

廻圈

while 迴圈

```
while(執行條件) {  
    程式碼  
    程式碼  
    程式碼  
    ...  
}
```

```
#include <stdio.h>
```

```
int main(void)
```

```
{
```

```
    long num;
```

```
    long sum = 0L;
```

```
    int status;
```

```
    printf("Please enter an integer to be summed ");
```

```
    printf("(q to quit): ");
```

```
    status = scanf("%ld", &num);
```

```
    /* %ld for long, status is the return value */
```

```
    while (status == 1) {          /* == means "is equal to" */
```

```
        sum = sum + num;
```

```
        printf("Please enter next integer (q to quit): ");
```

```
        status = scanf("%ld", &num);
```

```
    }
```

```
    printf("Those integers sum to %ld.\n", sum);
```

```
    return 0;
```

```
}
```

範例 E06_01.c

for 迴圈

```
for( 初始化; 是否繼續執行的條件判斷; 更新變數值) {  
    程式碼  
    程式碼  
    程式碼  
    ...  
}
```

無窮迴圈:

```
for ( ; ; ) {  
    printf("Do something.\n");  
}
```

印出0到9

```
for(i=0;i<10;i=i+1)  
    printf("%d", i);
```

範例E06_11.c

```
#include <stdio.h>
#define CODE 7
int main(void)
{
    int num = 0;

    for(printf("Keep entering numbers!\n"); num != CODE;)
    {
        scanf("%d", &num);
    }
    printf("Bingo!\n");
    return 0;
}
```

判斷執行條件

小於	<
小於等於	<=
相等	==
大於等於	>=
大於	>
不相等	!=

且	&&
或	
非	!

- 剛開始學 C 語言最常犯的錯誤之一就是
就是把 == 寫成 =

注意停止條件

```
int i = 1;
while (i < 5) {
    printf("Hello!\n");
}
```

```
int i = 1;
while (--i < 5) {
    printf("Hello!\n");
}
```

注意停止條件

```
double a = 0;
```

```
while (a != 1.0) {  
    a = a + 1.0/6.0;  
}
```

```
double a = 0;
```

```
while ((a-1) < 0.01 ||  
       (1-a) < 0.01)  
{  
    a = a + 1.0/6.0;  
}
```

浮點數運算的誤差:

a = 0.999999

不等於1.0

停止條件: fabs

```
#include <math.h>
#include <stdio.h>
#define ANSWER 3.14159
int main(void)
{
    double response;

    printf("What is the value of pi?\n");
    scanf("%lf", &response);
    while (fabs(response - ANSWER) > 0.0001) {
        printf("Try again!\n");
        scanf("%lf", &response);
    }
    printf("Close enough!\n");
    return 0;
}
```

true, false

```
#include <stdio.h>
int main(void)
{
    int true_val, false_val;

    true_val = (10 > 2);
    false_val = (10 == 2);
    printf("true = %d; false = %d \n", true_val,
false_val);

    return 0;
}
```

輸出：

```
true = 1; false = 0
```

do ... while 迴圈

```
#include <stdio.h>
#define CODE 13
int main(void)
{
    int code_entered;

    do {
        printf("Please enter the secret code number: ");
        scanf("%d", &code_entered);
    } while (code_entered != CODE); ←
    printf("Bingo!\n");
    return 0;
}
```

Nested Loops 多重迴圈

```
#include <stdio.h>
int main(void)
{
    int i, j;
    for(i = 0; i < 7; i++) {
        for (j = 0; j < 25; j++) {
            printf("*");
        }
        printf("\n");
    }

    return 0;
}
```

輸出：

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

continue 和 break

```
#include <stdio.h>
int main()
{
    int i = 'A';
    do {
        if (i == 'C')
            continue;
        putchar(i);
    } while (++i < 'F');
    return 0;
}
```

輸出：

ABDE

```
#include <stdio.h>
int main()
{
    int i = 'A';
    do {
        if (i == 'C')
            break;
        putchar(i);
    } while (++i < 'F');
    return 0;
}
```

輸出：

AB