Fortran

Chapter 5　迴圈

5-1 Do

使用時機：連續重複執行某一段程式碼時。

Example:

```
Program ex0601
implicit none
integer :: I
integer, parameter :: N=10
do 10, I = 1, N, 1
    write(*,*) 'Do – Loop Demo'
10  continue
stop
end program ex0601
```

迴圈每次的增量，若增量為 1，則可省略

```
(1) do 10, I = 1, N, 1
```

變數 I 的終止數值

設定變數的初值

指定一個行代碼，從本行起到此行代碼間的程式會變成一個

```
10 continue
```

```
(2) do 10, I = 2, N, 2
```

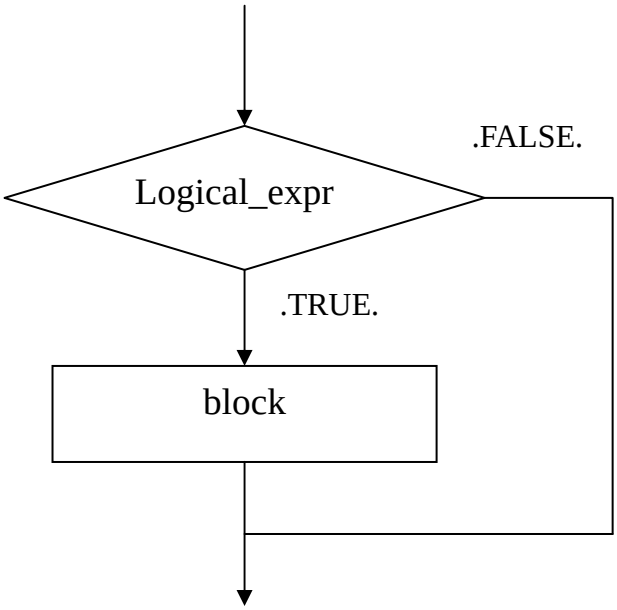
增值設為 2，起始值為 2，=> I = 2, 4, 6, 8, 10

```
(3) do I = 1, N, 1
        write(*,*) 'Do-Loop Demo'
    end do
```

(1) 與(3)相同

5-2 do while

```
do while (logical_expr)
    statement 1
    statement 2
    ……
end do
```



使用時機：不能事先預知會執行幾次的迴圈時。

Example:

```
Program ex0604
    implicit none
    integer, parameter :: Weight=45
    integer :: input = 0
    do while (input /= Weight)
        write(*,*) 'Weight ='
        read(*,*) input
    end do
    write(*,*) 'You are right!'
    stop
end program ex0604
```

5-3 Cycle

cycle：略過迴圈中之後的敘述，直接跳回迴圈的開頭來執行下一次迴圈。

Example:

```
Program ex0605
implicit none
integer :: i
integer, parameter :: n=10
do i = 1, n
    if (i = = 4) cycle
    write(*,*, “(I3)”) I
end do
stop
end program ex0605
```

5-4 Exit

exit：直接跳出一個在運作中的迴圈

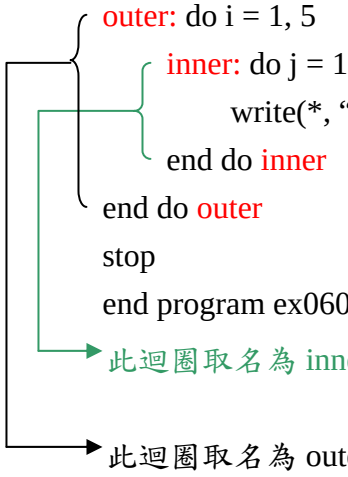
Example:

```
Program ex0606
implicit none
integer, parameter :: Weight=45
integer :: input
do while (.true.)      ←   永久迴圈
    write(*,*) “Weight =”
    read(*,*) input
    if (input = = Weight) exit   ←   等式成立，則跳離此迴圈
end do
write(*,*) “You are right!”
stop
end program ex0606
```

5-5 具名的迴圈

Example:

```
Program ex0607
implicit none
integer :: i, j
outer: do i = 1, 5
    inner: do j = 1, 5
        write(*, "(t2,A1,I3,A1,I3,A1)") '(', i, ',', j,')'
    end do inner
end do outer
stop
end program ex0607
```



5.6 具名迴圈與 cycle，exit 配合使用

Example:

```
Program ex0608
implicit none
integer :: i, j
loop1: do i = 1,3
    loop2:do j = 1,3
        if(j == 2) cycle loop2
        if(i == 2) exit loop1
        write(*,"(t2,A1,I3,A1,I3,A1)") '(',i,',',j,')'
    end do loop2
end do loop1
stop
end program ex0608
```

跳到 loop2 的下一次迴圈

跳出整個 loop1 迴圈(也會同時跳出 loop2 迴圈

output: (1,1),(1,3)