Chap.8 Memory Allocation

8.1   (pp230-231 reading)

8.2   : Unit Program (module, block)

o
  cf) local variable :
  cf) activated state : unit program
    o unit activation :
          - code segment :   ,
          - <u>activation record</u> : local var +   ,
    o unit activation   referencing environment
  (p232 reading)   : local var + nonlocal var

8.3 Static Memory Allocation

  cf) <u>FORTRAN IV</u>, COBOL
    main program
    + sub program

  o   unit program   local var

  o activation record
  o var lifetime :   (static variable)
  o var scope :   unit program

    pp232-234

8.4 Stack   Memory Allocation

  cf) Algol-like Language : Compiler language
      Pascal, C Algol 60, 68, PL/1, Ada

      :   var scope
        unit program (<u>block</u>)   <   8.2>
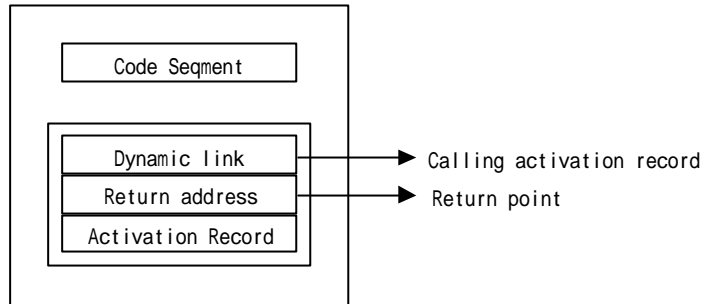   disjoint   nested(static)
          o block :   activation,
                                          environment
          o subprogram :

    activation record
    unit program   activation record

activation record

8.4.1 Activation Record
  o unit program   Activation

  o unit program   local var
  o local var
  o activation record   offset
  o   unit program   activation
   activation record
                                    binding(semistatic variable)
  o Call   : activation   (8.4)
                : Stack   (8.5)

8.4.2 Unit Program   activation   activation record
  o activation record   activation record   local var

  o unit program   activation   local var
          local var
  eg) Algol 68
       dynamic array :
                  (semidynamic array)
     m, n : non-local var

     [1:m] int a
     [1:n] real b > m   n   activation

     ___   semistatic var   semidynamic var
     8.7   semidynamic var
            activation record   activation
                                   pointer   binding

8.4.3 Activation Record
  o

activation record
o <u>dynamic var</u>
"Pointer"
o activation record
"Heap"
(   )

8.4.4 Non-local variable
eg) FORTRAN
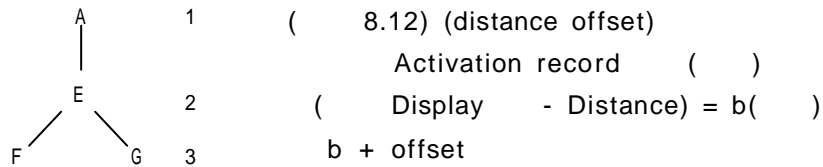o global variable   activation record
unit program
o global var   binding

static link
:   activation record   point
reference time   (8.10,   8.11)

display
:   Display
: static chain   1_____array

```
A          1        (      8.12) (distance offset)
|                           Activation record      (     )
|
E          2        (      Display    - Distance) = b(     )
/ \
F     G    3           b +  offset
```

* activation record   DISPLAY

8.5 Heap
eg) APL   (8.14)
: activation record   entry   Heap
Pointer