The **for** Loop Repetition Structure

- The **for** loop handles details of the counter-controlled loop "automatically".
- The initialization of the loop control variable, the termination condition test, and control variable modification are handled in the **for** loop structure.

```cpp
for ( i = 1; i < 101; i = i + 1) {
    // initialization
    // modification
    test
}
```
When Does a for Loop Initialize, Test and Modify?

- A for loop
  - Initializes the loop control variable before beginning the first loop iteration,
  - Modifies the loop control variable at the very end of each iteration of the loop, and
  - Performs the loop termination test before each iteration of the loop.

- The for loop is easier to write and read for counter-controlled loops.
A for Loop That Counts From 0 to 9

```javascript
for(i = 0; i < 10; i = i + 1)
{
    alert("i is " + i);
}
```
We Can Count Backwards, Too

```javascript
for(i = 9; i >= 0; i = i - 1) {
    alert("i is " + i);
}
```
We Can Count By 2’s ... or 7’s ... or Whatever

```javascript
for(i = 0; i < 10; i = i + 2) {
    alert("i is " + i);
}
```
Nested Loops

- Loops may be **nested (embedded)** inside of each other.
- Actually, any control structure (sequence, selection, or repetition) may be nested inside of any other control structure.
- It is common to see nested for loops.
Nested for Loops

1. for (i = 1; i < 5; i = i + 1)
2. {
3.   for (j = 1; j < 3; j = j + 1)
4.     {
5.         
6.     }
7.   }
8. }
Nested for Loops

1. for (i = 1; i < 5; i = i + 1)
2. {
3.     for( j = 1; j < 3; j = j + 1)
4.         {
5.             if (j % 2 == 0)  
6.                 {  
7.                     document.write("O");  
8.                 }
9.             else  
10.                 {  
11.                     document.write("X");  
12.                 }
13.         }  
14.     document.write("<br />");  
15. }

How many times is the "if" statement executed?
What is the output?
The break Statement

- The **break** statement can be used in **while**, **do-while**, and **for** loops to cause premature exit of the loop.

- **THIS IS NOT** a recommended coding technique.
Example break in a for Loop

```javascript
var i;
for(i = 1; i < 10; i = i + 1)
{
    if(i == 5)
    {
        break;
    }
    document.write(i + " ");
}
document.write("Broke out of loop at i = " + i);
```

**OUTPUT:**

```
1 2 3 4
Broke out of loop at i = 5.
```
The continue Statement

- The **continue** statement can be used in **while**, **do-while**, and **for** loops.
- It causes the remaining statements in the body of the loop to be skipped for the current iteration of the loop.
- **THIS IS NOT** A RECOMMENDED CODING TECHNIQUE.
Example continue in a for Loop

```javascript
var i;
for(i = 1; i < 10; i = i + 1)
{
  if(i == 5)
  {
    continue;
  }
  document.write(i + " ");
}
document.write("Done.");
```

**OUTPUT:**

```
1 2 3 4 6 7 8 9
Done.
```