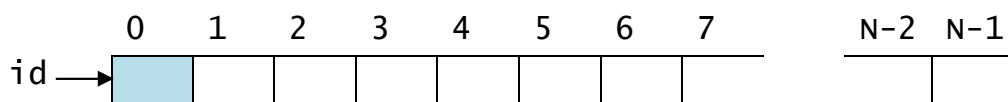


Ex. 1 使用陣列儲存輸入的數值。

資料結構

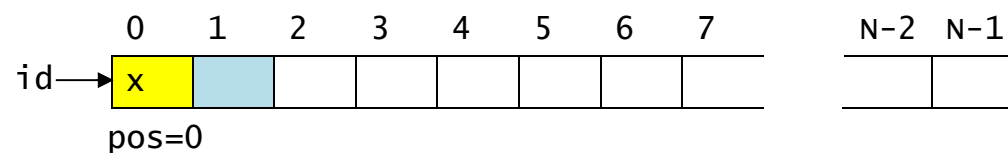
(初始)



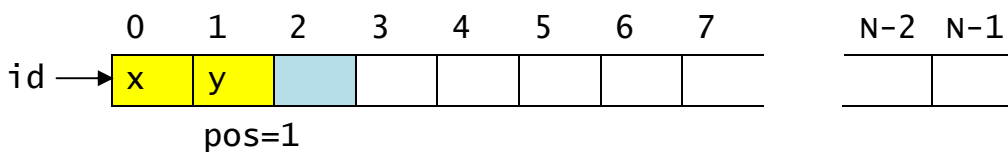
陣列最後元素索引位置  $pos$ ，可填入索引位置  $pos+1$

$pos = -1$  表示空陣列

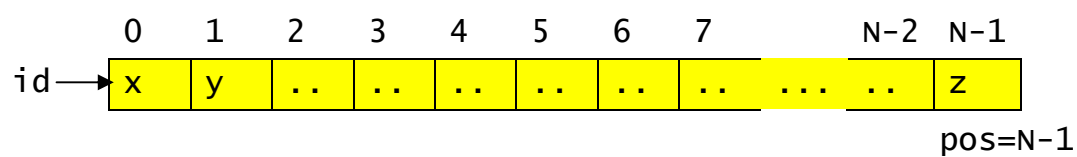
(新增數字 x)



(新增數字 y)



(陣列全滿的情況)



(程式碼)

```
ref class record {
public:
    int N;
    int *id;
    int pos;
    record(){ N=5; id=new int[N]; pos=-1; }
} A;

void show(){
    int k;
    textBox2->Text="";
    for(k=0; k<=A.pos; k++ )
        textBox2->Text+=A.id[k].ToString()+"\r\n";
}

private: System::Void button1_Click(System::Object^
                                     sender, System::EventArgs^ e) {
    if(A.pos<A.N-1) {
        int x;
        if( int::TryParse(textBox1->Text, x) ){
            ++A.pos;
            A.id[A.pos]=x;
            show();
        }
    }
}

private: System::Void button2_Click(System::Object^
                                     sender, System::EventArgs^ e) {
    A.pos=-1;
    show();
}
```

Ex. 2 使用陣列儲存輸入的數值與字串。

Form1

ID

Name

Add

Clear

資料結構

(初始)

	0	1	2	3	4	5	6	7		N-2	N-1
id →											
name →											

陣列最後元素索引位置  $pos$ ，可填入索引位置  $pos+1$

$pos = -1$  表示空陣列

(新增數字  $x$ ，字串 "Jim")

	0	1	2	3	4	5	6	7		N-2	N-1
id →	x										
name →	Jim										

$pos=0$

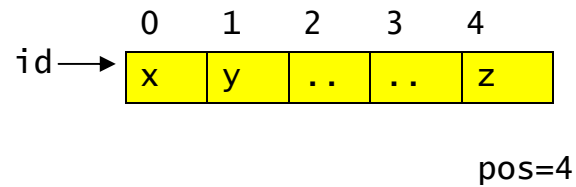
(程式碼)

```
ref class record {
public:
    int N;
    int *id;
    array<String^> ^name;
    int pos;
    record(){
        N=5;
        id=new int[N];
        name=gcnew array<String^>(N);
        pos=-1;
    }
} A;
void show(){
    int k;
    textBox3->Text="";
    for(k=0; k<=A.pos; k++ )
        textBox3->Text += A.id[k].ToString() + "["
                        + A.name[k] + "]\r\n";
}
private: System::Void button1_Click(System::Object^
    sender, System::EventArgs^ e) {
    if(A.pos<A.N-1) {
        int x;
        if( int::TryParse(textBox1->Text, x) ){
            ++A.pos;
            A.id[A.pos]=x;
            A.name[A.pos]=textBox2->Text;
            show();
        }
    }
}
private: System::Void button2_Click(System::Object^
    sender, System::EventArgs^ e) {
    A.pos=-1;
    show();
}
```

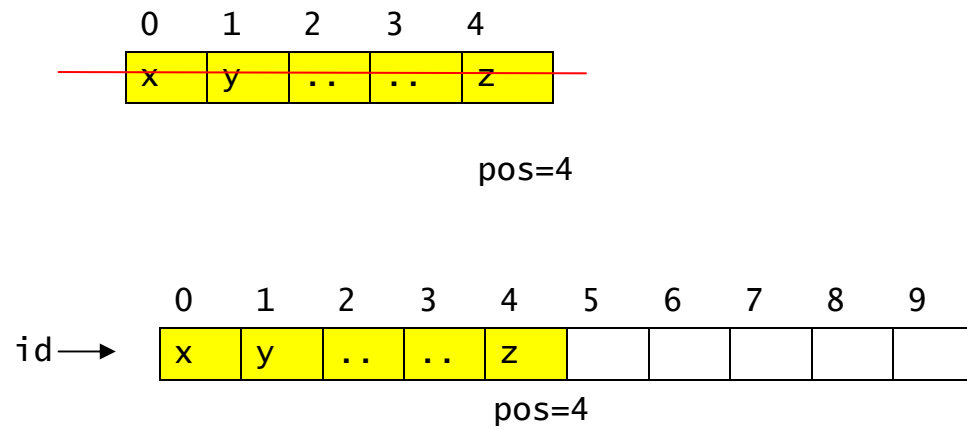
Ex. 3 同 Ex. 1 使用陣列儲存輸入的數值，並處理陣列長度不足的情況。

資料結構

(N=5 陣列全滿的情況)



產生兩倍長度陣列，複製舊陣列元素到新陣列，刪除舊陣列



(程式碼)

```
ref class record {
public:
    int N;
    int *id;
    int pos;
    record(){ N=5; id=new int[N]; pos=-1; }
} A;

void show(){
    int k;
    textBox2->Text="";
    for(k=0; k<=A.pos; k++ )
        textBox2->Text+=A.id[k].ToString()+"\r\n";
}

private: System::Void button1_Click(System::Object^
    sender, System::EventArgs^ e) {
    if(A.pos>=A.N-1) {
        A.N=2*A.N;
        int *new_id=new int[A.N];
        int k;
        for(k=0; k<A.N/2; k++) new_id[k]=A.id[k];
        delete A.id;
        A.id=new_id;
    }
    int x;
    if( int::TryParse(textBox1->Text, x) ){
        ++A.pos;
        A.id[A.pos]=x;
        show();
    }
}

private: System::Void button2_Click(System::Object^
    sender, System::EventArgs^ e) {
    A.pos=-1;
    show();
}
```