Chap.9   (Subprogram)

9.1

  cf) subprogram - function :   cf)pascal
                 - subroutine/procedure :

) procedure:
                    function   subroutine   subprogram

  pp258- 259 subprogram

    procedure name (formal_para. list)
        declarations
        body
    end

pp260- 261

o actual parameter
o formal parameter
o parameter association
            -                    (positional parameter association)
            -                    (named parameter association)

) procedure TEST(A, B: in REAL; C: in INTEGER;)

        - - - > TEST(0.1, 100.0, 50)
            TEST(A=>0.1, B=>100.0, C=>50)
            TEST(B=>100.0, A=>0.1, C=>50)

p.263   3

9.2

p.263
  * formal parameter   * actual parameter
   : subprogram   :
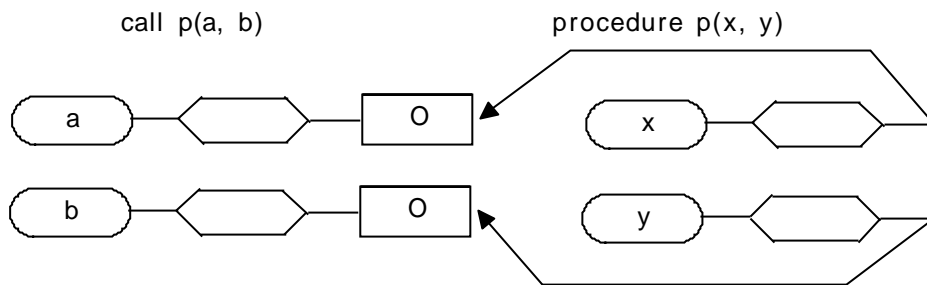
p.264

(fortran) SUBROUTINE P(A, B)   CALL P(X, Y*Z)

(Algol)   procedure P(A, B)   P(X, Y*Z)

      callee   caller

p.264

call by reference (by address, by location)

: actual parameter   formal parameter

eg) Fortran, PL/1

call p(a, b)   procedure p(x, y)

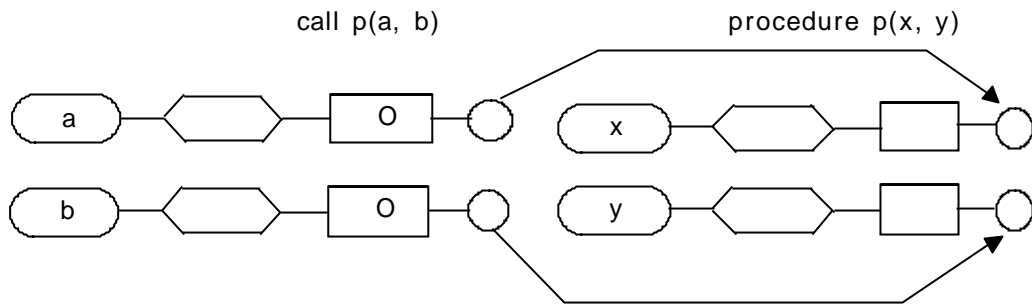(i) caller   actual parameter

(ii) actual parameter

      o variable

      o

      o array element

(iii)   callee

pp. 265   ˜ 266   reading

"side-effects"

call by value

) C, PASCAL

call p(a, b)   procedure p(x, y)


```
 _____
(i) caller     actual parameter
(ii) callee    r- value                                     formal parameter
                                 local variable              .
```

* actual parameter   .

* call by value   caller
   callee   .

- - >   : "call- by- result"


```
          _____
          (i) callee    formal para.                                   ,
          (ii) caller   actual para.   formal para.            epilog
```

call by name

    : formal para.   actual para.

                        r- value, l- value

eg)

```
procedure EXCHANGE(X, Y)      <-      call EXCHANGE(J, N(J))
        integer TEMP                          integer TEMP
        begin                                 begin
                TEMP = X                              TEMP = J
                X = Y                                 J = N(J)
                Y = TEMP                              N(J) = TEMP
        end                                   end
```

p.274
  9.3

p276
  9.4   (side-effects)   (aliasing)

p.276 * side-effects
    :
      call-by-reference, call-by-name
    p276~277 reading

p.277 * alias
    :   variable
        var.
                          .

pp279~282
9.5

p.282 generic function

p.284
9.6 Coroutine
:   procedure
      procedure   procedure

      p285   9.6