

More Operators and Control Structures

- ❖ More Operators
 - ◆ Increment and Decrement (Unary)
 - ◆ Compound Assignment (Shorthand)
 - ◆ Logical (true/false)
- ❖ More Control Structures
 - ◆ switch case
 - ◆ do while
 - ◆ for

Copyright © 2005 R.M. Laurie | 1

More Operators

- Object Property (Encapsulated in object)
Select property or method of an object.
Stay tuned for more details...
- ++ Increment (Unary)
Number++; // Number = Number + 1;
- Decrement (Unary)
Number--; // Number = Number - 1;
- Combined Assignment
 - += Addition Assignment Operator
 - = *= /= %=

Copyright © 2005 R.M. Laurie | 2

Operator Examples

```

Num++; // Num=Num+1 (Post-increment)
++Num; // Num=Num+1 (Pre-increment)
Num--; // Num=Num-1 (Post-decrement)
--Num; // Num=Num-1 (Pre-decrement)

A += 2; // A=A+2
B -= 1; // B=B-1
C *= 4; // C=C*4
D /= 2; // D=D/2
E %= 5; // E=E%5
    
```

Copyright © 2005 R.M. Laurie | 3

Logical Operators

- ❖ Used in while and if assertions true/false
- ❖ There are three logical operators
 - ◆ AND &&
 - ◆ OR ||
 - ◆ NOT !

A	B	A && B
F	F	F
F	T	F
T	F	F
T	T	T

A	B	A B
F	F	F
F	T	T
T	F	T
T	T	T

A	!A
F	T
T	F

Note on Precedence: Evaluate relational first and then logical

Copyright © 2005 R.M. Laurie | 4

Logical Operator Examples

```

if(A==B && A==C)
!(A || B)
!A && !B
A <= B || C == D
A = B == 0;
if(A != 0)
if(A = 0) // Error use ==
if(Question == "C" || Question == "c")
SSN > 999999999 || SSN < 0
Tax == 0 || Tax == 15 || Tax == 28
    
```

Copyright © 2005 R.M. Laurie 5

Operators Precedence

(Highest to Lowest)

. () - ++ -- ! * / % + - < <= > >= == != && = += -= *= /= %=	Property access of an object Defines order of operation Minus, Increment, Decrement Logical NOT Operator Multiply, Division, Remainder Addition, Subtraction } Relational Operators Logical AND Operator Logical OR Operator Compound Assignment
--	---

Copyright © 2005 R.M. Laurie 6

do - while Structure

- ❖ A loop structure that guarantees the loop body is executed once.
- ❖ Condition is tested at bottom of loop
- ❖ Don't forget the semicolon for while(...);

```

Initialize Counter;
do
{
    statement1;
    statement2;
    Increment Counter;
}while(Check Counter);
    
```

```

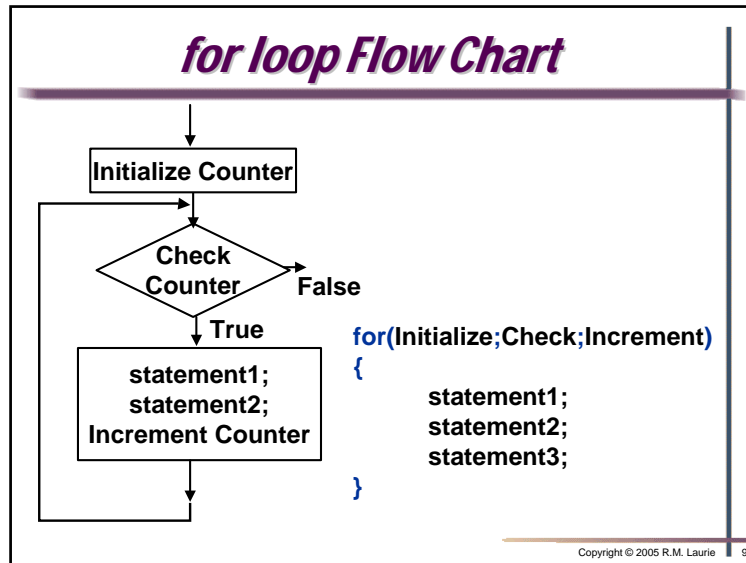
Initialize Counter;
do
{
    statement1;
    statement2;
    Increment Counter;
}while(Check Counter);
    
```

Copyright © 2005 R.M. Laurie 7

Filtered Input Application

```

<head>
<title>Filtered Data Entry</title>
<script type="text/javascript">
    var Entry;
    do
    {
        Entry = window.prompt( "Do you like Programming?", "y or n" );
    }while(!(Entry=="y" || Entry=="Y" || Entry=="n" || Entry=="N"));
    if( Entry == "y" || Entry == "Y" )
        document.writeln("<h2>I'm glad you like programming!</h2>");
    else
        document.writeln("<h2>You will like it if you study.</h2>");
</script>
</head>
<body>
<p>Click Refresh (or Reload) to run the script again</p>
</body>
    
```



for Loop Example

```

<head>
<title>Grade Determination</title>
<script type = "text/javascript">
var Score = 0, ScoreTotal = 0, Count = 0;
for(Count = 1; Count <= 5; Count++)
{
    Score = parseInt(window.prompt("Enter Score", ""));
    ScoreTotal = ScoreTotal + Score;
    document.writeln("Score " + Count + " = " + Score + "<br/>");
}
document.writeln("<h2>The Average Score = "
    + ScoreTotal / 5 + "</h2>");
</script>
</head>
<body>
<p>Click Refresh (or Reload) to run the script again</p>
</body>
    
```

Copyright © 2005 R.M. Laurie 10

for Loop & Combined Declaration Example

```

<head>
<title>Grade Determination</title>
<script type = "text/javascript">
for(var Score=0, ScoreTotal=0, Count=1; Count <= 5; Count++)
{
    Score = parseInt(window.prompt("Enter Score", ""));
    ScoreTotal = ScoreTotal + Score;
    document.writeln("Score " + Count + " = " + Score + "<br/>");
}
document.writeln("<h2>The Average Score = "
    + ScoreTotal / 5 + "</h2>");
</script>
</head>
<body>
<p>Click Refresh (or Reload) to run the script again</p>
</body>
    
```

Copyright © 2005 R.M. Laurie 11

Nested for Example

```

<head>
<title>Multiplication Table</title>
<script type = "text/javascript">
document.writeln("<h2>Multiplication Table</h2><h3>");
for(var i = 1; i <= 5; i++)
{
    for(var j = 0; j <= 3; j++)
    {
        document.writeln( i * j + "&nbsp;");
    }
    document.writeln("<br />");
}
document.writeln("</h3>");
</script>
</head>
<body>
<p>Click Refresh (or Reload) to run the script again</p>
</body>
    
```

Copyright © 2005 R.M. Laurie 12

switch - case Structure

- ❖ A selection structure that can be used to select one of many branches

```
switch (Grade)
{
    case "P": case "p":
        window.alert("You Passed");
        break;
    case "F": case "f":
        window.alert("You Failed");
        break;
    default:
        window.alert("Incorrect letter Grade.");
}
```

Copyright © 2005 R.M. Laurie 13

```
<head> <title>Filtered Data Entry</title><script type="text/javascript">
var Entry, Count = 0;
do
{
    Entry = window.prompt( "Enter the letter Grade or Q=Quit", "A B C D F Q");
    switch (Entry)
    {
        case "A": case "a":
            window.alert("Excellent work");
            break;
        case "B": case "b":
            window.alert("Good work");
            break;
        case "C": case "c":
            window.alert("Average work");
            break;
        case "D": case "d":
            window.alert("Poor work");
            break;
        case "F": case "f":
            window.alert("Incorrect letter Grade.");
            break;
        case "Q": case "q":
            break;
        default: // catch all other characters
            window.alert("Incorrect letter Grade.");
    }
} while ( Entry != "Q" && Entry != "q");
window.alert("Quit"); </script> </head> <body>Click Refresh to repeat </body>
```

Exercises

- ❖ Create a program that will prompt for times in 2400 hours time format and convert the times to 12 hour format.
 - ◆ Ask if another time is to be converted? Y or N
 - ◆ Display the time in both formats.
 - 2230 = 10:30pm
 - 1115 = 11:15am
- ❖ Create a program that will display a multiplication table for values 1 to 10

	1	2	3	4	5	6	7
1	1	2	3	4	5	6	7
2	2	4	6	8	10	12	14
3	3	6	9	12	15	18	21

Copyright © 2005 R.M. Laurie 15