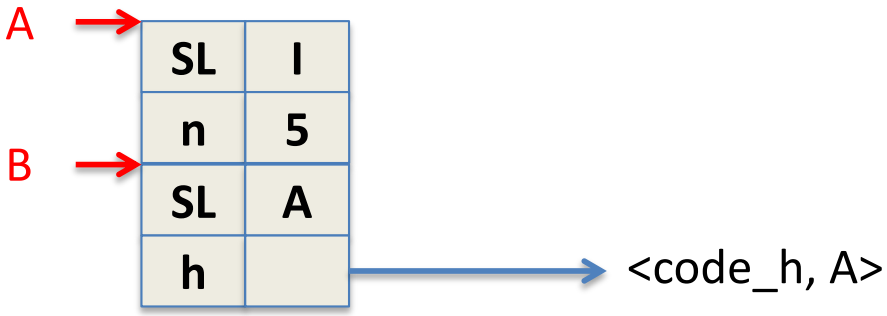


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```
:
Let(h, fun(x, Plus(n,x)), ebody) ->
 let fclosure = eval fun(x, Plus(n,x)), env_A) in
  eval ebody (bind env_A h fclosure)
(* fclosure= Closure(x, Plus(n,x), env_A) *)
```

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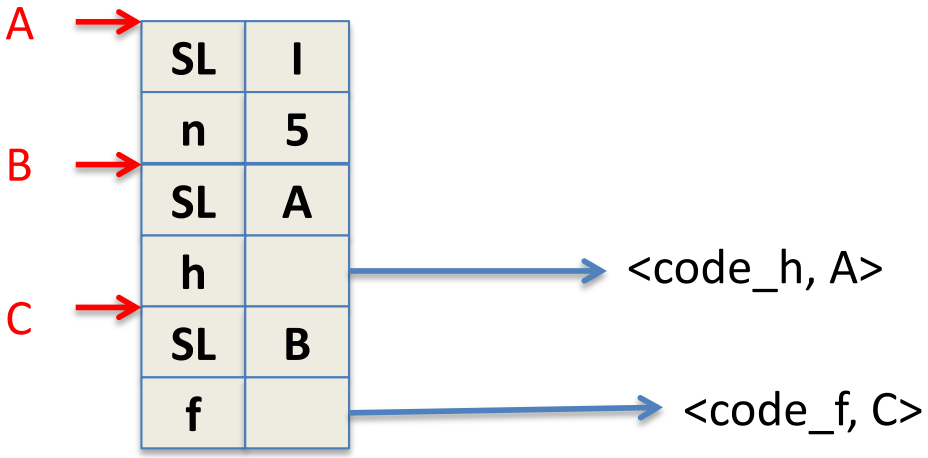


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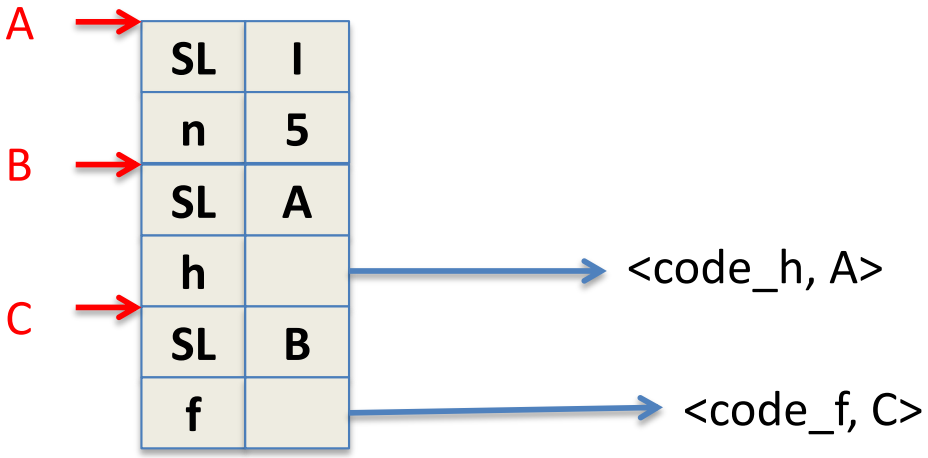


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Env_C(f) = <code_f, Env_C>
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Env_C(n) = 5

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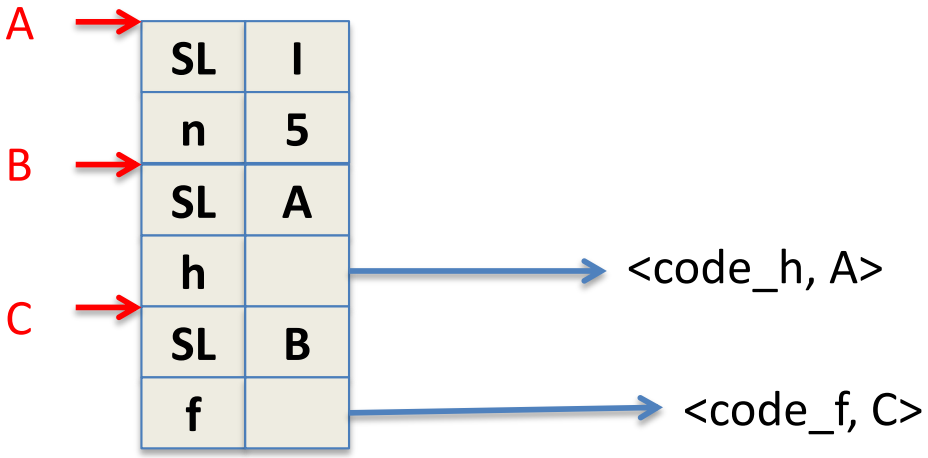


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Definizione ricorsiva:

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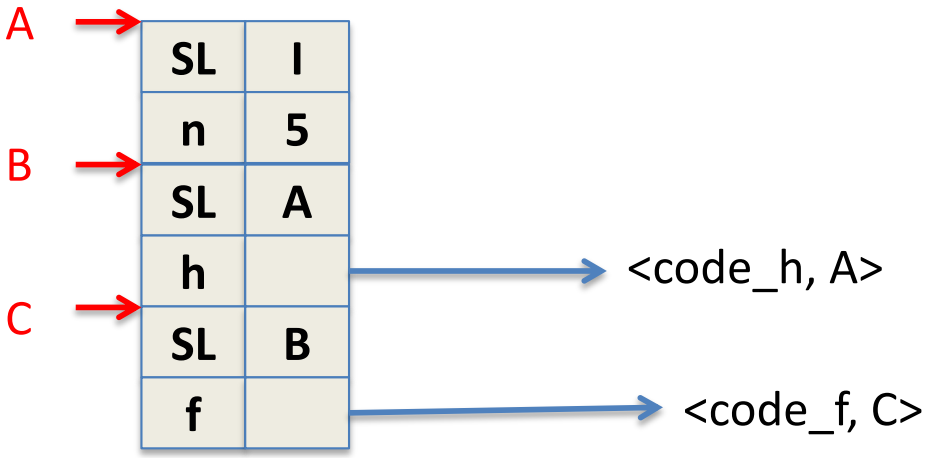


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```
:
| Letrec(f, par, fBody, letBody) ->
   let benv =
     bind(env_C, f, (Recfunval(f, par, fBody, env_C)))
      in eval(letBody, benv)
:
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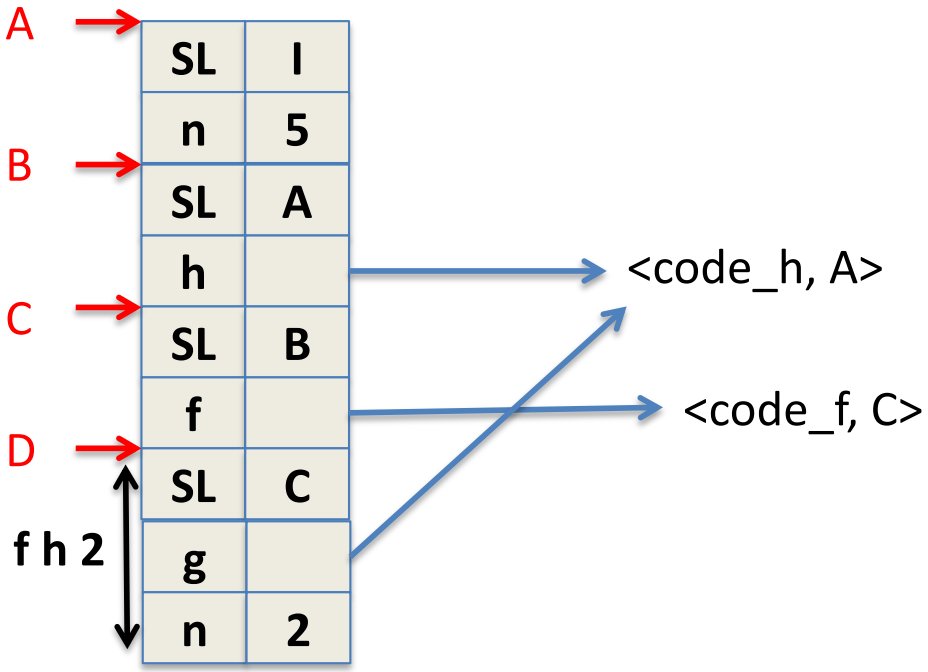


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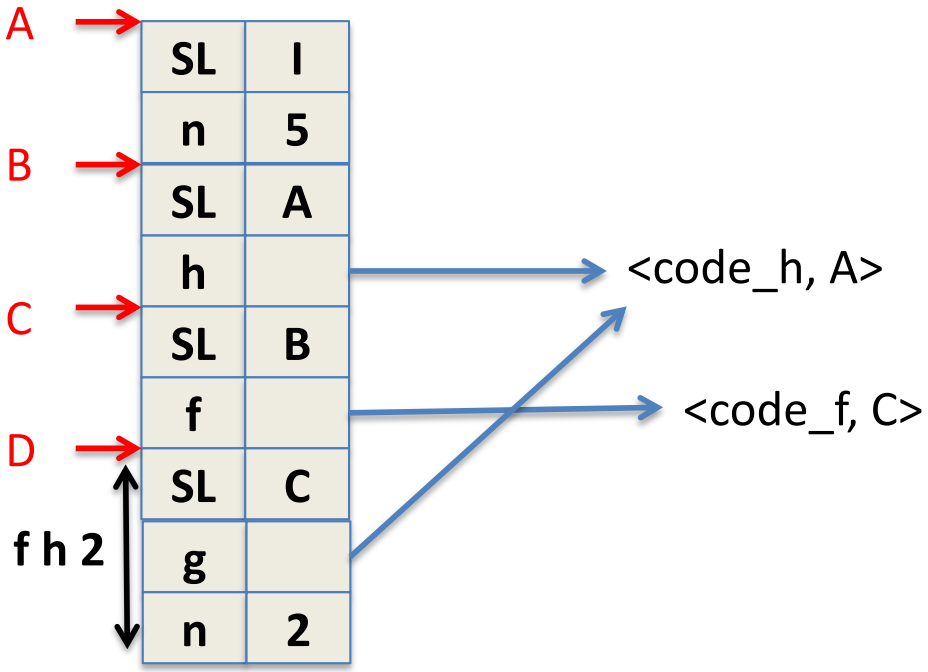


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Env_C(n) = 5

Env_D(g) = <code_h, Env_A>
Env_D(n) = 2
Env_D(f) = <code_f, Env_C>
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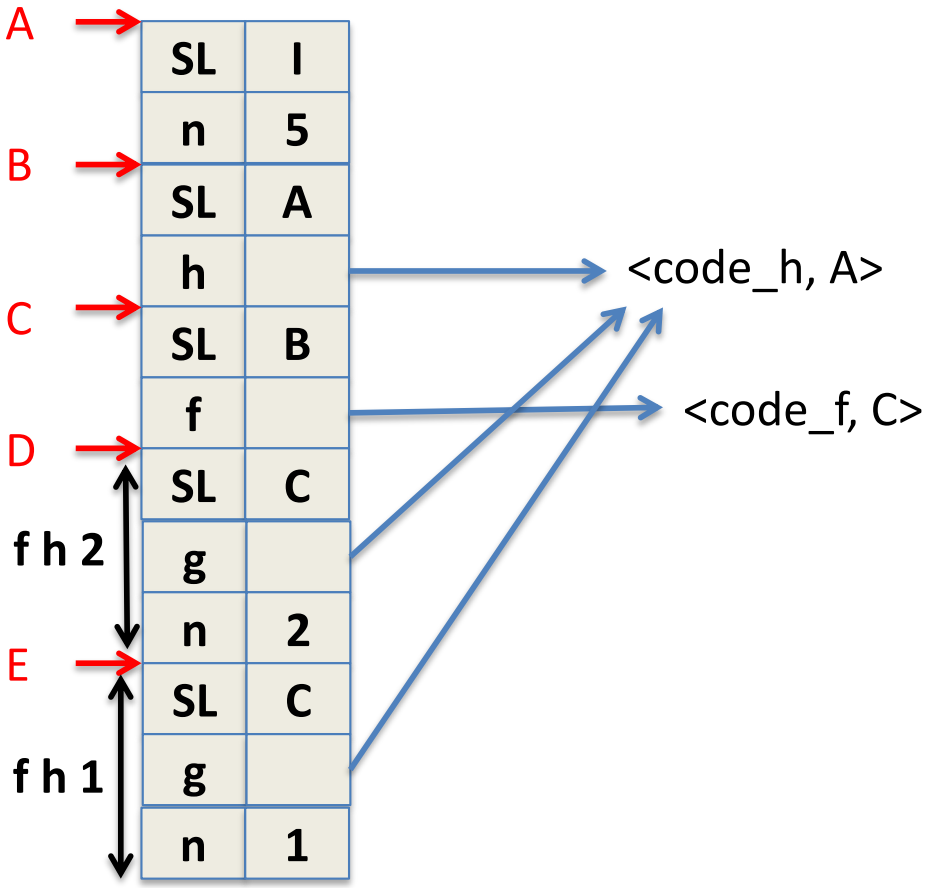


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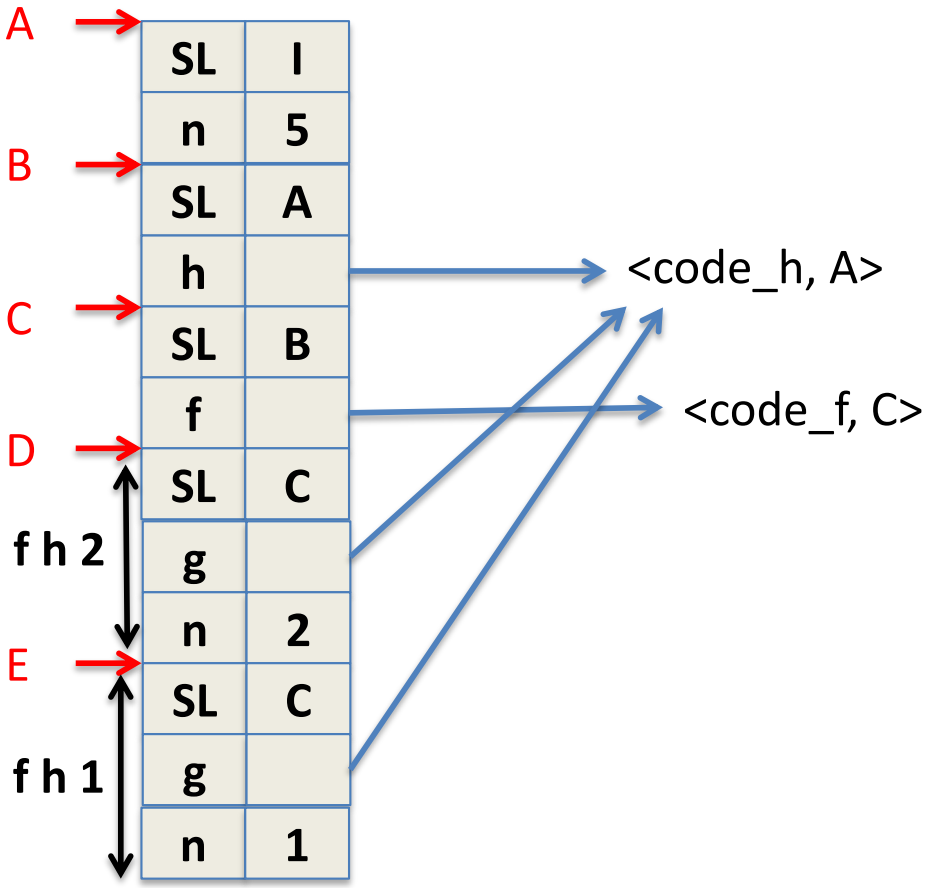


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Env_E(n) = 1
Env_E(f) = <code_f, Env_C>
Env_E(h) <code_h, Env_A>