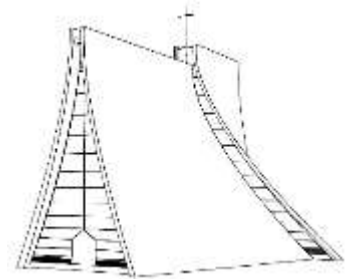




# 運算思維與程式設計

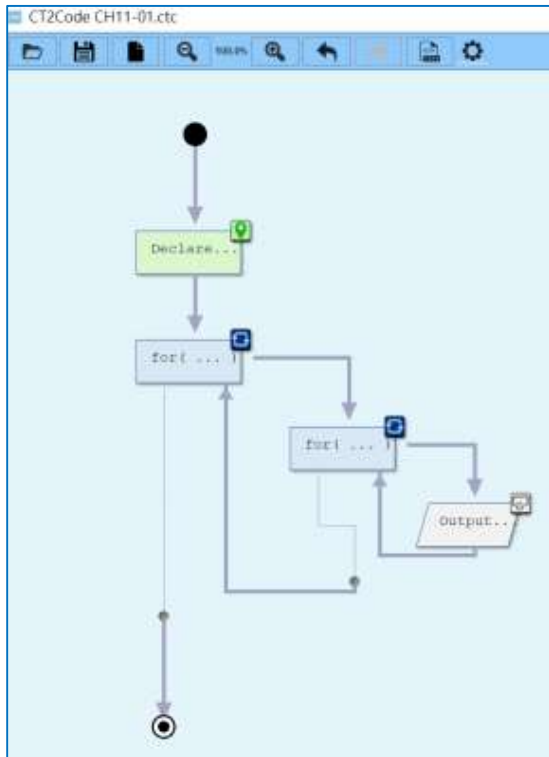
## CH12 進階迴圈控制



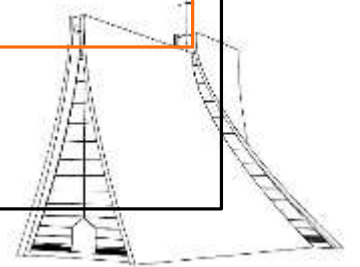


# 巢狀迴圈 (Nested Loops)

迴圈結構內又有其它迴圈存在的情況

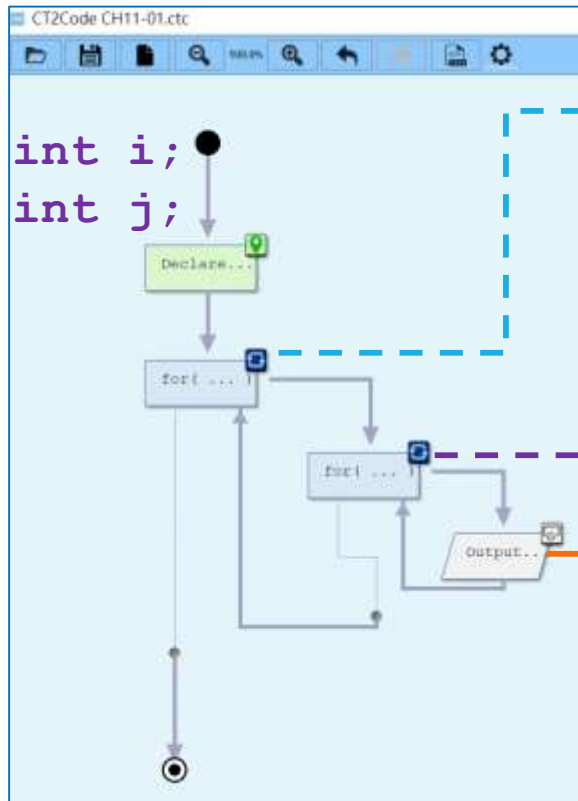


```
for (初始值1; 條件式1; 遞增值1)
{
    .....;
    for (初始值2; 條件式2; 遞增值2)
    {
        敘述句;
        .....;
        .....;
    }
    .....;
}
```





# 範例



For 迴圈設定

變數是否為陣列

陣列索引: 遞增

1

3

確定 取消

For 迴圈設定

變數是否為陣列

陣列索引: 遞增

1

3

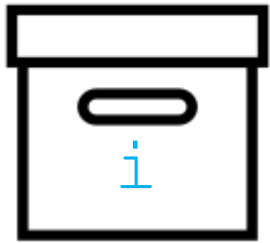
確定 取消

$i + "*" + j + "=" + i * j$

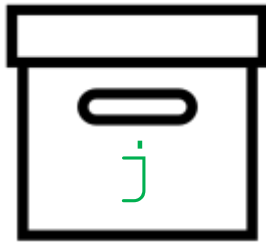
程式碼步驟解析：↓



```
for( i = 1; i <= 3; i = i + 1)
{
    for( j = 1; j <= 3; j = j + 1)
    {
        System.out.println(i+"*"+j+"="+i*j);
    }
}
```



1



1

$$1 * 1 = 1$$

2

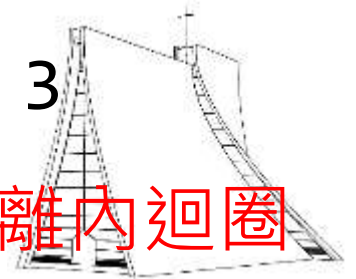
$$1 * 2 = 2$$

3

$$1 * 3 = 3$$

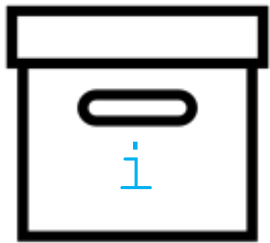
4

條件不符，跳離內迴圈

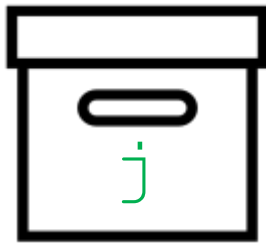




```
for( i = 12; i <= 3; i = i + 1)
{
    for( j = 1; j <= 3; j = j + 1)
    {
        System.out.println(i+"*"+j+"="+i*j);
    }
}
```



2



1

$$2 * 1 = 2$$

2

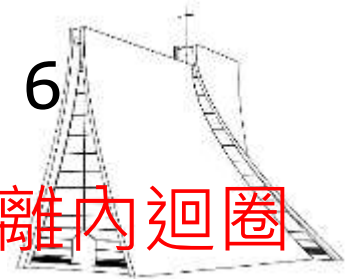
$$2 * 2 = 4$$

3

$$2 * 3 = 6$$

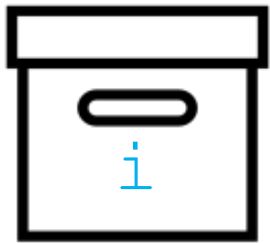
4

條件不符，跳離內迴圈

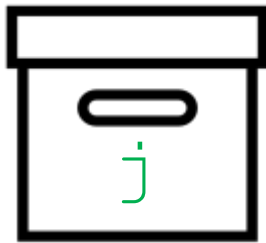




```
for ( i = 13; i <= 3; i = i + 1)
{
    for ( j = 1; j <= 3; j = j + 1)
    {
        System.out.println(i+"*"+j+"="+i*j);
    }
}
```



3



1

$$3 * 1 = 3$$

2

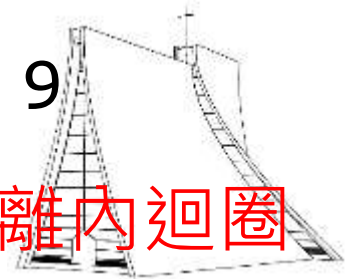
$$3 * 2 = 6$$

3

$$3 * 3 = 9$$

4

條件不符，跳離內迴圈





# 隨堂演練

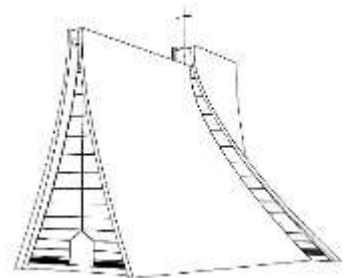
---

1. 修改課堂範例，完成九九乘法表！
2. 輸入一數字N，列出小於等於此數字N的所有質數？  
例如：

**請輸入一數字：**

你所輸入的數字為 13，小於等於13的質數有：

2, 3, 5, 7, 11, 13。



Thank You!