迴圈

while loop

Ya-Chun Hsu @ Taipei Municipal Jianguo High School
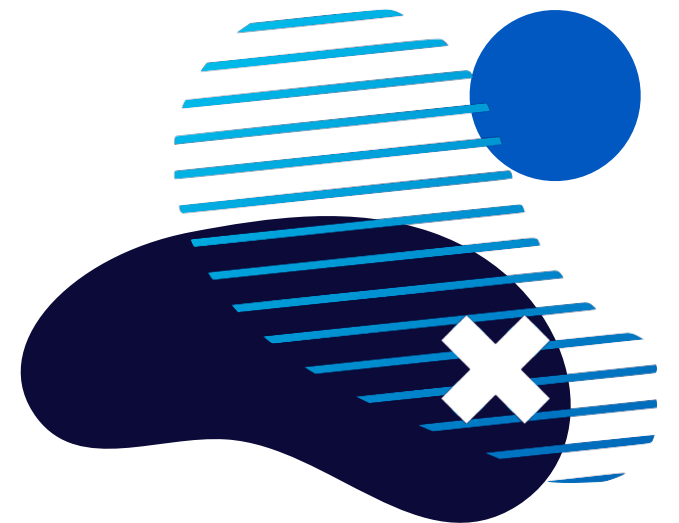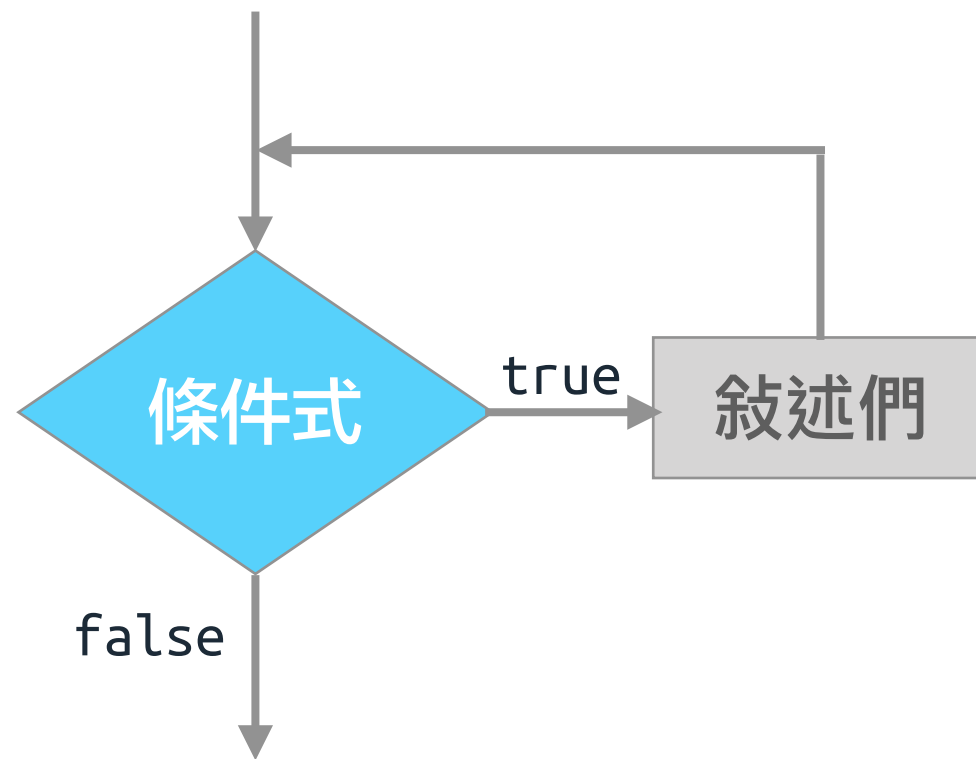
while迴圈

while(條件式)
    敘述;

─── **or** ───

while(條件式){
    敘述1;
    敘述2;
    …
}

檢查密碼

```cpp
1  #include <iostream>
2  using namespace std;
3
4  int main(){
5      int correct_password=101;
6      int password=0;
7      cout<<"Please input the password..."<<endl;
8      cin>>password;
9      while(password!=correct_password){
10         cout<<"Wrong password! Input again..."<<endl;
11         cin>>password;
12     }
13     return 0;
14 }
```

Input & Output

```
Please input the password...
102
Wrong password! Input again...
103
Wrong password! Input again...
101
```
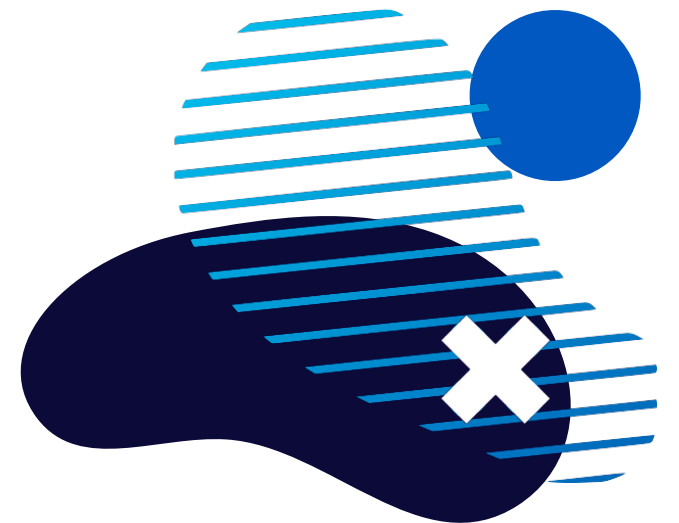
更多的運算子...

- 複合指定運算子

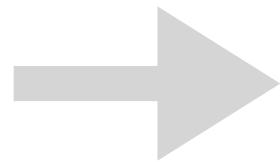 += , -= , *= , /= , %=

- 遞增遞減運算子

  ++ , --

複合指定運算子

```
a = a + b;          a += b;
a = a - b;          a -= b;
a = a * b;    →     a *= b;
a = a / b;          a /= b;
a = a % b;          a %= b;
```
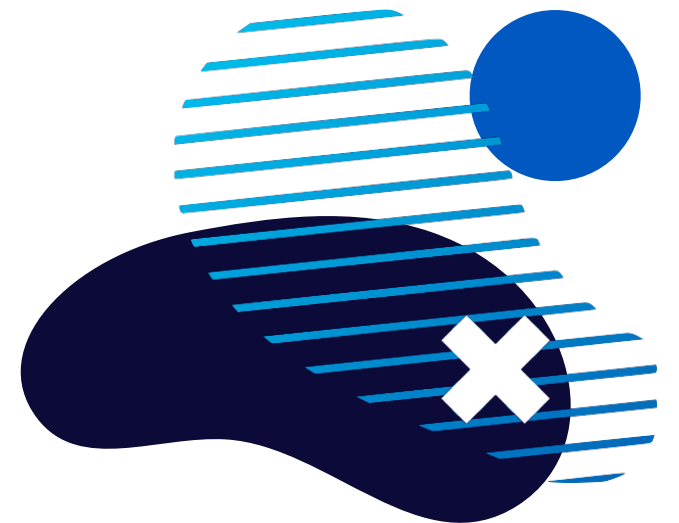
遞增遞減運算子

```
x = x + 1;        x += 1;        x++;
                                 ++x;
x = x - 1;        x -= 1;        x--;
                                 --x;
```

輸出結果？

```cpp
#include <iostream>
using namespace std;

int main(){
    int x=3;
    cout << x+1 << endl;
    cout << x << endl;
    return 0;
}
```

Output
4
3

輸出結果？
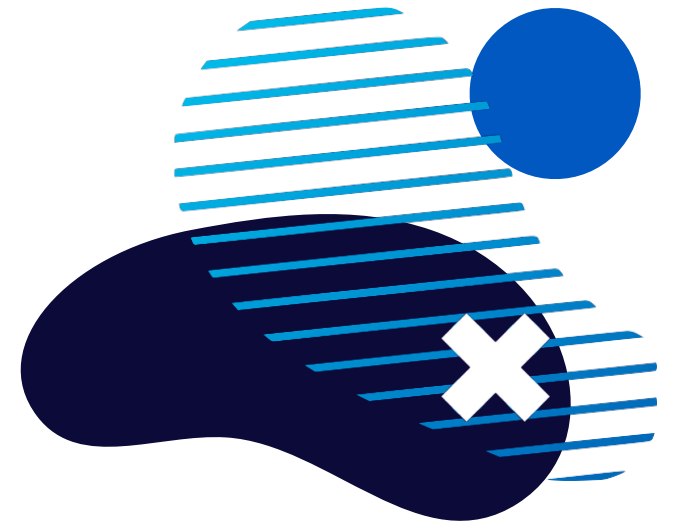
```
1 #include <iostream>
2 using namespace std;
3
4 int main(){
5     int x=3;
6     x=x+1;
7     cout<<x<<endl;
8     return 0;
9 }
```

Output

4

```
1 #include <iostream>
2 using namespace std;
3
4 int main(){
5     int x=3;
6     cout<<x=x+1<<endl;
7     return 0;
8 }
```

Compile error
編譯錯誤
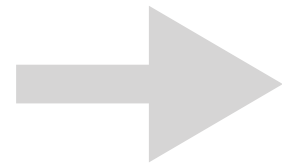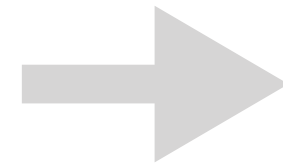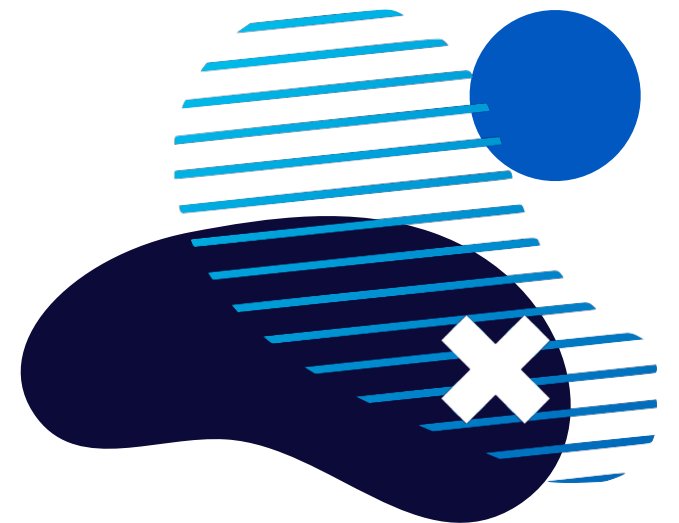
輸出結果？

```
1 #include <iostream>
2 using namespace std;
3
4 int main(){
5     int x=3;
6     cout<<x+=1<<endl;
7     return 0;
8 }
```

Compile error
編譯錯誤

```
1 #include <iostream>
2 using namespace std;
3
4 int main(){
5     int x=3;
6     cout<<x++<<endl;
7     return 0;
8 }
```

Output

3
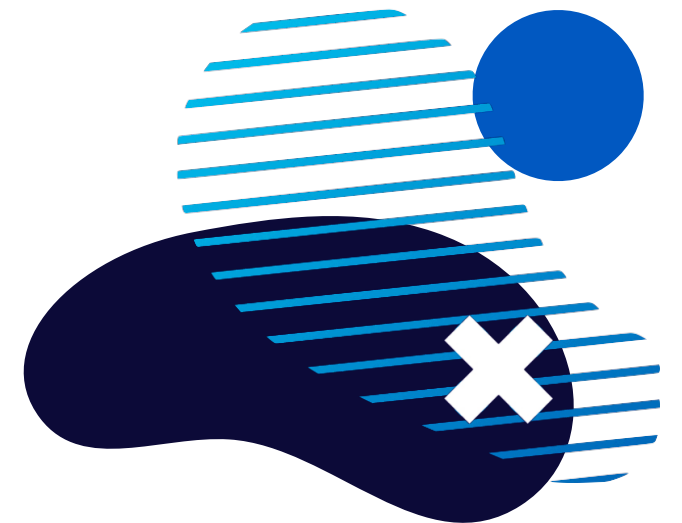
輸出結果？

```cpp
1 #include <iostream>
2 using namespace std;
3
4 int main(){
5     int x=3;
6     cout << x++ << endl;
7     cout << x << endl;
8     return 0;
9 }
```

Output
3
4
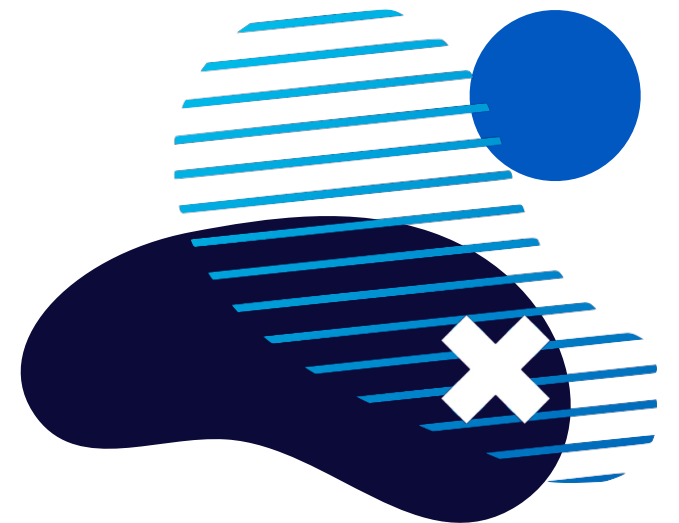
輸出結果？

```
1 #include <iostream>
2 using namespace std;
3
4 int main(){
5     int x=3;
6     cout << ++x << endl;
7     cout << x << endl;
8     return 0;
9 }
```
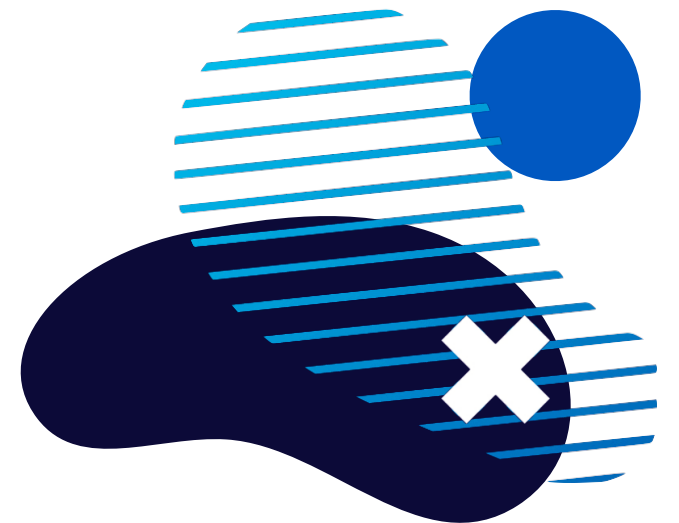
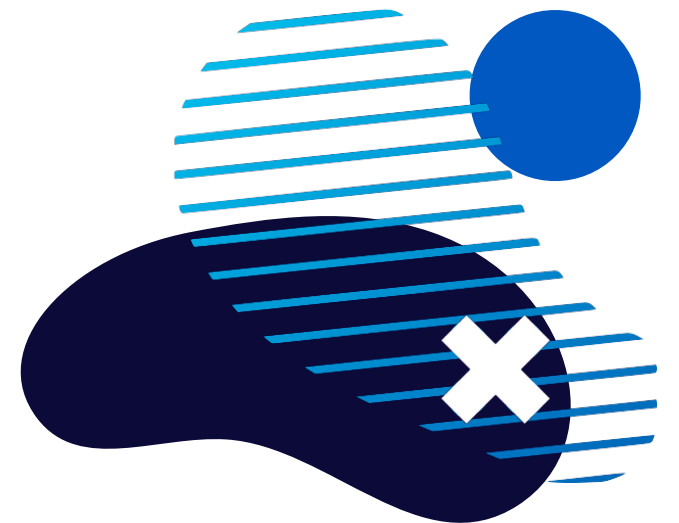| Output |
|--------|
| 4 |
| 4 |

輸出１ 2 3 4 5

```cpp
1  #include <iostream>
2  using namespace std;
3
4  int main(){
5      int num=1;
6      while(num<=5){
7          cout<<num<<" ";
8          num++;
9      }
10     return 0;
11 }
```

Output
1 2 3 4 5

num=6

Combo Hit!

```cpp
1  #include <iostream>
2  using namespace std;
3
4  int main(){
5      int num_hits=5;
6      while(num_hits>0){
7          cout<<num_hits<<" hits!"<<endl;
8          num_hits--;
9      }
10     return 0;
11 }
```

Output

```
5 hits!
4 hits!
3 hits!
2 hits!
1 hits!
```

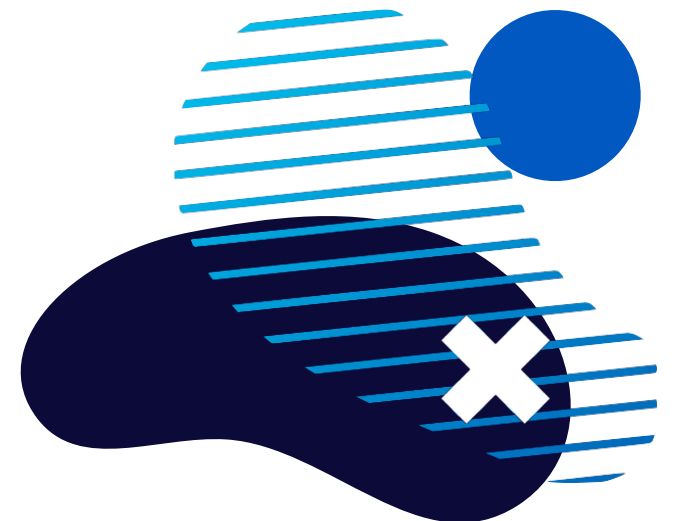英文老師在你背後，他非常火

Combo Hit!

```cpp
1  #include <iostream>
2  using namespace std;
3
4  int main(){
5      int num_hits=5;
6      while(num_hits>1){
7          cout<<num_hits<<" hits!"<<endl;
8          num_hits--;
9      }
10     cout<<num_hits<<" hit!"<<endl;
11     return 0;
12 }
```

Output

```
5 hits!
4 hits!
3 hits!
2 hits!
1 hit!
```
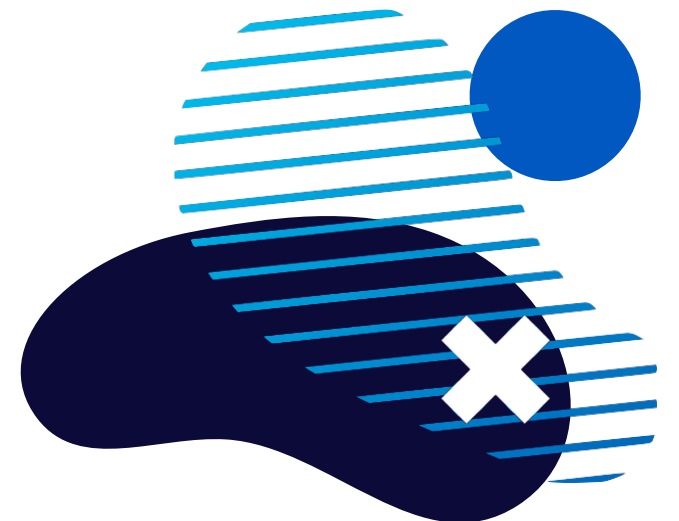
Combo Hit!

```cpp
1  #include <iostream>
2  using namespace std;
3
4  int main(){
5      int num_hits=5;
6      while(num_hits>0){
7          cout<<num_hits;
8          if(num_hits==1)
9              cout<<" hit!"<<endl;
10         else
11             cout<<" hits!"<<endl;
12         num_hits--;
13     }
14     return 0;
15 }
```

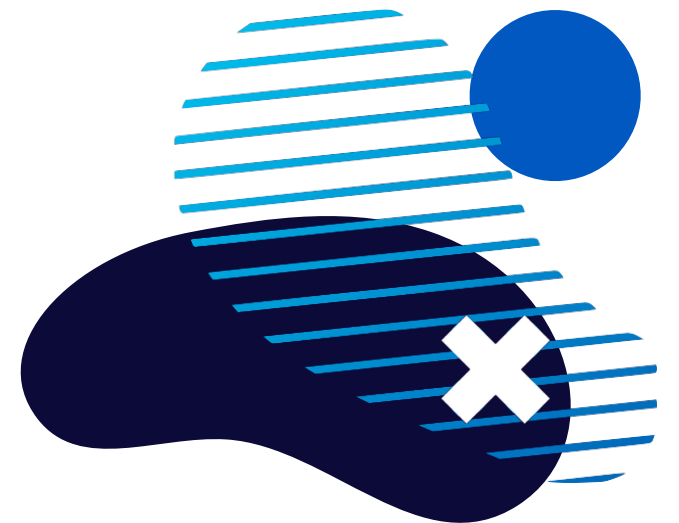| Output |
| --- |
| 5 hits! |
| 4 hits! |
| 3 hits! |
| 2 hits! |
| 1 hit! |

Be careful!

```cpp
#include <iostream>
using namespace std;

int main(){
    int num=5;
    while(num>0){
        cout<<"XD ";
    }
    return 0;
}
```
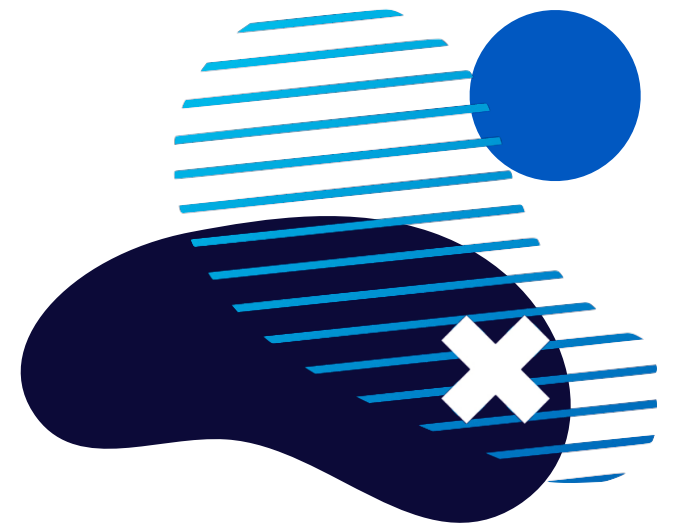
無窮迴圈

電腦笑你...

迴圈

do while loop

Ya-Chun Hsu @ Taipei Municipal Jianguo High School
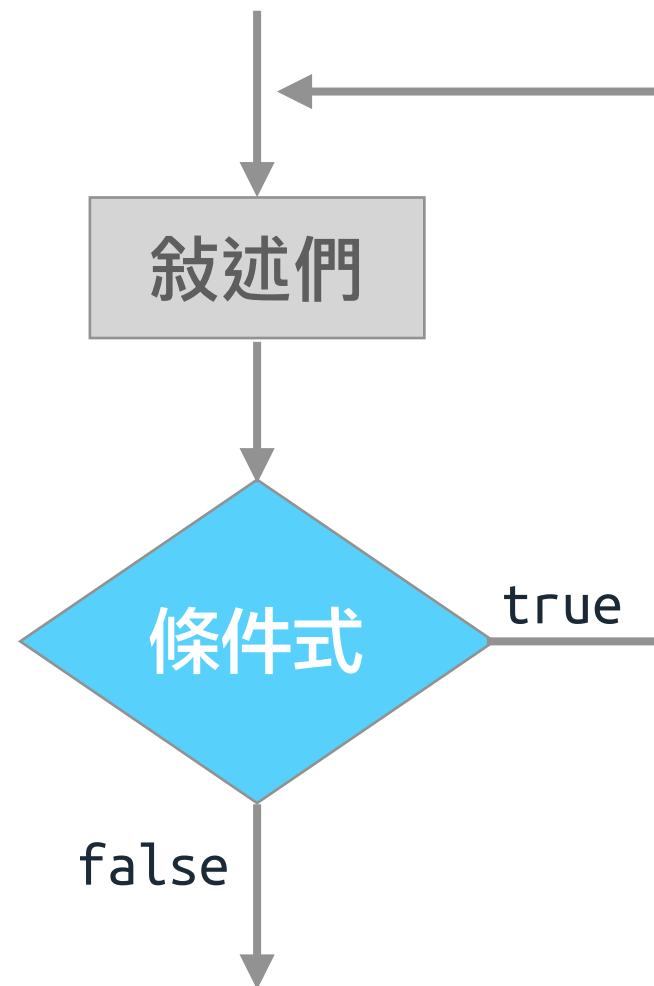
do...while迴圈

```
do{
    敘述1;
    敘述2;
    …
}while(條件式);
```

計算1+3+...+n

```cpp
1  #include <iostream>
2  using namespace std;
3
4  int main(){
5      int n,i=1,sum=0;
6      cin>>n;
7      do{
8          sum+=i;
9          i+=2;
10     }while(i<=n);
11     cout<<sum<<endl;
12     return 0;
13 }
```
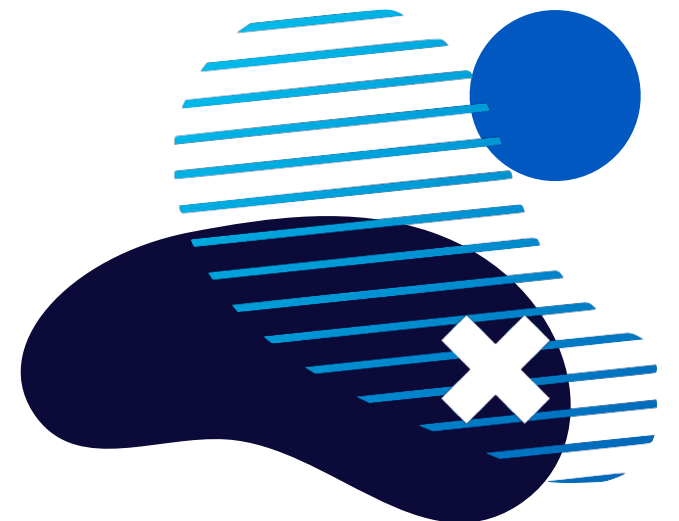
Input
9

Output
25

do...while vs while

```cpp
1  #include <iostream>
2  using namespace std;
3
4  int main(){
5      int n=0;
6      do{
7          cout<<"*";
8      }
9      while(n>0);
10     return 0;
11 }
```
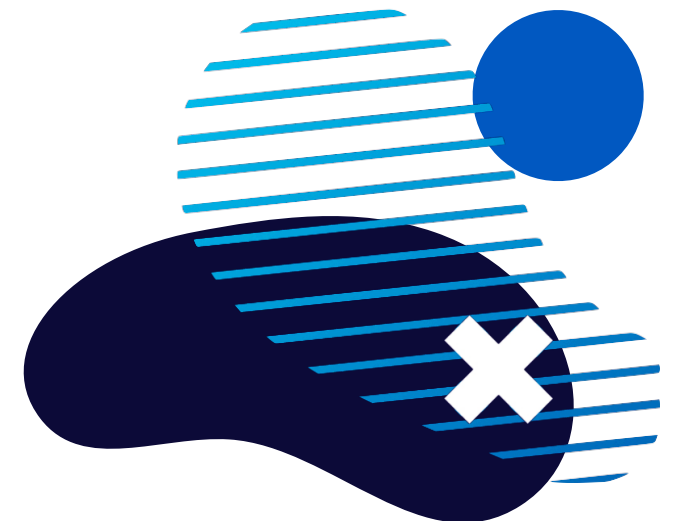
```cpp
1  #include <iostream>
2  using namespace std;
3
4  int main(){
5      int n=0;
6      while(n>0){
7          cout<<"*";
8      }
9      return 0;
10 }
```

Output

```
*
```

無論如何都至少執行一次

Output

do...while vs while

```cpp
#include <iostream>
using namespace std;

int main(){
    int n,i=1,sum=0;
    cin>>n;
    do{
        sum+=i;
        i+=2;
    }while(i<=n);
    cout<<sum<<endl;
    return 0;
}
```

```cpp
#include <iostream>
using namespace std;

int main(){
    int n=1,sum=0;
    while(n<=10){
        sum+=n;
        n++;
    }
    cout<<sum<<endl;
    return 0;
}
```

Output
55

Output
55