

# 實作輔導 4

- 日期: 4/21 (星期六) 13:10~16:00
- 地點: 臺北市立大學 臺北市中正區愛國西路一號 (中正紀念堂站7號出口)
- 公誠樓三樓 G316 電腦教室([資訊科學系](#))
- 可自行攜帶筆電
- 目標: 協助習題、安裝java 環境、path設定
- 參加者: 請email [給laiahfur@gmail.com](mailto:laiahfur@gmail.com) 或直接到輔導地點
- 下次預定:

搶答!!

Q1 : 印出結果?

```
int n = 7, i=0;
```

```
while (i<n) {
```

```
    System.out.print(i);
```

```
    i++;}
```

```
System.out.println(", i="+i);
```

## Q2 : 印出結果?

```
n = 7; i=0;//已宣告
```

```
while (i<n) {
```

```
    i++;
```

```
    System.out.print(i);
```

```
}
```

```
System.out.println(" ,i="+i);
```

## Q3 : 印出結果?

```
n = 7; i=0;
```

```
while (i<n) {
```

```
    n--;
```

```
    System.out.print(i);
```

```
}
```

```
System.out.println(" ,i="+i);
```

## Q4 : 印出結果?

```
int a, b;  
a=b=11;  
i=0;  
while (a>=b) {  
    ++i;  
    a--;  
}//while  
System.out.println("i="+i+" a="+a);
```

Q5 : 印出結果?

```
a=b=13;
```

```
i=0;
```

```
while (a>5 && a<9) {
```

```
    ++i;
```

```
    a--;
```

```
}//while
```

```
System.out.println("i="+i+" a="+a);
```

## Q6 :Debug

```
import java.util.Scanner;
public class scorerank_error {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int score = 0;
        while (score>=0) {
            System.out.print("輸入分數(整數):");
            score = input.nextInt();
            if (score >= 0) {
                //將分數除10，由於是int除int，所以結果仍為int(10~0)。
                switch (score / 10) {
                    //由於100~90都為(10~9)優等，因此兩case印出相同
                    case 10:
                    case 9:
                        System.out.print("等第：優\n");
                    case 8:
                        System.out.print("等第：甲\n");
                    case 7:
                        System.out.print("等第：乙\n");
                    case 6:
                        System.out.print("等第：丙\n");
                    case 5:
                        System.out.print("等第：丁\n");
                    case 4:
                        System.out.print("等第：戊\n");
                    case 3:
                        System.out.print("等第：己\n");
                    case 2:
                        System.out.print("等第：庚\n");
                    case 1:
                        System.out.print("等第：辛\n");
                    case 0: //由於9~0除10結果均為0，但9~1 & 0屬不同
                        if (score != 0)
                            System.out.print("等第：壬\n");
                        else
                            System.out.print("等第：癸\n");
                    default: //>100
                        System.out.print("無法判讀\n");
                } //switch
            } //if
            else {
                System.out.print("bye\n");
                break;
            } //switch
        } //while
    } //main
} //class
```

- Bug在何處? Syntax error?

- 請回答!!

- How to handle?

- Let's compile & run



# 自我練習

```
• public class challenge {  
    public static void main(String[] args) {  
        int n = 7, i=0;  
        while (i<n) {  
            System.out.print(i);  
            i++;}  
        System.out.println(", i="+i);  
        n = 7; i=0;//已宣告  
        while (i<n) {  
            i++;  
            System.out.print(i);  
        }  
        System.out.println(" ,i="+i);  
        n = 7; i=0;  
        while (i<n) {  
            n--;  
            System.out.print(i);  
        }  
        System.out.println(" ,i="+i);  
    }  
}
```

```
0123456, i=7  
1234567 ,i=7  
0000000 ,i=0  
i=1 a=10  
i=0 a=13
```

```
int a, b;  
    a=b=11;  
    i=0;  
    while (a>=b) {  
        ++i;  
        a--;  
    }//while  
    System.out.println("i="+i+" a="+a);  
    a=b=13;  
    i=0;  
    while (a>5 && a<9) {  
        ++i;  
        a--;  
    }//while  
    System.out.println("i="+i+" a="+a);  
}//main  
}//class
```

# 迴圈： for, do...while

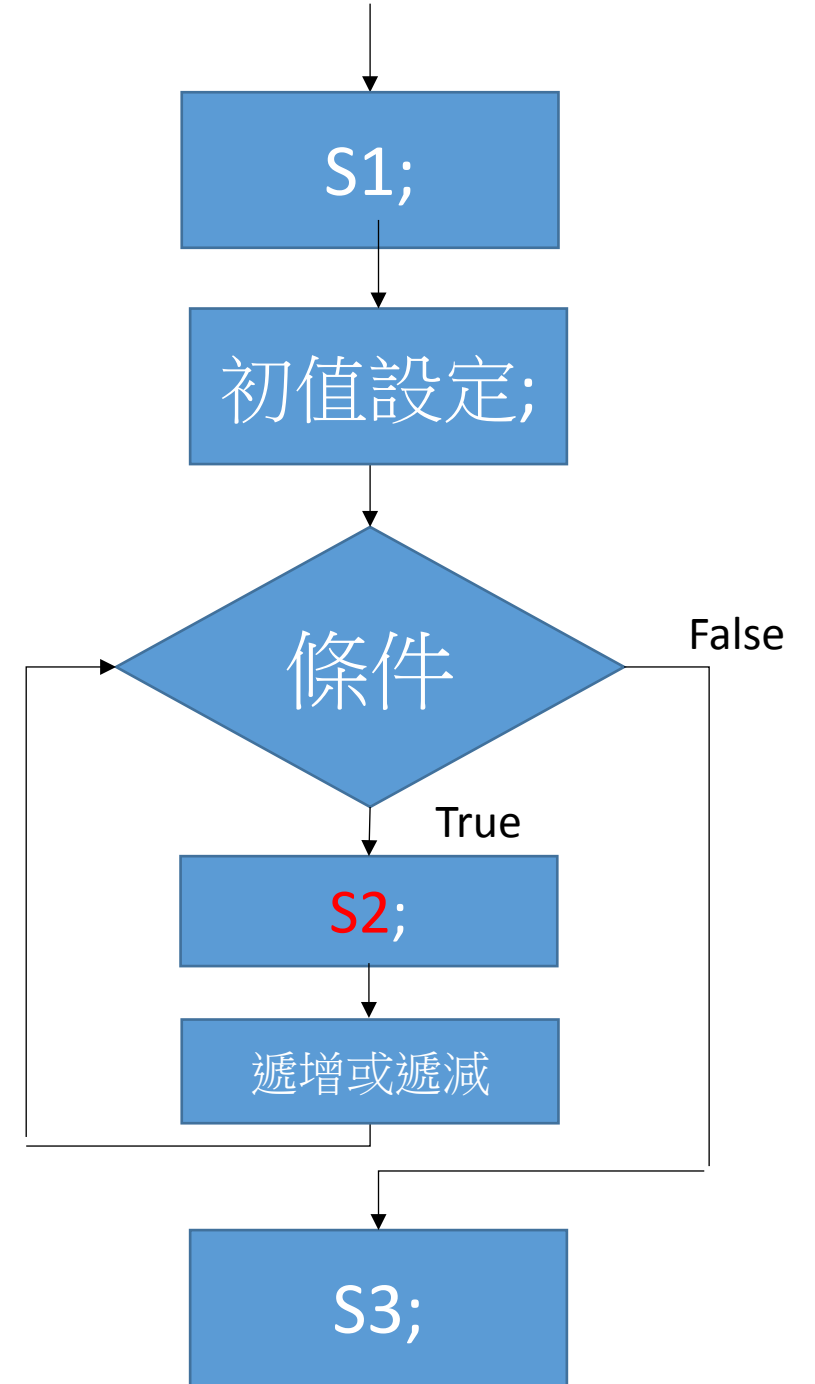
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賴阿福

# for迴圈

```
S1;  
For(初值設定;條件;遞增或遞減)  
{  
  s2;  
}  
S3;
```

For loop **body**

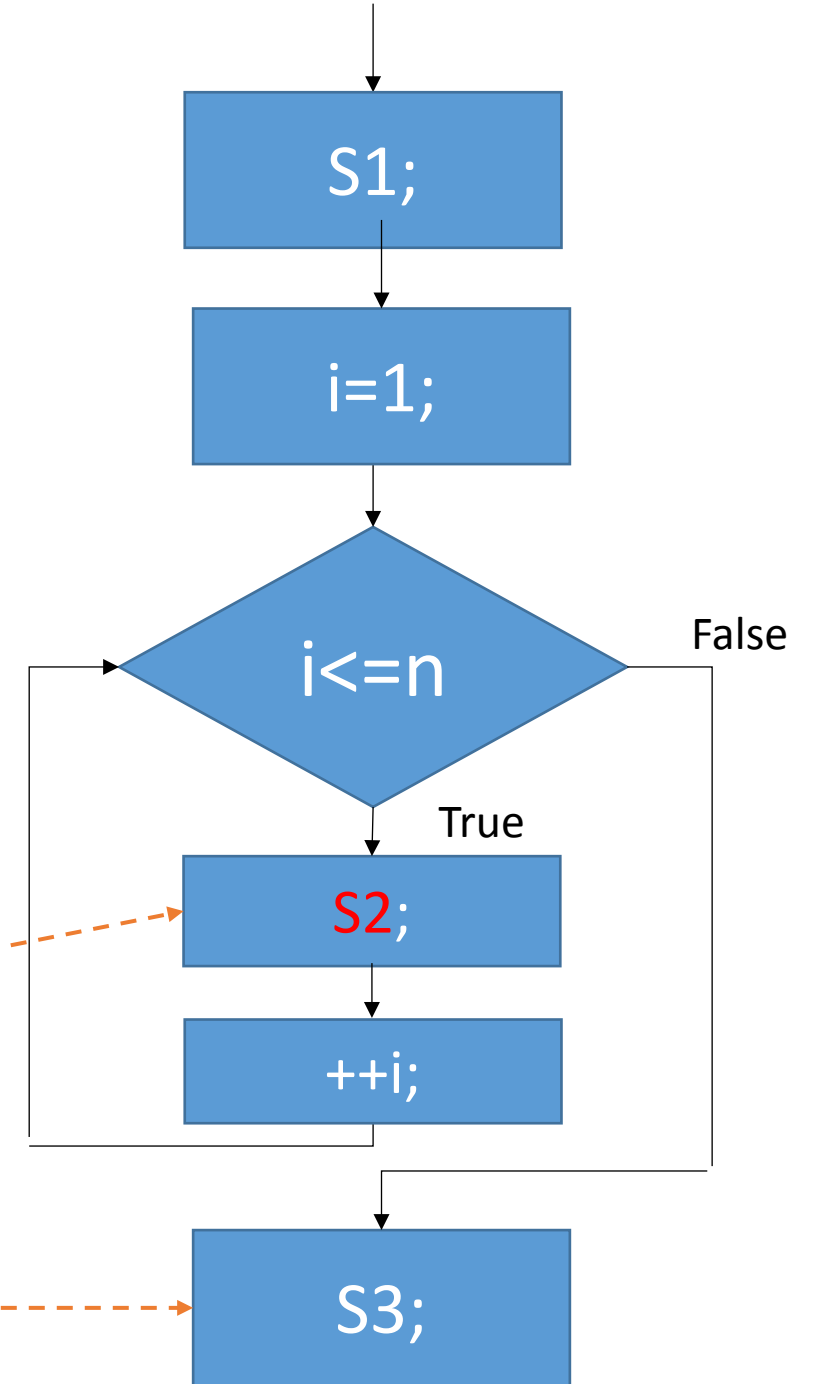


# for迴圈

```
S1;  
For(初值設定;條件;遞增或遞減)  
{  
  s2;  
}  
S3;
```

For loop **body**

```
n = input.nextInt();  
for(i=1;i<=n;++i) {  
  System.out.println("i="+i);  
}  
System.out.println("i="+i);
```



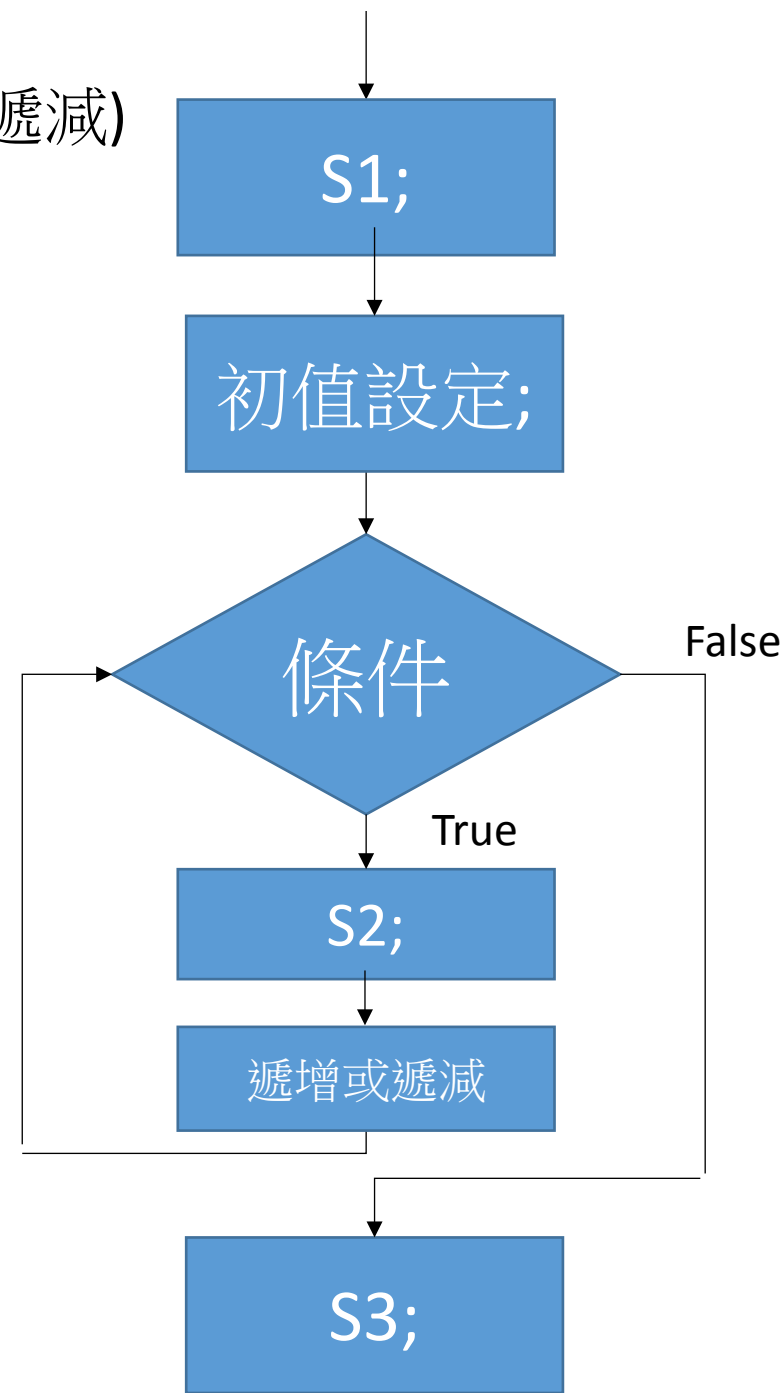
# for迴圈:印1~n

```
n = input.nextInt();  
for(i=1;i<=n;++i) {  
    System.out.println("i="+i);  
}  
System.out.println("i="+i);  
//印出多少??
```

```
n = input.nextInt();  
i=1;  
for(;i<=n;) {  
    System.out.println("i="+i);  
    ++i; //i=i+1;  
}  
System.out.println("i="+i); //印出多少??
```

```
S1;  
for(初值設定;條件;遞增或遞減)  
{  
    s2;  
    s3;  
}  
S4;
```

← 不同形式

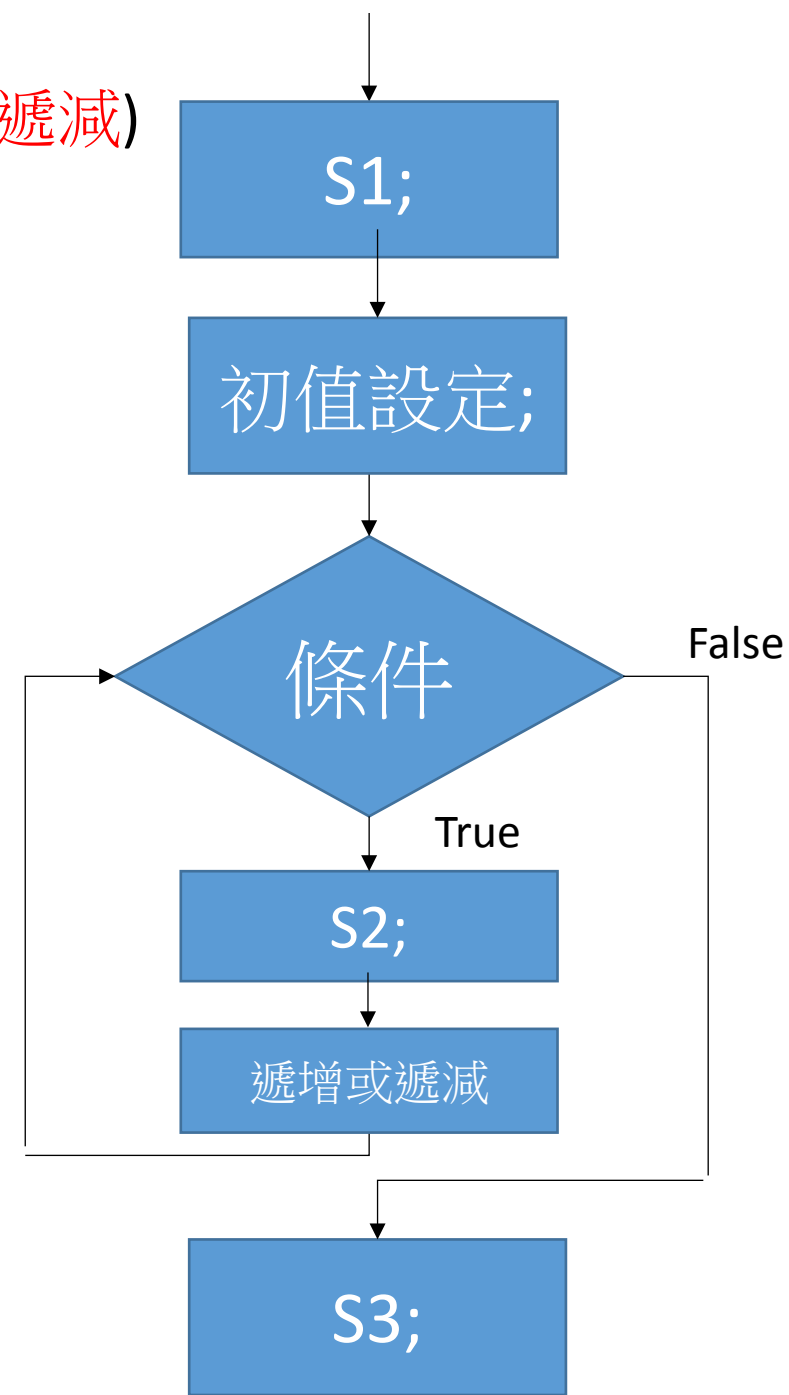


# for迴圈:印n~1

```
n = input.nextInt();  
for(i=n;i>=1;--i) {  
    System.out.println("i="+i);  
}  
System.out.println("i="+i);  
//印出多少??
```

```
n = input.nextInt();  
i=n;  
for(;i>=1;) {  
    System.out.println("i="+i);  
    --i; //i=i-1;  
}  
System.out.println("i="+i); //印出多少??
```

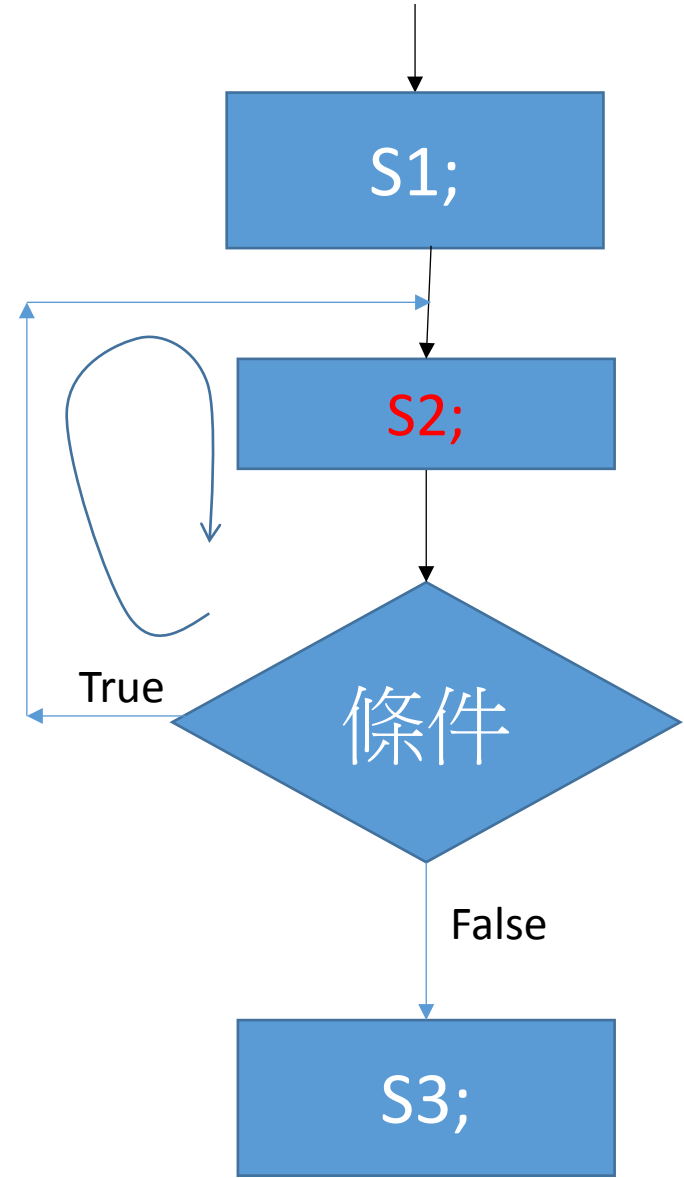
```
S1;  
For(初值設定;條件;遞增或遞減)  
{  
    s2;  
    s3;  
}  
S4;
```



# Do.. While ();迴圈

```
S1;  
do {  
    s2;  
} while (條件);  
S3;
```

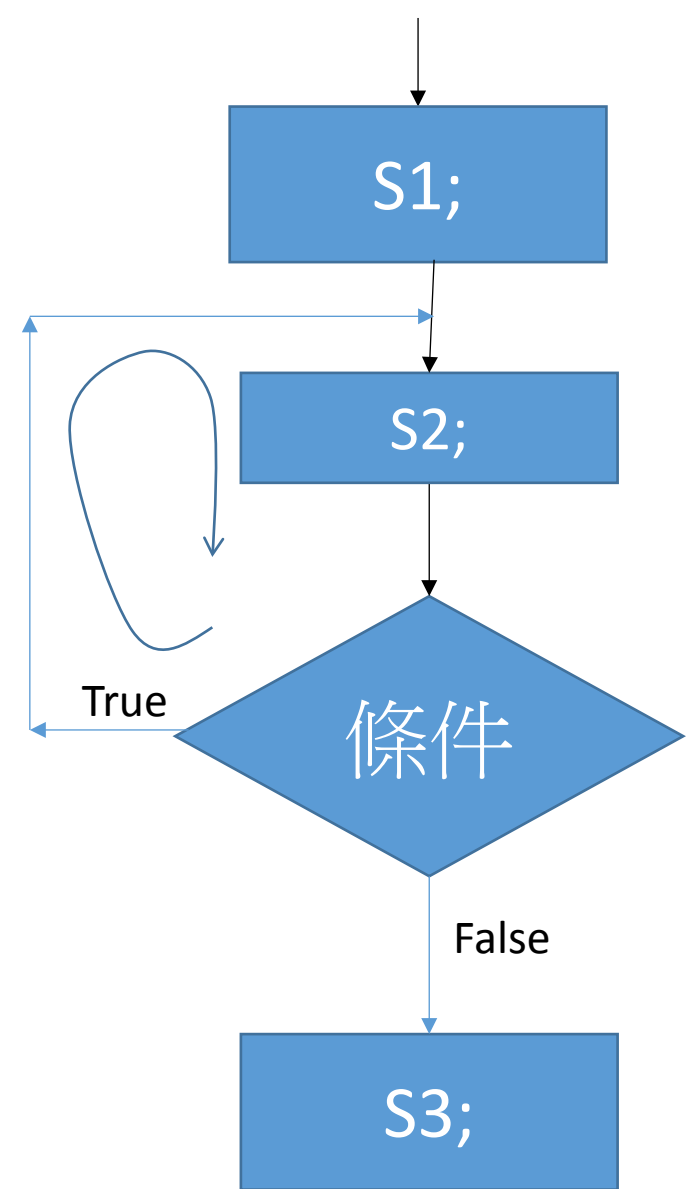
Do while loop **body**



# Do.. While ();迴圈 印1~10

```
S1;  
do {  
    s2;  
} while (條件);  
S3;
```

```
i=1;  
do {  
    System.out.println("i="+i);  
    i++;  
} while (i<=10) ;  
System.out.println("i="+i); //印出多少??
```

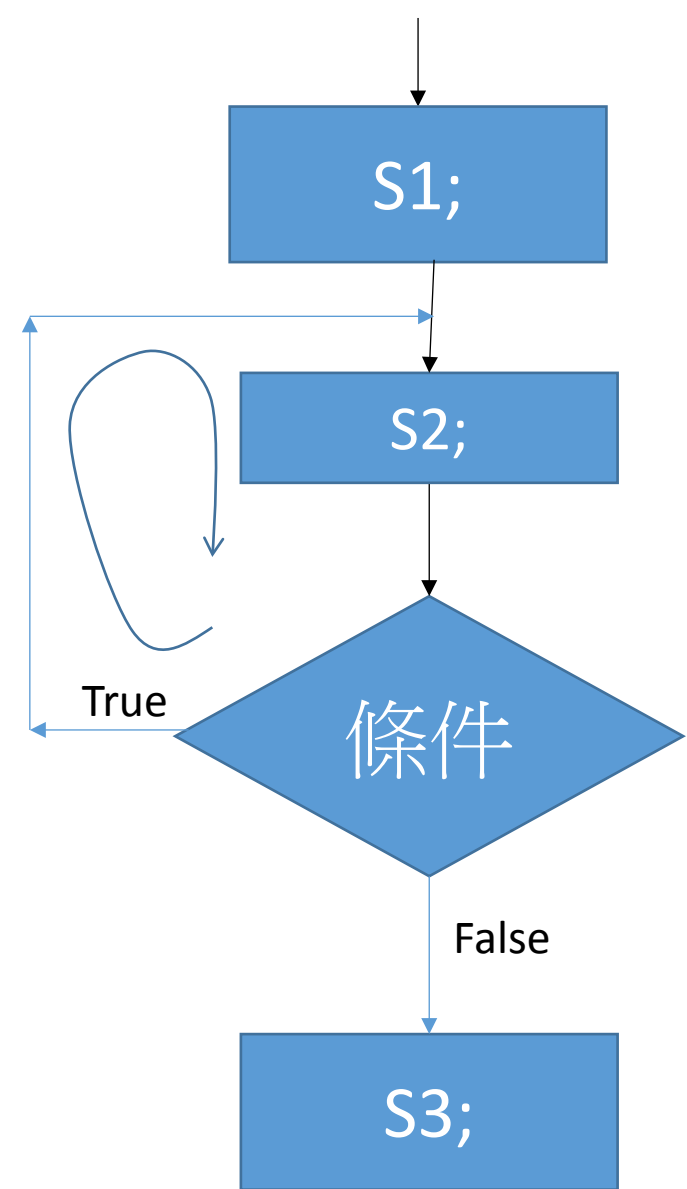




# Do.. While ();迴圈 印1~n

```
S1;  
do {  
    s2;  
} while (條件);  
S3;
```

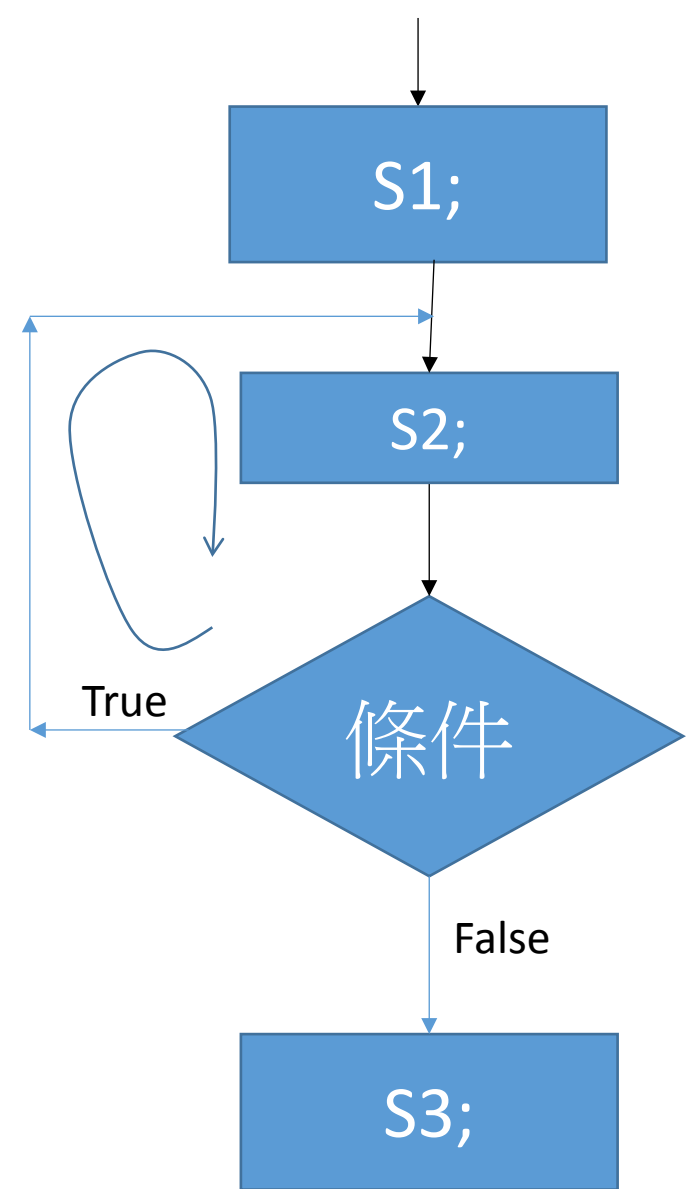
```
n = input.nextInt();  
i=1;  
do {  
    System.out.println("i="+i);  
    i++;  
} while (i<=n) ;  
System.out.println("i="+i); //印出多少??
```



# Do.. While ();迴圈 印1~10

```
S1;  
do {  
    s2;  
} while (條件);  
S3;
```

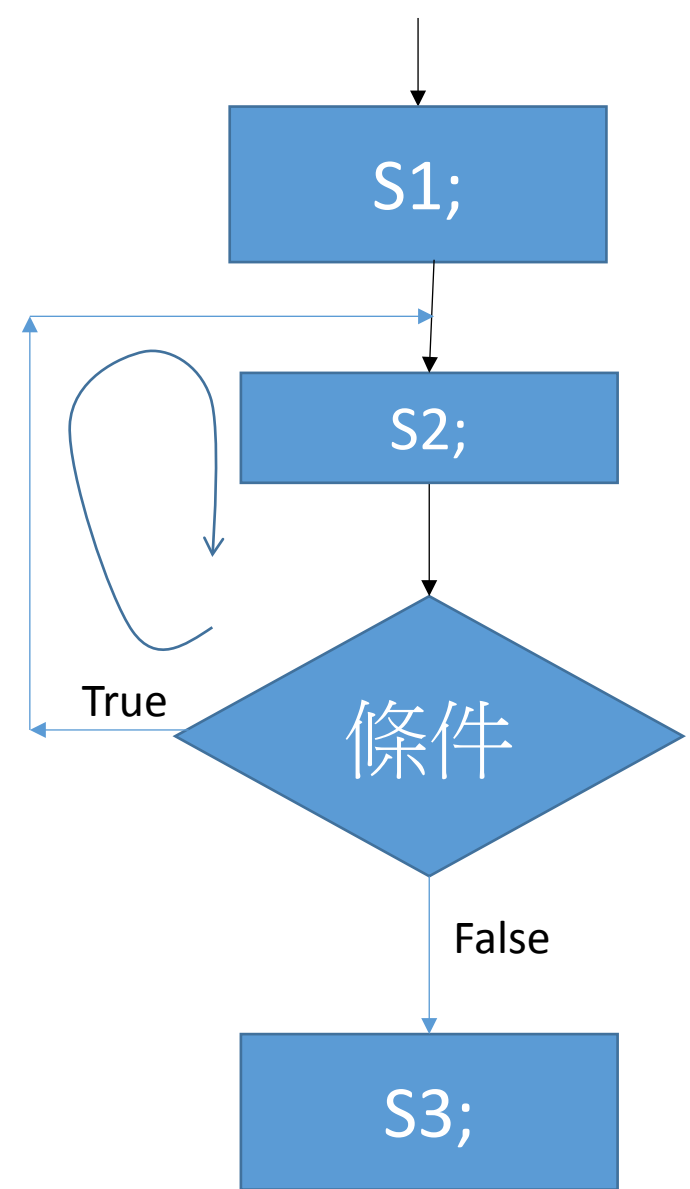
```
i=0;  
do {  
    i++;  
    System.out.println("i="+i);  
} while (i<10) ;  
System.out.println("i="+i); //印出多少??
```



# Do.. While ();迴圈 印1~n

```
S1;  
do {  
    s2;  
} while (條件);  
S3;
```

```
n = input.nextInt();  
i=0;  
do {  
    i++;  
    System.out.println("i="+i);  
} while (i<n);  
System.out.println("i="+i); //印出多少??
```



# 比較三種迴圈

- Trace all\_loop\_0.java
  - 印1~n

運用三種迴圈解  $S=1+2+\dots+n$

# For迴圈與while迴圈對等: $S=1+2+\dots+n$

```
n = input.nextInt();  
s = 0;  
For(i=1;i<=n; i++ )  
    s=s+i;  
System.out.println("1+2+...+"+n+"="+s);
```

```
n = input.nextInt();  
s=0; i=0;  
while (i<=n) {  
    s=s+i;  
    i++;}  
System.out.println("1+2+...+"+n+"="+s);
```

```
n = input.nextInt();  
s = 0; i=1;  
for(;i<=n;) {  
    s=s+i; i++; }  
System.out.println("1+2+...+"+n+"="+s);
```

完成對等  
equivalence

# For迴圈之不同形式

```
n = input.nextInt();  
s = 0;  
For(i=1; i<=n; i++) // ++i  
    s = s + i;  
System.out.println("1+2+...+" + n + "=" + s);
```

```
n = input.nextInt();  
s = 0; i = 1;  
for(; i <= n; s = s + i, i++)  
    ;  
System.out.println("1+2+...+" + n + "=" + s  
);
```

```
n = input.nextInt();  
s = 0; i = 1;  
for(; i <= n;) {  
    s = s + i; i++;  
}  
System.out.println("1+2+...+" + n + "=" + s);
```

```
n = input.nextInt();  
s = 0; i = 1;  
for(; i <= n; s = s + i++)  
    ;  
System.out.println("1+2+...+" + n + "=" + s  
);
```

# 遞增或遞減

```
i=i+1;
```

```
++i;
```

```
i++;
```

```
i+=1;
```

```
s=s+i++;
```

```
s=s+(++i);
```

```
i=i-1;
```

```
--i;
```

```
i--;
```

```
i-=1;
```

```
s=s+i--;
```

```
s=s+(--i);
```

完成對等??



# 比較遞增:

```
i=1;  
s=10;  
s=s+i++;  
System.out.println(s);  
System.out.println(i);
```

```
s=s+i;  
i=i+1;
```

11

2

```
i=1;  
s=10;  
s=s(++i);  
System.out.println(s);  
System.out.println(i);
```

```
i=i+1;  
s=s+i;
```

12

2

# 比較遞減

```
i=1;  
s=10;  
s=s+i--;  
System.out.println(s);
```



搶答

```
i=1;  
s=10;  
s=s+(--i);  
System.out.println(s);
```



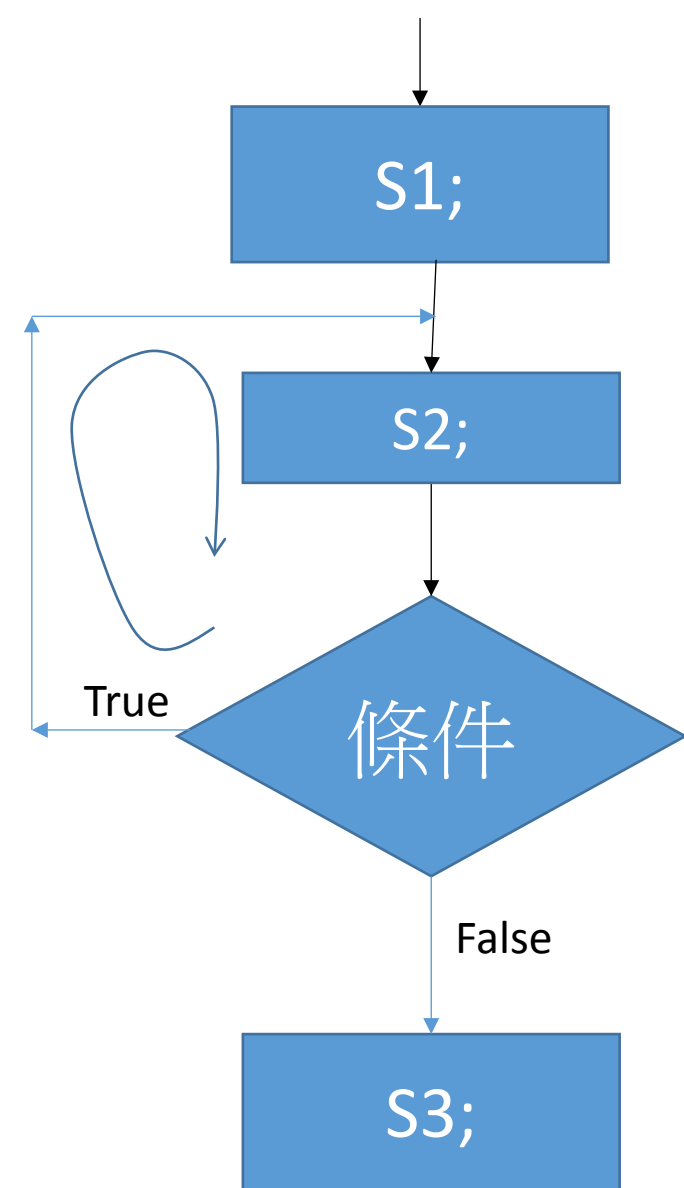
搶答

Do.. While ();迴圈

$S=1+2+\dots+n$

```
S1;  
do {  
    s2;  
} while (條件);  
S3;
```

```
n = input.nextInt();  
i=1;  
s=0;  
do {  
    s=s+i;  
    i++;  
}while (i<=n);  
System.out.println("1+2+...+"+n+"="+s);
```



# Debug :輸入奇數n,求 $S=1+3+5+\dots+n$

```
1.import java.util.Scanner;
2.public class loop_debug_1 {
3. public static void main(String[] args) {
4. Scanner input = new Scanner(System.in);
5. int n=7,i=0, s=0;
6. System.out.println("輸入奇數n,求S=1+3+5+.....+n\n");
7. while (n>=1) {
8. System.out.print("輸入奇數(-1:end) : ");
9. n = input.nextInt();
10. for(i=1;i<=n;++i)
11. s=s+i;
12. System.out.println("1+3+5+...+"+n+"="+s);
13. }//while
14.
15. }//main
16.}//class
```

**搶答：**  
**那些錯誤?如何修?**  
**寫出編號及修改結果**

# Debug :輸入奇數n,求 $S=1+3+5+\dots+n$

```
1.import java.util.Scanner;
2.public class loop_debug_1 {
3. public static void main(String[] args) {
4. Scanner input = new Scanner(System.in);
5. int n=7,i=0, s=0;
6. System.out.println("輸入奇數n,求S=1+3+5+.....+n\n");
7. while (n>=1) {
8. System.out.print("輸入奇數(-1:end) : ");
9. n = input.nextInt();
10. if (n%2==0) {
11. System.out.println("輸入錯誤，須為奇數!");
12. continue;}
13. for(i=1;i<=n;++i)
14. s=s+i;
15. System.out.println("1+3+5+..."+n+"="+s);
16. }//while
17.
18. }//main
19.}//class
```

處理輸入錯誤

# 追蹤for loop

```
int n=7;
```

```
for(i=1;i<=n;++i) {
```

```
    s=s+i;
```

```
    ++i; }
```

```
System.out.println("s"="+s);
```



搶答:

Debug :輸入整數n,求 $S=1*2*3*.....*n$

```
1. import java.util.Scanner;
2. public class all_loop_1 {
3.     public static void main(String[] args) {
4.         Scanner input = new Scanner(System.in);
5.         int n=7,i=0;
6.         int s=0;
7.         System.out.println("輸入整數n,求 $S=1*2*3*.....*n$ \n");
8.         while (n>=1) {
9.             System.out.print("輸入整數(-1:end) : ");
10.            n = input.nextInt();
11.            for(i=1;i<=n;++i)
12.                s=s*i;
13.            System.out.println("1*2*3*...*"+n+"="+s);
14.        }//while
15.    }//main
16. }//class
```

**搶答：**  
**那些錯誤?如何修?**  
**寫出編號及修改結果**

# 第9周習題: 共二題(全部要完成)

- 9-1: 三種迴圈解 $s=1*2+3*4+\dots+n*(n+1)$ 
  - 輸入 $n$ (奇數), 求 $s=1*2+3*4+5*6+\dots+n*(n+1)$ 
    - 輸入錯誤(如4), 要求重新輸入
    - 輸入 $n$ 後, 分別以while, do..while, for 等三種迴圈求 $s$
    - 放置於同一.java
    - 使用者可重複輸入, 直到輸入 $\leq 0$ 或回答N, 才結束程式
  - 繳交"設計歷程"檔及.java
- 9-2: 三種迴圈解 $s=1*2+2*3+\dots+n*(n+1)$ 
  - 輸入 $n$ , 求 $s=1*2+2*3+3*4+\dots+n*(n+1)$ 
    - 輸入 $n$ 後, 分別以while, do..while, for 等三種迴圈求 $s$
    - 放置於同一.java
    - 使用者可重複輸入, 直到輸入 $\leq 0$ 或回答N, 才結束程式
  - 繳交"設計歷程"檔及.java



Review

switch case

# 改為5等第

```
import java.util.Scanner;
public class scorerank_2a {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int score = 0;
        while (score >= 0) {
            System.out.print("輸入分數(整數>=0) : ");
            score = input.nextInt();
            if (score < 0) break;
            //100~90優 89~80甲 79~70乙 69~60丙 59~0丁
            switch (score / 10) {
                case 10:
                case 9:
                    System.out.print("等第 : 優\n");
                    break; //結束執行, break switch判斷;
                case 8:
                    System.out.print("等第 : 甲\n");
                    break;
                case 7:
                    System.out.print("等第 : 乙\n");
                    break;
                case 6:
                    System.out.print("等第 : 丙\n");
                    break;
                case 5:
                case 4:
                case 3:
                case 2:
                case 1:
                case 0:
                    System.out.print("等第 : 丁\n");
                    break;
                default:
                    System.out.print("無法判讀\n");
                    break;
            } //switch
        } //while
    } //main
} //class
```

# 改變運算式

- $(score-50)/10$

```
import java.util.Scanner;
public class scorerank_2b {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int score = 0;
        while (score >= 0) {
            System.out.print("輸入分數(整數>=0) : ");
            score = input.nextInt();
            if (score < 0)
                {System.out.print("Bye\n");break;}
            //100~90優 89~80甲 79~70乙 69~60丙 59~0丁
            if (score <= 100 && score >= 0) {
                switch ((score-50)/10) {
                    case 5:
                    case 4:
                        System.out.print("等第 : 優\n");
                        break; //結束執行, break switch 判斷;
                    case 3:
                        System.out.print("等第 : 甲\n");
                        break;
                    case 2:
                        System.out.print("等第 : 乙\n");
                        break;
                    case 1:
                        System.out.print("等第 : 丙\n");
                        break;
                    case 0:
                    default:
                        System.out.print("等第 : 丁\n");
                        break;
                } //switch
            }
            else
                System.out.print("超過範圍\n");
        } //while
    } //main
} //class
```

# 主題：字元金字塔 - 斜金字塔

- 利用迴圈印出「\*」，逐行增加印出個數，直到印出7層斜金字塔。
- 本題利用到巢狀迴圈的概念
- 巢狀迴圈為迴圈範圍內又有迴圈，從外層迴圈內層迴圈開始連層屬外層迴圈，與外層迴圈作用結束後，又回到外層迴圈。

```
public class Charstar1 {
    public static void main(String[] args) {
        //變數level為金字塔的層數
        int level = 7;

        //for迴圈 直到印完 level行結束金字塔
        //外圍迴圈i為當下的層數，i增加即為換層
        for (int i = 1; i <= level; i++) {
            //第i列時，印出i個*
            //j為當下的星星個數，每列都從1個開始印
            for (int j = 1; j <= i; j++)
                System.out.print("*");

            //每層結束換行
            System.out.println("");
        }
    }
}
```

執行結果

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