Nested For Loops

- Just as with Do While loops, we can nest one for loop inside another. This is very common when dealing with 2-dimensional arrays.
- For each iteration of the outer loop executes, we start the inner loop over again.

```vbnet
Dim i As Integer, j As Integer
For i = 1 To 3
    For j = 1 To 2
        Print i, j
    Next j
Next i
```

Result:

```
1  1  
1  2  
2  1  
2  2  
3  1  
3  2  
```

Visualizing Nested For Loops

- We can show this graphically by drawing a box around the inner loop:

```vba
Dim i As Integer, j As Integer
For i = 1 To 3
    For j = 1 To 2
        Print i, j
    Next j
Next i
```

Result:

```
1  1  
1  2  
2  1  
2  2  
3  1  
3  2  
```

For Loops & Do While Loops

- These are equivalent:

```vba
Dim i As Integer, j As Integer
For i = 1 To 3
    For j = 1 To 2
        Print i, j
    Next j
Next i
```

```vben
Dim i As Integer, j As Integer
i = 1
Do While i <= 3
    j = 1
    Do While j <= 2
        Print i, j
        j = j + 1
    Loop
    i = i + 1
Loop
```

Mini-Exercise

- How many squids does this print?

```vba
Dim i As Integer, j As Integer
For i = 1 To 20
    For j = 1 To 30
        Print "squid"
    Next j
Next i
```

Answer: 600 squids!

Mini-Exercise -- Answer

- How many squids does this print?

```vba
Dim i As Integer, j As Integer
For i = 1 To 20
    For j = 1 To 30
        Print "squid"
    Next j
Next i
```

Mini-Exercise

- What does this print?

```vba
Dim i As Integer, j As Integer
For i = 0 To 3
    For j = 1 To i
        Print i, j
    Next j
Next i
```
What does this print?

```vbnet
Dim i As Integer, j As Integer
For i = 0 To 3
    For j = 1 To i
        Print i, j
    Next j
Next i
```

1  1
2  1
2  2
3  1
3  2
3  3

Note that the upper bound for the inner loop depends on the loop variable for the outer loop.