# JavaScript: Strutture di Controllo



# Sommario

- Introduzione
- Algoritmi e Pseudocodice
- Strutture di Controllo
- if, if …else
- while
- Assegnamento e Incremento / Decremento
- Tipizzazione
- Ciclo for
- Selezione multipla (switch)
- Ciclo do…while
- Istruzioni break e continue
- Operatori Logici
- Web Resources



# Obiettivi

- Capire le tecniche di base di problem-solving
- Essere in grado di sviluppare algoritmi
- Essere in grado di usare i costrutti di base per la selezione e iterazione
- Essere in grado di usare gli opertatori di incremento/decremento



# Introduzione

- Per scrivere uno script è necessario
  - Capire precisamente il problema
  - Pianificare dettagliatamente l'approccio
  - Capire gli elementi di base disponibili
  - Applicare i principi di buona programmazione

# Algoritmi

- Specificano le azioni che devono essere eseguite per giungere alla soluzione



# Pseudocodice

- Artificiale
- Informale
- Aiuta il programmatore a sviluppare algoritmi



# Strutture di Controllo (1)

- Esecuzione sequenziale
  - Le istruzioni sono eseguite nell'ordine con cui sono scritte, una dopo l'altra
- Trasferimento del controllo
  - Talvolta l'istruzione che deve essere eseguita potrebbe non essere quella immediatamente successiva



# Strutture di Controllo (2)

- Tre strutture di controllo
  - Sequenza
  - Selezione
    - `if`
    - `if...else`
    - `switch`
  - Ripetizione
    - `while`
    - `do...while`
    - `for`
    - `for...in`

# Strutture di Controllo (3)

- Flowchart
  - Rappresentazione grafica di (una parte di) un algoritmo
  - Linee di flusso (Flowlines)
    - Indicano l'ordine con cui sono eseguite le azioni specificate dall'algortimo

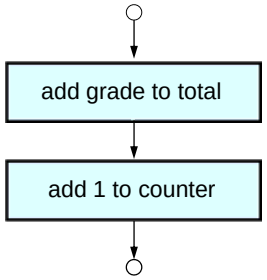


# Strutture di Controllo (4)

- Rettangolo
  - Indica un generico tipo di azione
- Ovale
  - Un algoritmo completo
- Cerchio
  - Una parte di un algoritmo
- Diamante
  - Indica un punto di decisione relativamente al valore di verità di una condizione



# Strutture di Controllo (5)




```
total = total + grade;
counter = counter + 1;
```



# Parole Riservate di JavaScript

| JavaScript Keywords | | | | |
|---|---|---|---|---|
| break | case | catch | continue | default |
| delete | do | else | finally | for |
| function | if | in | instanceof | new |
| return | switch | this | throw | try |
| typeof | var | void | while | with |
| *Keywords that are reserved but not currently used by JavaScript* | | | | |
| abstract | boolean | byte | char | class |
| const | debugger | double | enum | export |
| extends | final | float | goto | implements |
| import | int | interface | long | native |
| package | private | protected | public | short |
| static | super | synchronized | throws | transient |
| volatile | | | | |

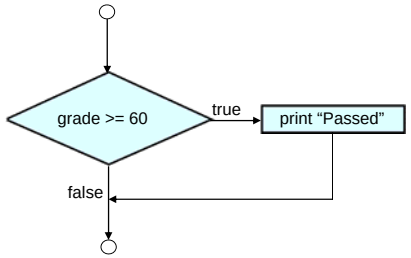
Fig. 8.2 JavaScript keywords.

# Selezione `if` (1)

- Indica l'azione che deve essere eseguita solo quando la condizione è vera



# Selezione `if` (2)






# Selezione `if…else` (1)

- Indica le diverse possibili azioni che devono essere eseguite quando la condizione è vera o quando è falsa
- Operatore Condizionale (`?:`)
  - È l'unico operatore ternario di JavaScript
    - Rappresenta un'espressione condizionale
    - Tre operandi
      - L'espressione booleana che deve essere valutata;
      - Il valore assunto dall'espressione condizionale nel caso in cui l'espressione sia vera;
      - Il valore assunto dall'espressione condizionale nel caso in cui l'espressione sia falsa



# Selezione `if…else` (2)

- Dangling-else problem
  - L'interprete JavaScript associa ogni else all'if precedente più vicino
- Ad esempio:

```
if (x>5)
  if (y>5)
      document.writeln("sia x che y sono > 5)
  else
      document.writeln ("x è <=5")
```

Se x = 6 e y = 3, l'output è

```
x è <=5
```

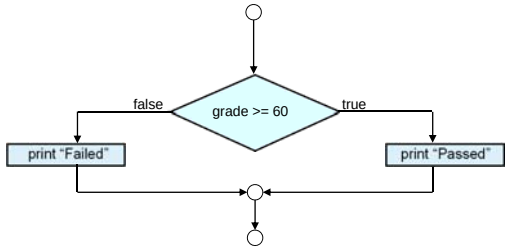
# Selezione `if…else` (3)

- Per evitare il problema si usano i delimitatori di blocco { e }
- L'esempio corretto è

```
if (x>5)
{
   if (y>5)
       document.writeln("sia x che y sono > 5)
}
else
   document.writeln ("x è <=5")
```



# Selezione `if…else` (4)



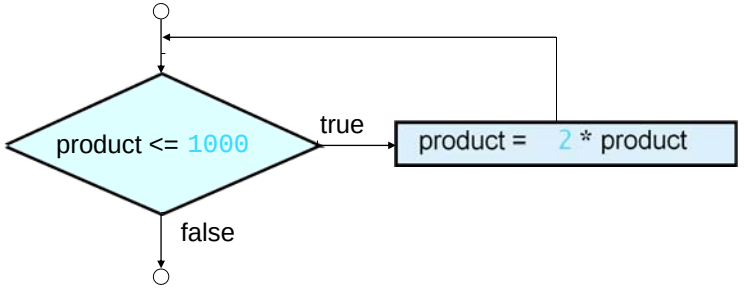



# Ripetizione `while` (1)

- Struttura di ripetizione (loop)
  - Ripete l'azione fin tanto che la condizione è vera



# Ripetizione `while` (2)



```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 8.7: average.html -->
6  <!-- Class Average Program  -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Class Average Program</title>
11
12       <script type = "text/javascript">
13          <!--
14          var total,          // sum of grades
15              gradeCounter,   // number of grades entered
16              gradeValue,     // grade value
17              average,        // average of all grades
18              grade;          // grade typed by user
19
20          // Initialization Phase
21          total = 0;          // clear total
22          gradeCounter = 1;   // prepare to loop
23
```



```
24          // Processing Phase
25          while ( gradeCounter <= 10 ) {  // loop 10 times
26
27             // prompt for input and read grade from user
28             grade = window.prompt( "Enter integer grade:", "0" );
29
30             // convert grade from a string to an integer
31             gradeValue = parseInt( grade );
32
33             // add gradeValue to total
34             total = total + gradeValue;
35
36             // add 1 to gradeCounter
37             gradeCounter = gradeCounter + 1;
38          }
39
40          // Termination Phase
41          average = total / 10;  // calculate the average
42
43          // display average of exam grades
44          document.writeln(
45             "<h1>Class average is " + average + "</h1>" );
46          // -->
47       </script>
```



```
48
49    </head>
50    <body>
51       <p>Click Refresh (or Reload) to run the script again<p>
52    </body>
53 </html>
```





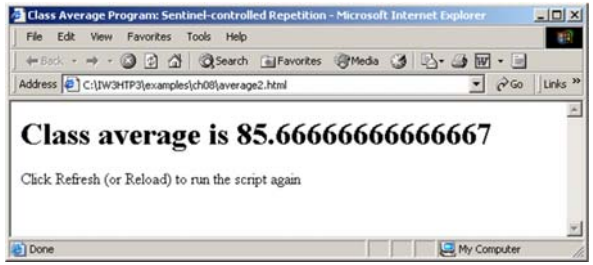
```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 8.9: average2.html        -->
6  <!-- Sentinel-controlled Repetition -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Class Average Program:
11           Sentinel-controlled Repetition</title>
12
13       <script type = "text/javascript">
14          <!--
15          var gradeCounter,  // number of grades entered
16              gradeValue,    // grade value
17              total,         // sum of grades
18              average,       // average of all grades
19              grade;         // grade typed by user
20
21          // Initialization phase
22          total = 0;         // clear total
23          gradeCounter = 0;  // prepare to loop
24
```

```
25          // Processing phase
26          // prompt for input and read grade from user
27          grade = window.prompt(
28               "Enter Integer Grade, -1 to Quit:", "0" );
29
30          // convert grade from a string to an integer
31          gradeValue = parseInt( grade );
32
33          while ( gradeValue != -1 ) {
34             // add gradeValue to total
35             total = total + gradeValue;
36
37             // add 1 to gradeCounter
38             gradeCounter = gradeCounter + 1;
39
40             // prompt for input and read grade from user
41             grade = window.prompt(
42                  "Enter Integer Grade, -1 to Quit:", "0" );
43
44             // convert grade from a string to an integer
45             gradeValue = parseInt( grade );
46          }
47
```



```
48          // Termination phase
49          if ( gradeCounter != 0 ) {
50             average = total / gradeCounter;
51
52             // display average of exam grades
53             document.writeln(
54                "<h1>Class average is " + average + "</h1>" );
55          }
56          else
57             document.writeln( "<p>No grades were entered</p>" );
58          // -->
59       </script>
60    </head>
61
62    <body>
63       <p>Click Refresh (or Reload) to run the script again</p>
64    </body>
65 </html>
```



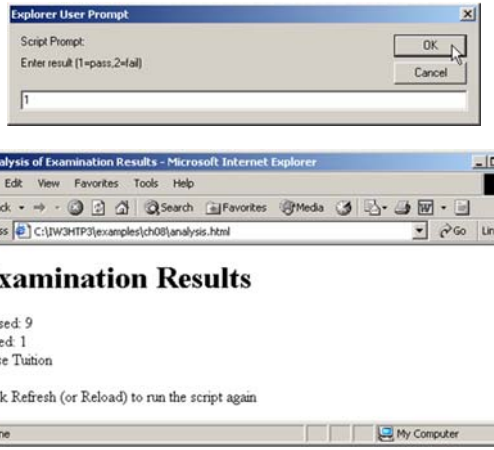





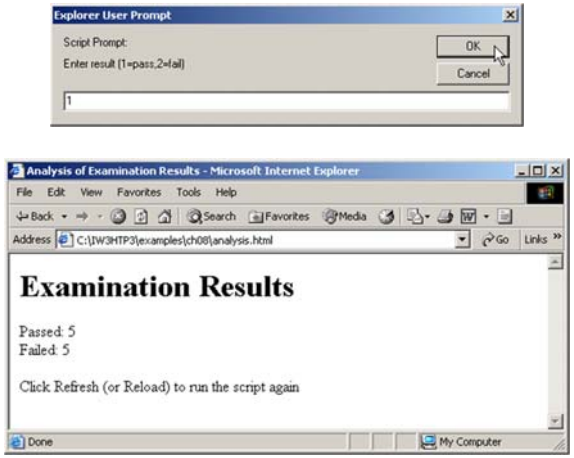

```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 8.11: analysis.html -->
6  <!-- Analyzing Exam Results   -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Analysis of Examination Results</title>
11
12       <script type = "text/javascript">
13          <!--
14          // initializing variables in declarations
15          var passes = 0,      // number of passes
16              failures = 0,    // number of failures
17              student = 1,     // student counter
18              result;          // one exam result
19
20          // process 10 students; counter-controlled loop
21          while ( student <= 10 ) {
22             result = window.prompt(
23                "Enter result (1=pass,2=fail)", "0" );
24
```

```
25            if ( result == "1" )
26               passes = passes + 1;
27            else
28               failures = failures + 1;
29
30            student = student + 1;
31         }
32
33         // termination phase
34         document.writeln( "<h1>Examination Results</h1>" );
35         document.writeln(
36            "Passed: " + passes + "<br />Failed: " + failures );
37
38         if ( passes > 8 )
39            document.writeln( "<br />Raise Tuition" );
40         // -->
41      </script>
42
43   </head>
44   <body>
45      <p>Click Refresh (or Reload) to run the script again</p>
46   </body>
47 </html>
```










# Operatori di Assegnamento

| Assignment operator | Initial value of variable | Sample expression | Explanation | Assigns |
|---|---|---|---|---|
| += | c = 3 | c += 7 | c = c + 7 | 10 to c |
| -= | d = 5 | d -= 4 | d = d - 4 | 1 to d |
| *= | e = 4 | e *= 5 | e = e * 5 | 20 to e |
| /= | f = 6 | f /= 3 | f = f / 3 | 2 to f |
| %= | g = 12 | g %= 9 | g = g % 9 | 3 to g |

Fig. 8.12 Arithmetic assignment operators.

# Operatori di Incremento e Decremento (1)

- Sono utilizzati per incrementare / decrementare il valore di una variabile che deve essere usato in un'espressione
  - Operatore di Preincremento / Predecremento:
    - l'operatore è posto prima della variabile
    - la variabile viene incrementata/decrementata e nell'espressione viene utilizzato il nuovo valore
  - Operatore di Postincremento / Postdecremento:
    - l'operatore è posto dopo la variabile
    - nell'espressione viene utilizzato il vecchio valore della variabile, e alla fine del calcolo dell'espressione, la variabile viene incrementata/decrementata



# Operatori di Incremento e Decremento (2)

| Operator | Called | Sample expression | Explanation |
|---|---|---|---|
| ++ | preincrement | ++a | Increment a by 1, then use the new value of a in the expression in which a resides. |
| ++ | postincrement | a++ | Use the current value of a in the expression in which a resides, then increment a by 1. |
| -- | predecrement | --b | Decrement b by 1, then use the new value of b in the expression in which b resides. |
| -- | postdecrement | b-- | Use the current value of b in the expression in which b resides, then decrement b by 1. |

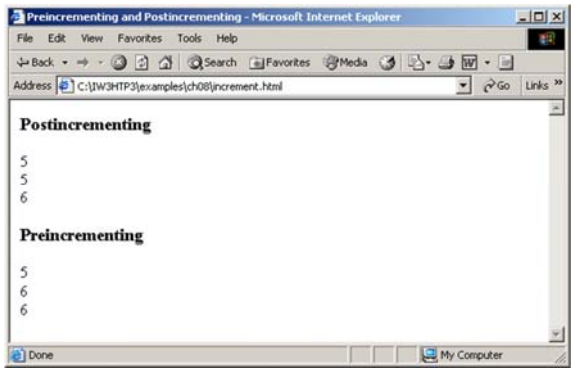
Fig. 8.13 increment and decrement operators.



```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 8.14: increment.html           -->
6  <!-- Preincrementing and Postincrementing -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Preincrementing and Postincrementing</title>
11
12       <script type = "text/javascript">
13          <!--
14          var c;
15
16          c = 5;
17          document.writeln( "<h3>Postincrementing</h3>" );
18          document.writeln( c );            // print 5
19          // print 5 then increment
20          document.writeln( "<br />" + c++ );
21          document.writeln( "<br />" + c );   // print 6
22
23          c = 5;
24          document.writeln( "<h3>Preincrementing</h3>" );
25          document.writeln( c );            // print 5
```



```
26          // increment then print 6
27          document.writeln( "<br />" + ++c );
28          document.writeln( "<br />" + c );   // print 6
29          // -->
30       </script>
31
32    </head><body></body>
33 </html>
```



# Operatori di Incremento e Decremento: Precedenza e Associatività

| Operator | Associativity | Type |
|---|---|---|
| ++ -- | right to left | unary |
| * / % | left to right | multiplicative |
| + - | left to right | additive |
| < <= > >= | left to right | relational |
| == != | left to right | equality |
| ?: | right to left | conditional |
| = += -= *= /= %= | right to left | assignment |

Fig. 8.15 Precedence and associativity of the operators discussed so far.



# Tipizzazione dei Dati

- JavaScript è debolmente tipizzato
  - Fornisce una conversione automatica di valori di tipi diversi



# Ripetizione controllata da un contatore

- Nome del contatore di controllo
- Valore iniziale
- Incremento / decremento
- Valore finale



```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 9.1: WhileCounter.html   -->
6  <!-- Counter-Controlled Repetition -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Counter-Controlled Repetition</title>
11
12       <script type = "text/javascript">
13          <!--
14          var counter = 1;            // initialization
15
16          while ( counter <= 7 ) {    // repetition condition
17             document.writeln( "<p style = \"font-size: " +
18                counter + "ex\">XHTML font size " + counter +
19                "ex</p>" );
20             ++counter;               // increment
21          }
22          // -->
23       </script>
24
```

```
25    </head><body></body>
26 </html>
```




# Ripetizione `for` (1)

- Gestisce i dettagli della ripetizione controllata da contatore



# Ripetizione `for` (2)

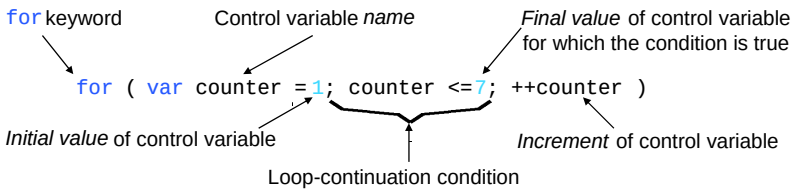
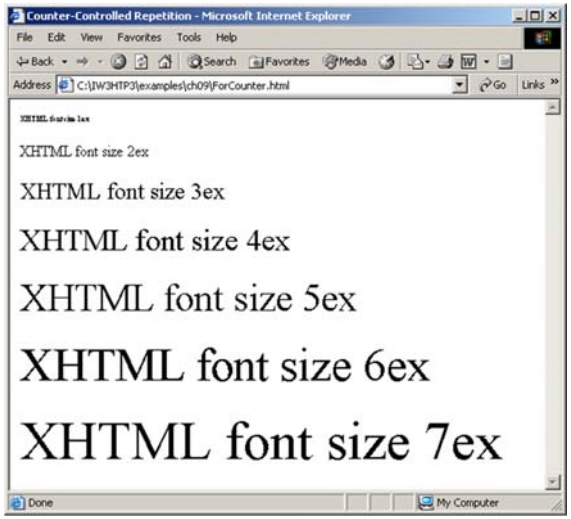



Fig. 9.3 `for` statement header components.

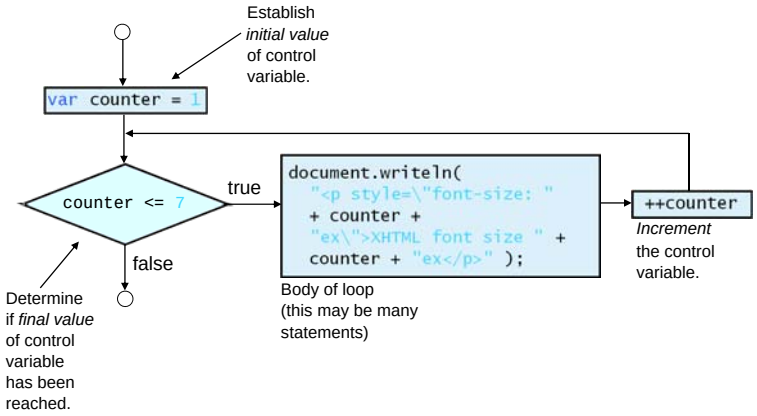


```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 9.2: ForCounter.html                          -->
6  <!-- Counter-Controlled Repetition with for statement -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Counter-Controlled Repetition</title>
11
12       <script type = "text/javascript">
13          <!--
14          // Initialization, repetition condition and
15          // incrementing are all included in the for
16          // statement header.
17          for ( var counter = 1; counter <= 7; ++counter )
18             document.writeln( "<p style = \"font-size: " +
19                counter + "ex\">XHTML font size " + counter +
20                "ex</p>" );
21          // -->
22       </script>
23
24    </head><body></body>
25 </html>
```






# Ripetizione `for`: Flow Chart



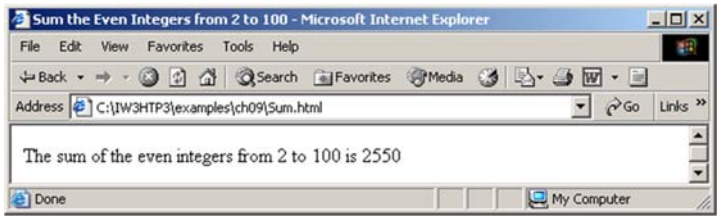



# Ripetizione `for`: Esempio

- Esempio: somma
  - Oggetto `Math`
    - Metodo `pow`
    - Metodo `round`



```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 9.5: Sum.html                -->
6  <!-- Using the for repetition statement -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Sum the Even Integers from 2 to 100</title>
11
12       <script type = "text/javascript">
13          <!--
14          var sum = 0;
15
16          for ( var number = 2; number <= 100; number += 2 )
17             sum += number;
18
19          document.writeln( "The sum of the even integers " +
20             "from 2 to 100 is " + sum );
21          // -->
22       </script>
23
24    </head><body></body>
25 </html>
```

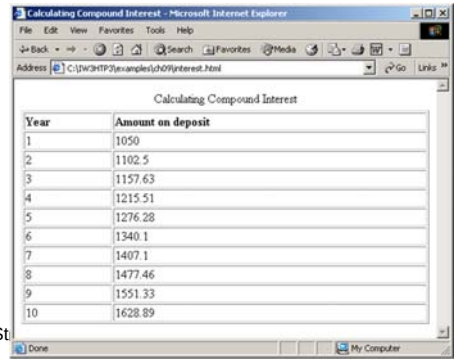





```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 9.6: Interest.html           -->
6  <!-- Using the for repetition statement -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Calculating Compound Interest</title>
11
12       <script type = "text/javascript">
13          <!--
14          var amount, principal = 1000.0, rate = .05;
15
16          document.writeln(
17             "<table border = \"1\" width = \"100%\">" );
18          document.writeln(
19             "<caption>Calculating Compound Interest</caption>" );
20          document.writeln(
21             "<thead><tr><th align = \"left\">Year</th>" );
22          document.writeln(
23             "<th align = \"left\">Amount on deposit</th>" );
24          document.writeln( "</tr></thead>" );
25
```



```
26          for ( var year = 1; year <= 10; ++year ) {
27             amount = principal * Math.pow( 1.0 + rate, year );
28             document.writeln( "<tbody><tr><td>" + year +
29                "</td><td>" + Math.round( amount * 100 ) / 100 +
30                "</td></tr>" );
31          }
32
33          document.writeln( "</tbody></table>" );
34          // -->
35       </script>
36
37    </head><body></body>
38 </html>
```






# Selezione Multipla `switch`

- Espressione di controllo
- Etichette dei possibili casi
- Caso di default

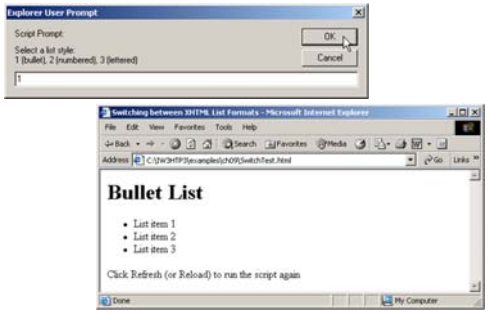
```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 9.7: SwitchTest.html  -->
6  <!-- Using the switch statement -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Switching between XHTML List Formats</title>
11
12       <script type = "text/javascript">
13          <!--
14          var choice,            // user's choice
15              startTag,          // starting list item tag
16              endTag,            // ending list item tag
17              validInput = true, // indicates if input is valid
18              listType;          // list type as a string
19
20          choice = window.prompt( "Select a list style:\n" +
21             "1 (bullet), 2 (numbered), 3 (lettered)", "1" );
22
```



```
23          switch ( choice ) {
24             case "1":
25                startTag = "<ul>";
26                endTag = "</ul>";
27                listType = "<h1>Bullet List</h1>";
28                break;
29             case "2":
30                startTag = "<ol>";
31                endTag = "</ol>";
32                listType = "<h1>Ordered List: Numbered</h1>";
33                break;
34             case "3":
35                startTag = "<ol type = \"A\">";
36                endTag = "</ol>";
37                listType = "<h1>Ordered List: Lettered</h1>";
38                break;
39             default:
40                validInput = false;
41          }
42
43          if ( validInput == true ) {
44             document.writeln( listType + startTag );
45
46             for ( var i = 1; i <= 3; ++i )
47                document.writeln( "<li>List item " + i + "</li>" );
```



```
48
49             document.writeln( endTag );
50          }
51          else
52             document.writeln( "Invalid choice: " + choice );
53          // -->
54       </script>
55
56    </head>
57    <body>
58       <p>Click Refresh (or Reload) to run the script again</p>
59    </body>
60 </html>
```



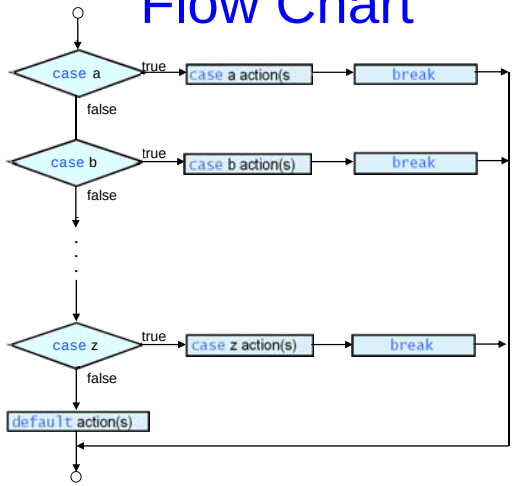








# Selezione Multipla `switch` : Flow Chart






# Ripetizione `do...while`

- Analoga alla `while`
- La condizione viene verificata dopo l'esecuzione del corpo del ciclo
- Il corpo del ciclo è sempre eseguito almeno una volta

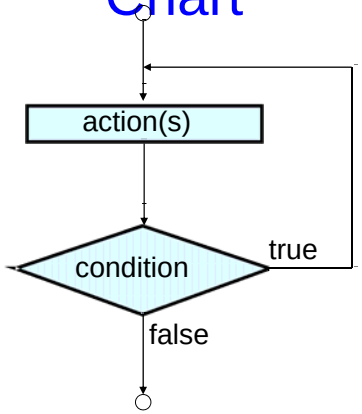


```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 9.9: DoWhileTest.html     -->
6  <!-- Using the do...while statement -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Using the do...while Repetition Statement</title>
11
12       <script type = "text/javascript">
13          <!--
14          var counter = 1;
15
16          do {
17             document.writeln( "<h" + counter + ">This is " +
18                "an h" + counter + " level head" + "</h" +
19                counter + ">" );
20
21             ++counter;
22          } while ( counter <= 6 );
23          // -->
24       </script>
```

```
25
26    </head><body></body>
27 </html>
```




# Ripetizione do…while : Flow Chart





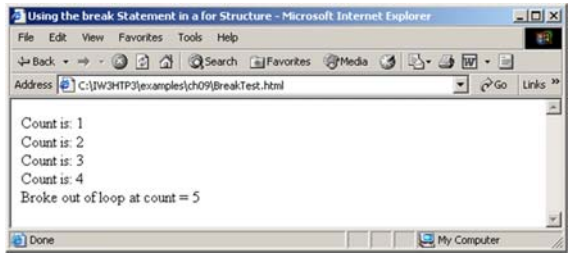

# break e continue

- break
  - Forza l'uscita immediata da una struttura
  - Salta ciò che rimane dell'istruzione switch
- continue
  - Salta ciò che rimane dell'istruzione switch
  - Continua con la successiva iterazione di un ciclo



```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 9.11: BreakTest.html   -->
6  <!-- Using the break statement   -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>
11          Using the break Statement in a for Structure
12       </title>
13
14       <script type = "text/javascript">
15          <!--
16          for ( var count = 1; count <= 10; ++count ) {
17             if ( count == 5 )
18                break;  // break loop only if count == 5
19
20             document.writeln( "Count is: " + count + "<br />" );
21          }
22
```

```
23          document.writeln(
24             "Broke out of loop at count = " + count );
25          // -->
26       </script>
27
28    </head><body></body>
29 </html>
```

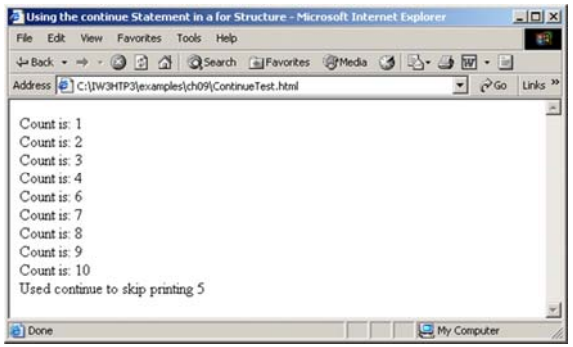





```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 9.12: ContinueTest.html  -->
6  <!-- Using the break statement     -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>
11          Using the continue Statement in a for Structure
12       </title>
13
14       <script type = "text/javascript">
15          <!--
16          for ( var count = 1; count <= 10; ++count ) {
17             if ( count == 5 )
18                continue;  // skip remaining code in loop
19                           // only if count == 5
20
21             document.writeln( "Count is: " + count + "<br />" );
22          }
23
```



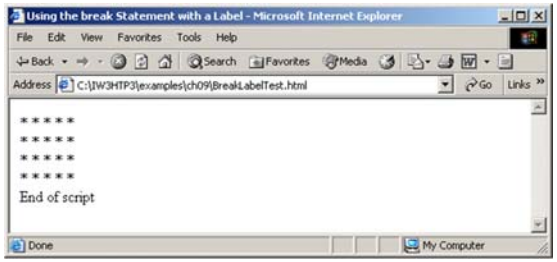
```
24          document.writeln( "Used continue to skip printing 5" );
25          // -->
26       </script>
27
28    </head><body></body>
29 </html>
```






```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 9.13: BreakLabelTest.html         -->
6  <!-- Using the break statement with a Label -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Using the break Statement with a Label</title>
11
12       <script type = "text/javascript">
13          <!--
14          stop: {   // labeled block
15             for ( var row = 1; row <= 10; ++row ) {
16                for ( var column = 1; column <= 5 ; ++column ) {
17
18                   if ( row == 5 )
19                      break stop; // jump to end of stop block
20
21                   document.write( "* " );
22                }
23
24                document.writeln( "<br />" );
25             }
```

```
26
27            // the following line is skipped
28            document.writeln( "This line should not print" );
29         }
30
31         document.writeln( "End of script" );
32         // -->
33      </script>
34
35   </head><body></body>
36 </html>
```

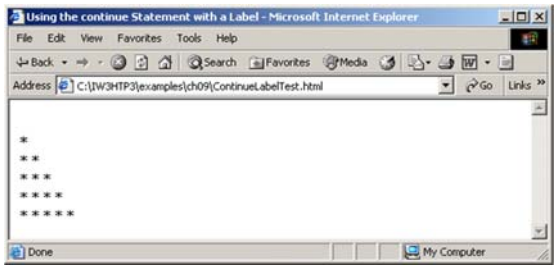





```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 9.14: ContinueLabelTest.html -->
6  <!-- Using the continue statement      -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Using the continue Statement with a Label</title>
11
12       <script type = "text/javascript">
13          <!--
14          nextRow:   // target label of continue statement
15             for ( var row = 1; row <= 5; ++row ) {
16                document.writeln( "<br />" );
17
18                for ( var column = 1; column <= 10; ++column ) {
19
20                   if ( column > row )
21                      continue nextRow; // next iteration of
22                                        // labeled loop
23
24                   document.write( "* " );
25                }
```



```
26          }
27       // -->
28    </script>
29
30 </head><body></body>
31 </html>
```






# Operatori Logici (1)

- AND Logico ( && )
- OR Logico ( || )
- NOT Logico ( ! )

# Operatori Logici (2)

| expression1 | expression2 | expression1 && expression2 |
|---|---|---|
| false | false | false |
| false | true | false |
| true | false | false |
| true | true | true |

Fig. 9.15 Truth table for the && (logical AND) operator.



# Operatori Logici (3)

| expression1 | expression2 | expression1 \|\| expression2 |
|---|---|---|
| false | false | false |
| false | true | true |
| true | false | true |
| true | true | true |

Fig. 9.16 Truth table for the || (logical OR) operator.

| expression | !expression |
|---|---|
| false | true |
| true | false |

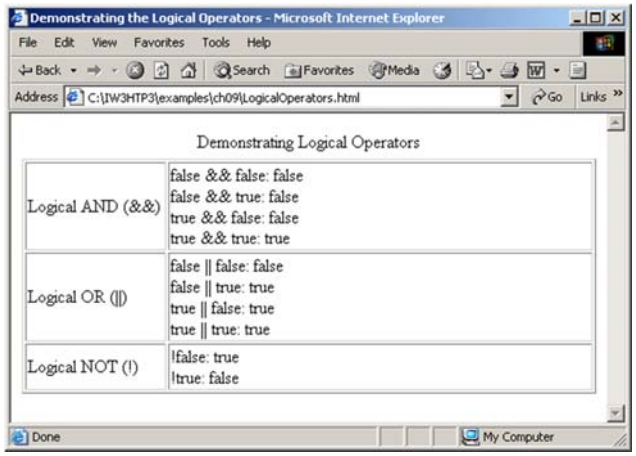
Fig. 9.17 Truth table for operator ! (logical negation).



```
1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3     "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4
5  <!-- Fig. 9.18: LogicalOperators.html  -->
6  <!-- Demonstrating Logical Operators    -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10       <title>Demonstrating the Logical Operators</title>
11
12       <script type = "text/javascript">
13          <!--
14          document.writeln(
15             "<table border = \"1\" width = \"100%\">" );
16
17          document.writeln(
18             "<caption>Demonstrating Logical " +
19             "Operators</caption" );
20
21          document.writeln(
22             "<tr><td width = \"25%\">Logical AND (&&)</td>" +
23             "<td>false && false: " + ( false && false ) +
24             "<br />false && true: " + ( false && true ) +
25             "<br />true && false: " + ( true && false ) +
```



```
26             "<br />true && true: " + ( true && true ) +
27             "</td>" );
28
29          document.writeln(
30             "<tr><td width = \"25%\">Logical OR (||)</td>" +
31             "<td>false || false: " + ( false || false ) +
32             "<br />false || true: " + ( false || true ) +
33             "<br />true || false: " + ( true || false ) +
34             "<br />true || true: " + ( true || true ) +
35             "</td>" );
36
37          document.writeln(
38             "<tr><td width = \"25%\">Logical NOT (!)</td>" +
39             "<td>!false: " + ( !false ) +
40             "<br />!true: " + ( !true ) + "</td>" );
41
42          document.writeln( "</table>" );
43          // -->
44       </script>
45
46    </head><body></body>
47 </html>
```






# Operatori Logici: Precedenze e Associatività

| Operator | Associativity | Type |
|---|---|---|
| ++ -- ! | right to left | unary |
| * / % | left to right | multiplicative |
| + - | left to right | additive |
| < <= > >= | left to right | relational |
| == != | left to right | equality |
| && | left to right | logical AND |
| \|\| | left to right | logical OR |
| ?: | right to left | conditional |
| = += -= *= /= %= | right to left | assignment |

Fig. 9.19 Precedence and associativity of the operators discussed so far.



# Web Resources

- www.javascriptmall.com
- developer.netscape.com/tech/javascript
- www.mozilla.org/js/language