第五章 函數數值

1. SQR (n) {平方根}

【例題 5-1】

```
PRINT SQR(25)
 5
Ok
PRINT SQR(2)
 1.414214
Ok

PRINT 25^(1/2)
 5
Ok
PRINT 8^(1/3)
 2
Ok
```

2. ABS (變數) {取絕對值}

【例題 5-2】

```
LIST
10 A = -5
20 PRINT A
30 PRINT ABS(A)
Ok
RUN
-5
 5
Ok
```

【例題 5-3】畫磚紋 - 1

```
LIST
1  REM *** PRINT DRAW "*" -1
****DRAW1.BAS
10 FOR I = -5 TO 5
20     Z = ABS(I)
30     M = 11 - 2 * Z
40     PRINT TAB(2+Z)
50     FOR J = 1 TO M
60         PRINT "*";
70     NEXT J
80     PRINT
90 NEXT I
99 END
Ok
```

```
RUN
     *
    ***
   *****
  *******
 *********
***********
 *********
  *******
   *****
    ***
     *
Ok
```

【例題 5-4】畫磚紋 - 2

```
LIST
1  REM *** PRINT DRAW "*" -2
****DRAW2.BAS
10 FOR I = -5 TO 5
20     FOR J = -5 TO 5
30         IF ABS(I) + ABS(J) <= 5 THEN PRINT "*";
                                ELSE PRINT " ";
40     NEXT J
50     PRINT
60 NEXT I
99 END
Ok
```

```
RUN
     *
    ***
   *****
  *******
 *********
***********
 *********
  *******
   *****
    ***
     *
Ok
```

【例題 5-5】列出如下之磚紋 : 畫磚紋 - 3

```
     *
    * *
   *   *
  *     *
 *       *
*         *
 *       *
  *     *
   *   *
    * *
     *
```

【解答 5-5】

```
LIST
1  REM *** PRINT DRAW "*" -3
****DRAW3.BAS
10 FOR I = -5 TO 5
20     Z = ABS(I)
30     M = 11 - 2 * Z
40     PRINT TAB(2+Z)
50     FOR J = 1 TO M
60        IF J = 1 OR  J = M THEN  PRINT "*";
                       ELSE  PRINT " ";
70     NEXT J
80     PRINT
90 NEXT I
99 END
Ok
```

```
RUN
     *
    * *
   *   *
  *     *
 *       *
*         *
 *       *
  *     *
   *   *
    * *
     *
Ok
```

【例題 5-6】畫磚紋 - 4

```
1  REM *** PRINT DRAW "*" -4
****DRAW4.BAS
10 FOR I = -5 TO 5
20     FOR J = -5 TO 5
30        IF ABS(I) + ABS(J) = 5 THEN PRINT "*";
                          ELSE PRINT " ";
40     NEXT J
50     PRINT
60 NEXT I
99 END
Ok
```

```
RUN
     *
    * *
   *   *
  *     *
 *       *
*         *
 *       *
  *     *
   *   *
    * *
     *
Ok
```

3. INT(n) {取整數}

4. FIX(n) {去小數}

【例題 5-7】

INT	FIX
PRINT INT(5.6) 5 Ok PRINT INT(-5.6) -6 Ok	PRINT FIX(5.6) 5 Ok PRINT FIX(-5.6) -5 Ok

【例題 5-8】輸入一數值 N, 判斷是否爲整數

```
LIST
10 '*** INT test *** int.bas
20 INPUT "ENTER A NUMBER : ", N
30 IF N = INT(N) THEN PRINT "INTEGER !!!"
              ELSE PRINT "NOT INTEGER !!!"
40 END
Ok
RUN
ENTER A NUMBER : 12
INTEGER !!!
Ok
RUN
ENTER A NUMBER : 5
INTEGER !!!
Ok
RUN
ENTER A NUMBER : 66.4
NOT INTEGER !!!
Ok
```

5. READ 變數

:

:

:

DATA 資料1,資料2,....資料n

變數 ==> 可爲數值或字串變數

資料 ==> 可爲數值或字串常數

【例題 5-9】

```
LIST
10 '*** READ ... DATA .. **** read.bas
20 FOR I = 1 TO 5
30     READ A
40     PRINT A;
50 NEXT I
99 END
100 '
110 DATA 1,2,5,6,3
Ok
RUN
 1  2  5  6  3
Ok
```

【例題 5-10】

```
LIST
10 '*** READ ... DATA .. **** read-1.bas
20 FOR I = 1 TO 5
30     READ A, NAM$
40     PRINT A, NAM$
50 NEXT I
99 END
100 '
110 DATA 1001,"JOHN"
120 DATA 1002,"MARY"
130 DATA 1003,"WANG"
140 DATA 1004,"LEE"
150 DATA 1005,"BOB"
Ok
RUN
 1001        JOHN
 1002        MARY
 1003        WANG
 1004        LEE
 1005        BOB
Ok
```

【例題 5-11】

```
LIST
10 '************ STU-2 ********** STU-2.BAS
20 CLS
30 PRINT "INPUT DATA : "
40 FOR I = 1 TO 20
50     READ S
60     PRINT S,
70 IF S >= 90 THEN S9 = S9 + 1
     ELSE IF S >= 80 THEN S8= S8 + 1
       ELSE IF S >= 70 THEN S7 = S7 + 1
         ELSE IF S >= 60 THEN S6 = S6 + 1
           ELSE S5 = S5 + 1
80 NEXT I
90 PRINT
100 '
110 PRINT "100 - 90 : "; S9
120 PRINT " 89 - 80 : "; S8
130 PRINT " 79 - 70 : "; S7
140 PRINT " 69 - 60 : "; S6
150 PRINT " 59 -    : "; S5
160 '
200 DATA 56,67,83,92,43
210 DATA 82,94,77,78,63
220 DATA 69,76,58,65,72
230 DATA 81,64,73,61,56
Ok
RUN
INPUT DATA :
 56          67          83          92          43
 82          94          77          78          63
 69          76          58          65          72
 81          64          73          61          56

100 - 90 :  2
 89 - 80 :  3
 79 - 70 :  5
 69 - 60 :  6
 59 -     :  4
Ok
```

【例題 5-12】

```
LIST
10 '********** STU-4 ********* STU-4.BAS
20 PRINT "  NO "; TAB(9); "S1"; TAB(13); "S2"; TAB(17); "S3";
       TAB(21); "S4"; TAB(26); "TOTAL"; TAB(33); " AVG "
30 PRINT " ====="; TAB(9); "=="; TAB(13); "=="; TAB(17); "==";
       TAB(21); "=="; TAB(25); "======"; TAB(32); "======"
40 FOR I = 1 TO 5
50     READ NO, S1, S2, S3, S4
60     SUM = S1 + S2 + S3 + S4
70     AVG = SUM / 4
80     PRINT NO; TAB(8); S1; TAB(12); S2; TAB(16); S3;
          TAB(20); S4; TAB(24); SUM; TAB(31); AVG
90 NEXT I
100 PRINT " ====="; TAB(9); "=="; TAB(13); "=="; TAB(17); "==";
       TAB(21); "=="; TAB(25); "======"; TAB(32); "======"
110 DATA 1001,62,70,89,75
120 DATA 1002,69,82,74,63
130 DATA 1003,72,93,61,65
140 DATA 1004,75,66,84,94
150 DATA 1005,67,89,56,72
Ok
RUN
 NO    S1   S2  S3  S4  TOTAL  AVG
 ====  ==   ==  ==  ==  ======  ======
 1001  62   70  89  75   296    74
 1002  69   82  74  63   288    72
 1003  72   93  61  65   291    72.75
 1004  75   66  84  94   319    79.75
 1005  67   89  56  72   284    71
 ====  ==   ==  ==  ==  ======  ======
Ok
```

6. RESTORE [line no.] {重覆讀取資料}

- 須配合 READ ... DATA ... 使用
- 不加行號時, 再從第一個 DATA 讀取
- 加行號時, 從指定行號的 DATA 讀取

【例題 5-13】

```
LIST
10 '*** restore test *** restore1.bas
20 READ A,B
30 PRINT A,B
40 READ C
50 PRINT C
60 READ D,E
70 PRINT D,E
80 DATA 1,2
90 DATA 3
Ok
RUN
 1          2
 3
Out of DATA in 60
```

【例題 5-14】

```
LIST
10 '*** restore test *** restore1.bas
20 READ A,B
30 PRINT A,B
40 READ C
50 PRINT C
55 RESTORE
60 READ D,E
70 PRINT D,E
80 DATA 1,2
90 DATA 3
Ok
RUN
 1          2
 3
 1          2
Ok
```