第六章 陣列

1. DIM 變數(n,m,..) {宣告陣列}　　變數 ==> 可為數值或字串變數

* DIM 變數(n)　　==> 一維陣列
* DIM 變數(n, m)　==> 二維陣列

【例題 6-1】

LIST 1 '********** DIM-1 ********** DIM-1.BAS 10 DIM S(5) 20 PRINT "******* INPUT DATA ******" 30 FOR I = 1 TO 5 40 PRINT I; ": "; 50 INPUT "",S(I) 60 NEXT I 70 PRINT "******* PRINT DATA ******" 80 FOR I = 1 TO 5 90 PRINT I; ":"; S(I) 100 NEXT I Ok	RUN ******* INPUT DATA ****** 1 : 90 2 : 80 3 : 88 4 : 98 5 : 85 ******* PRINT DATA ****** 1 : 90 2 : 80 3 : 88 4 : 98 5 : 85 Ok

【例題 6-2】輸入 10 個數值, 判斷奇偶數

```
LIST
10  '************** ODD & EVEN *********** ODD.BAS
20  CLS
30  DIM A(10), B(10)
40  FOR I = 1 TO 10
50      READ X
60      Q = X / 2
70      IF Q = INT(Q) THEN 110
80      N = N + 1
90      A(N) = X
100     GOTO 130
110     M = M + 1
120     B(M) = X
130 NEXT I
140 '
150 PRINT "ODD : "
160 FOR I = 1 TO N
170     PRINT A(I),
180 NEXT I
190 '
200 PRINT: PRINT "EVEN : "
210 FOR I = 1 TO M
220     PRINT B(I),
230 NEXT I
300 DATA 22,45,68,24,13
310 DATA 12,45,20,33,17
Ok
ODD :
 45          13          45          33          17

  EVEN :
   22          68          24          12          20
  Ok
```

【例題 6-3】PASCAL 三角形

```
LIST
10 ' *** PASCAL test *** pas.bas
20 CLS
30 INPUT "KEY IN A NUMBER : ", N
40 DIM A(N), B(N)
50 FOR I = 1 TO N
60     PRINT SPC(N * 2 - I * 2);
70     FOR J = 1 TO I
80         IF J = 1 OR J = I THEN A(J) = 1
                        ELSE A(J) = B(J-1) + B(J)
90         PRINT USING "####"; A(J);
100    NEXT J
110    PRINT
120    FOR K = 1 TO I
130        B(K) = A(K)
140    NEXT K
150 NEXT I
160 END
Ok
```

```
RUN
KEY IN A NUMBER : 8
              1
            1   1
          1   2   1
        1   3   3   1
      1   4   6   4   1
    1   5  10  10   5   1
  1   6  15  20  15   6   1
1   7  21  35  35  21  7   1
Ok
```

【例題 6-4】輸入 10 個學生分數, 將及格和不及格分別列出

```
LIST
10 '*********** STUDENT SCORE -1 ********** STU-1.BAT
20  CLS
30  DIM A(10), B(10)
40  FOR I = 1 TO 10
50      READ S
60      IF S < 60 THEN 100
70      N = N + 1
80      A(N) = S
90      GOTO 120
100     M = M + 1
110     B(M) = S
120 NEXT I
130 '
140 PRINT "PASS: "
150 FOR I = 1 TO N
160     PRINT A(I),
170 T1 = T1 + S
180 NEXT I
190 PRINT: PRINT "TOTAL = "; T1
200 '
210 PRINT: PRINT "FAIL: "
220 FOR I = 1 TO M
230     PRINT B(I),
240 T2 = T2 + S
250 NEXT I
260 PRINT: PRINT "TOTAL = "; T2
300 DATA 90,76,56,87,45
310 DATA 55,78,98,67,60
Ok
RUN
PASS:
 90          76          87          78          98
 67          60
TOTAL =  420

 FAIL:
 56          45          55
 TOTAL =  180
 Ok
```

【例題 6-5】

```
LIST
10  '********** DIM-2 *********** DIM-2.BAS
20 CLS
30 INPUT "ENTER STUDENT NUMBER : ", N
40 DIM NO$(N), NAM$(N), SCORE(N)
50 PRINT "******* INPUT DATA ******"
60 FOR I = 1 TO N
70     PRINT TAB(10); I
80     PRINT STRING$(20, "=")
90     INPUT "NO.   : ", NO$(I)
100    INPUT "NAME  : ", NAM$(I)
110    INPUT "SCORE : ", SCORE(I)
120 NEXT I
130 PRINT : PRINT
140 PRINT "******* PRINT DATA ******"
150 PRINT      " NO.      NAME      SCORE"
160 PRINT      " ===      =====     ====="
170 FOR I = 1 TO N
180     PRINT USING " \\      \   \     ###.#";
                NO$(I), NAM$(I), SCORE(I)
190 NEXT I
200 PRINT      " ===      =====     ====="
Ok
```

```
RUN
ENTER STUDENT NUMBER : 3
******* INPUT DATA ******
        1
====================
NO.   : 001
NAME  : John
SCORE : 78
        2
====================
NO.   : 002
NAME  : Mary
SCORE : 90
        3
====================
NO.   : 003
NAME  : Bob
SCORE : 80

******* PRINT DATA ******
 NO.      NAME    SCORE
 ===      =====   =====
 001      John     78.0
 002      Mary     90.0
 003      Bob      80.0
 ===      =====   =====
Ok
```

【例題 6-6】

```
LIST
10  '********** DIM-3 ********** DIM-3.BAS
20 CLS
30 INPUT "ENTER STUDENT NUMBER : ", N
40 DIM NO$(N), NAM$(N), CHI(N), CHE(N), MAT(N)
50 PRINT "******* INPUT DATA ******"
60 FOR I = 1 TO N
70     PRINT TAB(10); I
80     PRINT STRING$(20, "=")
90     INPUT "NO. : ", NO$(I)
100    INPUT "NAME: ", NAM$(I)
110    INPUT "CHI : ", CHI(I)
120    INPUT "CHE : ", CHE(I)
130    INPUT "MAT : ", MAT(I)
140 NEXT I
150 PRINT : PRINT
155 '
160 PRINT "******* PRINT DATA ******"
170 PRINT " NO.   NAME    CHI    CHE    MAT    AVE  DOWN"
180 PRINT " ===   =====  =====  =====  =====  ===== ====="
190 FOR I = 1 TO N
200     AVE = (CHI(I) + CHE(I) + MAT(I)) / 3
210     DOWN$ = " "
220     IF AVE < 60 THEN DOWN$ = "*"
230     PRINT USING " \\  \  \  ###.#  ###.#  ###.#  ###.#   !";
NO$(I),NAM$(I),CHI(I),CHE(I),MAT(I),AVE,DOWN$
240 NEXT I
250 PRINT  " ===   =====  =====  =====  =====  ===== ====="
Ok
RUN
ENTER STUDENT NUMBER : 3
******* INPUT DATA ******
        1
====================
NO. : 001
NAME: John
CHI   : 80
CHE  : 88
MAT : 90
        2
====================
NO. : 002
NAME: Mary
CHI   : 80
CHE  : 60
MAT : 56
        3
====================
NO. : 003
NAME: Bob
CHI   : 70
CHE  : 40
MAT : 50
******* PRINT DATA ******
 NO.   NAME   CHI      CHE     MAT    AVE   DOWN
 ===   =====  =====  =====  =====  ===== ====
 001   John     80.0    88.0    90.0    86.0
 002   Mary     80.0    60.0    56.0    65.3
 003   Bob      70.0    40.0    50.0    53.3     *
 ===   =====  =====  =====  =====  ===== ====
Ok
```

2.設定陣列的最小註標值

OPTION BASE n {設定陣列的最小註標值} n 只可為 0 或 1, 內定為 0

3.清除列陣

ERASE 陣列名稱 [,陣列名稱] {清除列陣}

【例題 6-7】

```
LIST
10 '**** erase test **** reas-1.bas
20 DIM A(3)
30 FOR I = 1 TO 3
40     A(I) = I
50 PRINT I,
60 NEXT I
70 PRINT
80 DIM A(3)
90 FOR I = 1 TO 3
100     A(I) = I
110 PRINT I,
120 NEXT I
Ok
RUN
 1            2            3
Duplicate Definition in 80
Ok
```

【例題 6-8】

```
LIST
10 '**** erase test **** reas-1.bas
20 DIM A(3)
30 FOR I = 1 TO 3
40     A(I) = I
50 PRINT I,
60 NEXT I
70 PRINT
75 ERASE A
80 DIM A(3)
90 FOR I = 1 TO 3
100     A(I) = I
110 PRINT I,
120 NEXT I
Ok
RUN
 1          2          3
 1          2          3
Ok
```

4.資料互換

SWAP 變數1, 變數2 {資料互換}

【例題 6-9】

```
LIST
10  '***** G.C.D  &  L.C.M *****GCD-1.BAS
20  INPUT "INPUT A,B : ", A, B
30  IF A < B THEN T = A:A = B:B = T
40  BIG = A: SMALL = B
50  R = BIG MOD SMALL
60  IF R = 0 THEN 90
70  BIG = SMALL : SMALL = R
80  GOTO 50
90  GCD = SMALL
100 LCM = A * B / GCD
110 PRINT "G.C.D. = "; GCD
120 PRINT "L.C.M. = "; LCM
Ok
```

```
RUN
INPUT A,B : 12,8
G.C.D. =  4
L.C.M. =  24
Ok
RUN
INPUT A,B : 9,36
G.C.D. =  9
L.C.M. =  36
Ok
```

【例題 6-10】

LIST 10 '***** G.C.D & L.C.M *****GCD-2.BAS 20 INPUT "INPUT A,B : ", A, B 30 IF A < B THEN SWAP A,B 40 BIG = A: SMALL = B 50 R = BIG MOD SMALL 60 IF R = 0 THEN 90 70 BIG = SMALL : SMALL = R 80 GOTO 50 90 GCD = SMALL 100 LCM = A * B / GCD 110 PRINT "G.C.D. = "; GCD 120 PRINT "L.C.M. = "; LCM Ok	RUN INPUT A,B : 12,8 G.C.D. = 4 L.C.M. = 24 Ok RUN INPUT A,B : 9,36 G.C.D. = 9 L.C.M. = 36 Ok

5. 氣泡排序法 (Bubble sort)

【例題 6-11】

LIST 10 '***** BUBBLE SORT ***** BSORT-1.BAS 20 CLS 30 INPUT "How mary number : ", N 40 DIM A(N) 50 FOR I = 1 TO N 60 PRINT I; " : ";: INPUT "", A(I) 70 NEXT I 80 ' 90 '---------- SORT 100 ' 110 FOR I = N-1 TO 1 STEP -1 120 FOR J = 1 TO I 130 IF A(J) > A(J+1) THEN SWAP A(J), A(J+1) 140 NEXT J 150 NEXT I 160 ' 170 '---------- LIST DATA 180 PRINT "***** SORT DATA *****" 190 FOR I = 1 TO N 200 PRINT I; ":"; A(I) 210 NEXT I Ok	RUN How mary number : 5 1 : 3 2 : 2 3 : 5 4 : 1 5 : 4 ***** SORT DATA ***** 1 : 1 2 : 2 3 : 3 4 : 4 5 : 5 Ok

6. 插入排序法 (Insert sort)

【例題 6-12】

```
LIST
10 '****** INSTER SORT ******** ISORT-1.BAS
20 CLS
30 INPUT "How mary number : ", N
40 DIM A(N)
50 FOR I = 1 TO N
60     PRINT I; " : ";: INPUT "", A(I)
70 NEXT I
80 '
90 '----------- SORT
100 '
110 FOR I = 1 TO N-1
120    FOR J = I+1 TO N
130        IF A(I) > A(J) THEN SWAP A(I), A(J)
140    NEXT J
150 NEXT I
160 '
170 '---------- LIST DATA
180 PRINT "***** SORT DATA *****"
190 FOR I = 1 TO N
200     PRINT I; ":"; A(I)
210 NEXT I
Ok
```

```
RUN
How mary number : 5
 1  : 12
 2  : 54
 3  : 11
 4  : 36
 5  : 22
***** SORT DATA *****
 1 : 11
 2 : 12
 3 : 22
 4 : 36
 5 : 54
Ok
```

【例題 6-13】

```
LIST
10 '***** TELSORT ***** TEL.BAS
20 CLS
30 N = 10
40 DIM NAM$(N), TEL(N)
50 FOR I = 1 TO N
60     READ NAM$(I), TEL(I)
70 NEXT I
80 '
90 '---------------- DATA SORT
100 '
110 FOR I = 1 TO N - 1
120    FOR J = 1 TO I
130        IF NAM$(I) < NAM$(J) THEN SWAP NAM$(I), NAM$(J):
                        SWAP TEL(I), TEL(J)
140    NEXT J
150 NEXT I
160 '
170 '--------------- DATA LIST
180 '
190 PRINT "NO : NAME          TEL_NO "
200 PRINT "== : ==========     ======="
210 FOR I = 1 TO N
220     PRINT USING "## : \       \     #######"; I; NAM$(I), TEL(I)
230 NEXT I
240 PRINT "== : ==========     ======="
250 END
260 '
300 DATA JOHN,3533591,NANCY,3022574
310 DATA LUCK,7670609,MARY,3564784
320 DATA ROBERT,3213414,BOB,9112437
330 DATA ALICE,7210381,WANG,6532872
340 DATA LEE,7676534,PAUL,5221050
Ok
RUN
NO : NAME          TEL_NO
== : ==========    =======
 1  : ALICE          7210381
 2  : BOB            9112437
 3  : JOHN           3533591
 4  : LEE            7676534
 5  : LUCK           7670609
 6  : MARY           3564784
 7  : NANCY          3022574
 8  : ROBERT         3213414
 9  : WANG           6532872
10 : PAUL           5221050
== : ==========    =======
Ok
```