

Math Facts

1 + 1 = 2
2 + 2 = 4
3 + 3 = 6

The end of the math facts

Three things you need with loops:

- 1) set the control
- 2) check the control
- 3) change the control

```
1 <html>
2 <head>
3 <title>This is a math facts program</title>
4 </head>
5 <body>
6 <h2>Math Facts</h2>
7 <script type="text/javascript">
8   var ct = 1;
9   while (ct <= 3)
10  {
11    ans = ct + ct;
12    document.write(ct + " + " + ct + " = " + ans + "<br />");
13    ct = ct + 1;
14  }
15 </script>
16 <h2>The end of the math facts</h2>
17 </body>
18 <html> Note this should be </html>
```

Source of: <http://cisweb.bristolcc.edu/~pgrocer/CIS120/Sloop/jsdowhile.html> - Mozilla Firefox

```
1 <html>
2 <head>
3 <title>This is a math facts program</title>
4 </head>
5 <body>
6 <h2>Math Facts</h2>
7 <script type="text/javascript">
8 var ct = 1;
9 do
10 {
11 ans = ct + ct;
12 document.write(ct + " + " + ct + " = " + ans + "<br />");
13 ct = ct + 1;
14 } while (ct <= 3);
15 </script>
16 <h2>The end of the math facts</h2>
17 </body>
18 </html>
```

Now I want to do the same thing using the do...while with the test at the end as opposed to the while with the test at the top. This means that since the check is after the loop the loop will always be executed once.

Note - it is better to not have the semi-colon - but it does work.

Source of: <http://cisweb.bristolcc.edu/~pgrocer/CIS120/Sloop/jswhile.html> - Mozilla Firefox

```
1 <html>
2 <head>
3 <title>This is a math facts program</title>
4 </head>
5 <body>
6 <h2>Math Facts</h2>
7 <script type="text/javascript">
8 var ct = 1;
9 while (ct <= 3)
10 {
11 ans = ct + ct;
12 document.write(ct + " + " + ct + " = " + ans + "<br />");
13 ct = ct + 1;
14 }
15 </script>
16 <h2>The end of the math facts</h2>
17 </body>
18 </html>
```

Firefox automatically sends some c

12:35 PM
10/21/2014

The screenshot shows a Mozilla Firefox browser window. The address bar displays the URL: `http://cisweb.bristolcc.edu/~pgrocer/CIS120/JSloop/jsdowhile.html`. The page content includes:

Math Facts

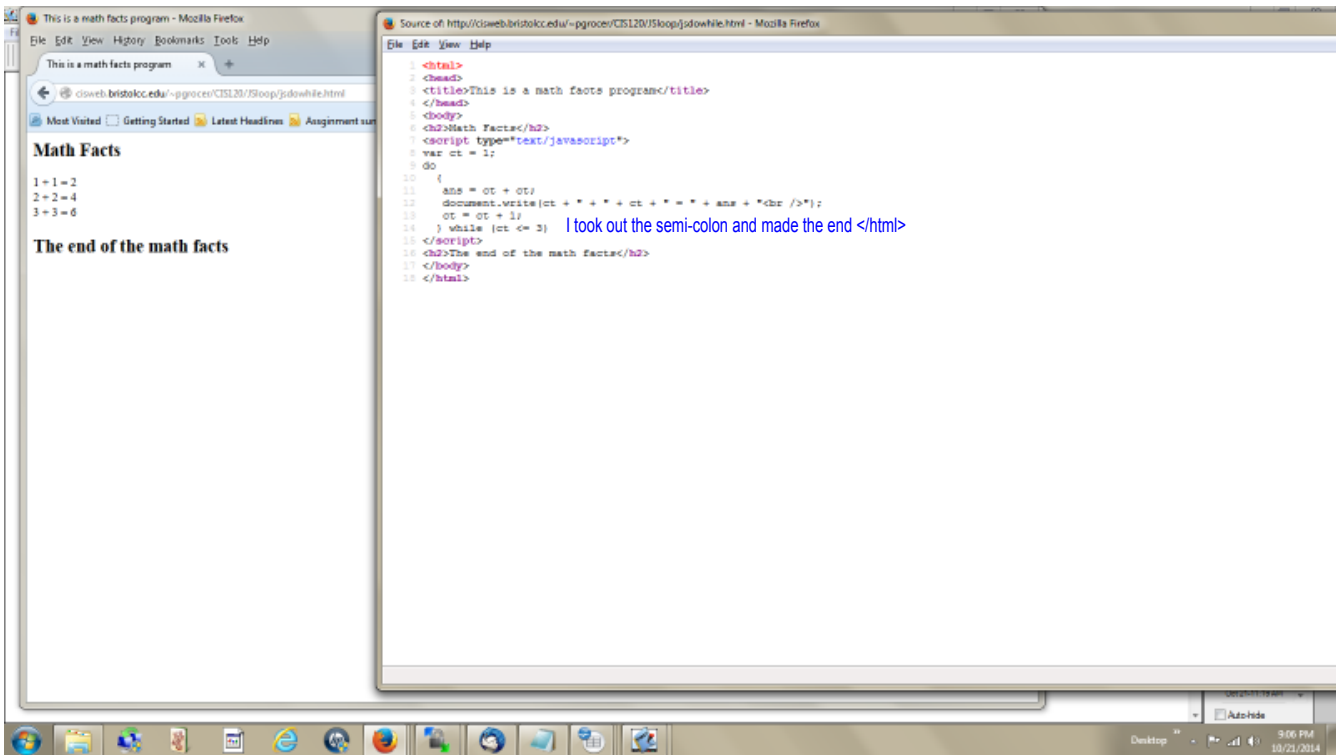
1 + 1 = 2
2 + 2 = 4
3 + 3 = 6

The end of the math facts

The source code view shows the following HTML and JavaScript code:

```
1 <html>
2 <head>
3 <title>This is a math facts program</title>
4 </head>
5 <body>
6 <h2>Math Facts</h2>
7 <script type="text/javascript">
8   var ct = 1;
9   do
10  {
11    ans = ct + ct;
12    document.write(ct + " + " + ct + " = " + ans + "<br />");
13    ct = ct + 1;
14  } while (ct <= 3);
15 </script>
16 <h2>The end of the math facts</h2>
17 </body>
18 </html>
```

The Windows taskbar at the bottom shows the system clock as 12:36 PM on 10/21/2014.



The screenshot shows a browser window with a page titled "This is a math facts program". The page content includes:

Math Facts
1+1=2
2+2=4
3+3=6

The end of the math facts

Note that the for has the set, the check and the change all enclosed in () with the for

```
1 <html>
2 <head>
3 <title>This is a math facts program</title>
4 </head>
5 <body>
6 <h2>Math Facts</h2>
7 <script type="text/javascript">
8   var i;
9   for (i=1; i<=3; i=i+1)
10    {
11      ans = i + i;
12      document.write(i + "+" + i + "=" + ans + "<br />");
13    }
14 </script>
15 <h2>The end of the math facts</h2>
16 </body>
17 </html>
```

Handwritten green annotations: "set" points to line 9, "check" points to line 10, and "change" points to line 11. A note next to line 11 says "Another way to increment is i++".

The screenshot shows a web browser window with a tab titled "This is a math facts program". The address bar shows the source URL: `http://cisweb.bristolcc.edu/~pgrocer/CIS120/JSloop/jswhile2.html`. The browser content area displays the output of a JavaScript program, which is a list of math facts: `1+1=2`, `1+2=3`, `1+3=4`, `2+1=3`, `2+2=4`, `2+3=5`, `3+1=4`, `3+2=5`, and `3+3=6`. Handwritten blue annotations label these as "Inner" loops. Below the facts, the text "The end of the m" is visible, with a blue arrow pointing to the variable `ctin` in the code. The code editor shows the following HTML and JavaScript code:

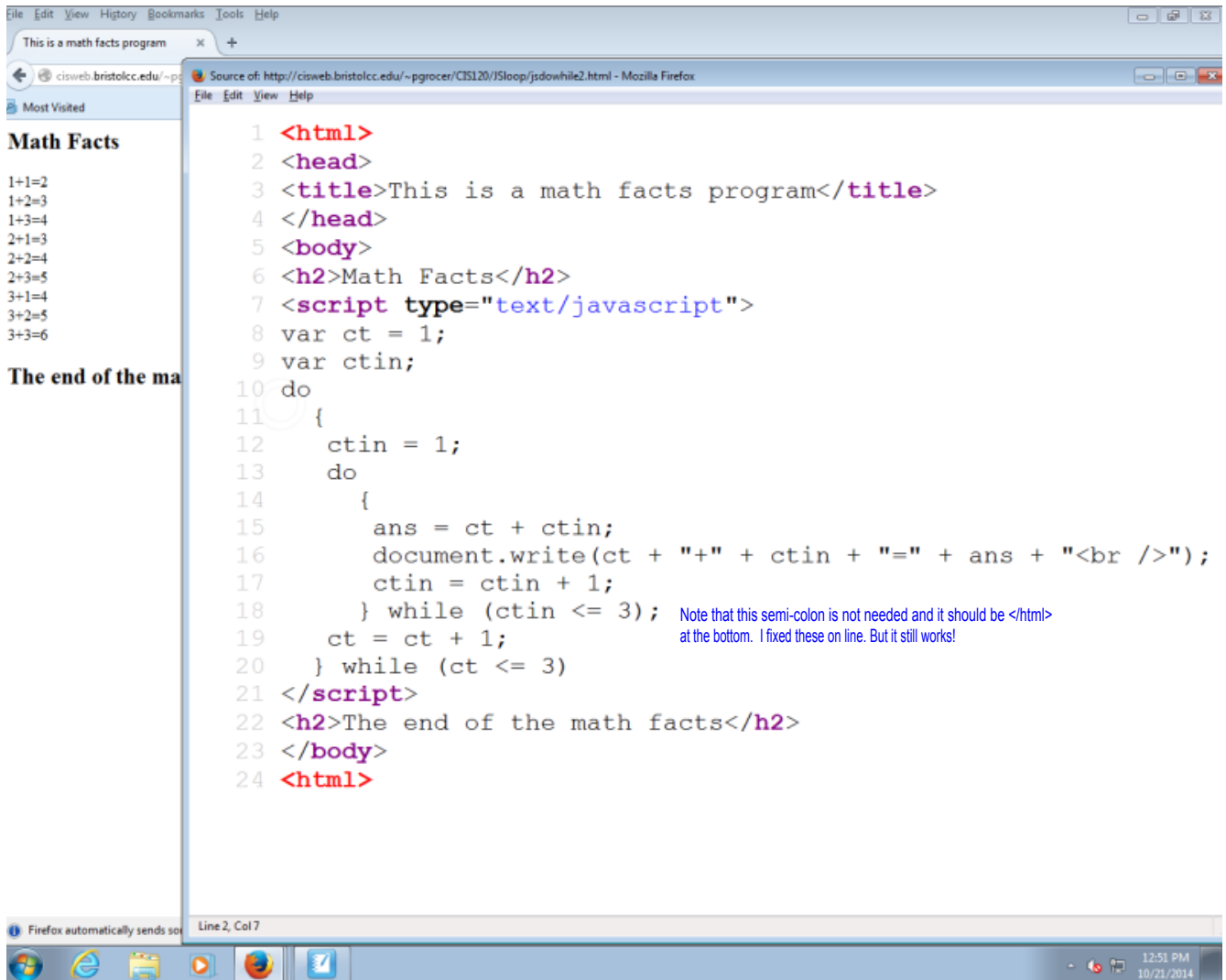
```
1 <html>
2 <head>
3 <title>This is a math facts program</title>
4 </head>
5 <body>
6 <h2>Math Facts</h2>
7 <script type="text/javascript">
8 var ct = 1;
9 var ctin;
10 while (ct <= 3)
11 {
12     ctin = 1;
13     while (ctin <= 3)
14     {
15         ans = ct + ctin;
16         document.write(ct + "+" + ctin + "=" + ans + "<br />");
17         ctin = ctin + 1;
18     }
19     ct = ct + 1;
20 }
21 </script>
22 <h2>The end of the math facts</h2>
23 </body>
24 </html>
```

Handwritten blue annotations on the code include "loop increment" with a circle around the inner loop's increment statement, and "drop down reset" with an arrow pointing to the `ctin = 1;` line. A text box on the right explains: "When I drop down from the outer loop to the inner loop I set the inner loop control to 1 before entering the inner loop. When I am executing the inner loop, I circle through it incrementing the control with each pass."

The screenshot shows a Mozilla Firefox browser window displaying a web page titled "This is a math facts program". The page content includes a list of math facts and a JavaScript loop. Handwritten blue annotations explain the code structure:

- Math Facts:** A list of equations (1+1=2, 1+2=3, 1+3=4, 2+1=3, 2+2=4, 2+3=5, 3+1=4, 3+2=5, 3+3=6) is annotated with "inner" and "Inne" (likely "inner") in blue, indicating the inner loop of the program.
- Loop Structure:** The JavaScript code is annotated with "loop increment" (pointing to the inner while loop), "dropdown reset" (pointing to the reset of the inner loop counter), and "ct" (pointing to the outer loop counter).
- Text:** The text "The end of the m" is partially visible on the left side of the page.

```
1 <html>
2 <head>
3 <title>This is a math facts program</title>
4 </head>
5 <body>
6 <h2>Math Facts</h2>
7 <script type="text/javascript">
8   var ct = 1;
9   var ctin;
10  while (ct <= 3)
11  {
12    ctin = 1;
13    while (ctin <= 3)
14    {
15      ans = ct + ctin;
16      document.write(ct + "+" + ctin + "=" + ans + "<br />");
17      ctin = ctin + 1;
18    }
19    ct = ct + 1;
20  }
21 </script>
22 <h2>The end of the math facts</h2>
23 </body>
24 </html>
```



```
1 <html>
2 <head>
3 <title>This is a math facts program</title>
4 </head>
5 <body>
6 <h2>Math Facts</h2>
7 <script type="text/javascript">
8 var ct = 1;
9 var ctin;
10 do
11 {
12     ctin = 1;
13     do
14     {
15         ans = ct + ctin;
16         document.write(ct + "+" + ctin + "=" + ans + "<br />");
17         ctin = ctin + 1;
18     } while (ctin <= 3);
19     ct = ct + 1;
20 } while (ct <= 3)
21 </script>
22 <h2>The end of the math facts</h2>
23 </body>
24 </html>
```

Note that this semi-colon is not needed and it should be </html> at the bottom. I fixed these on line. But it still works!

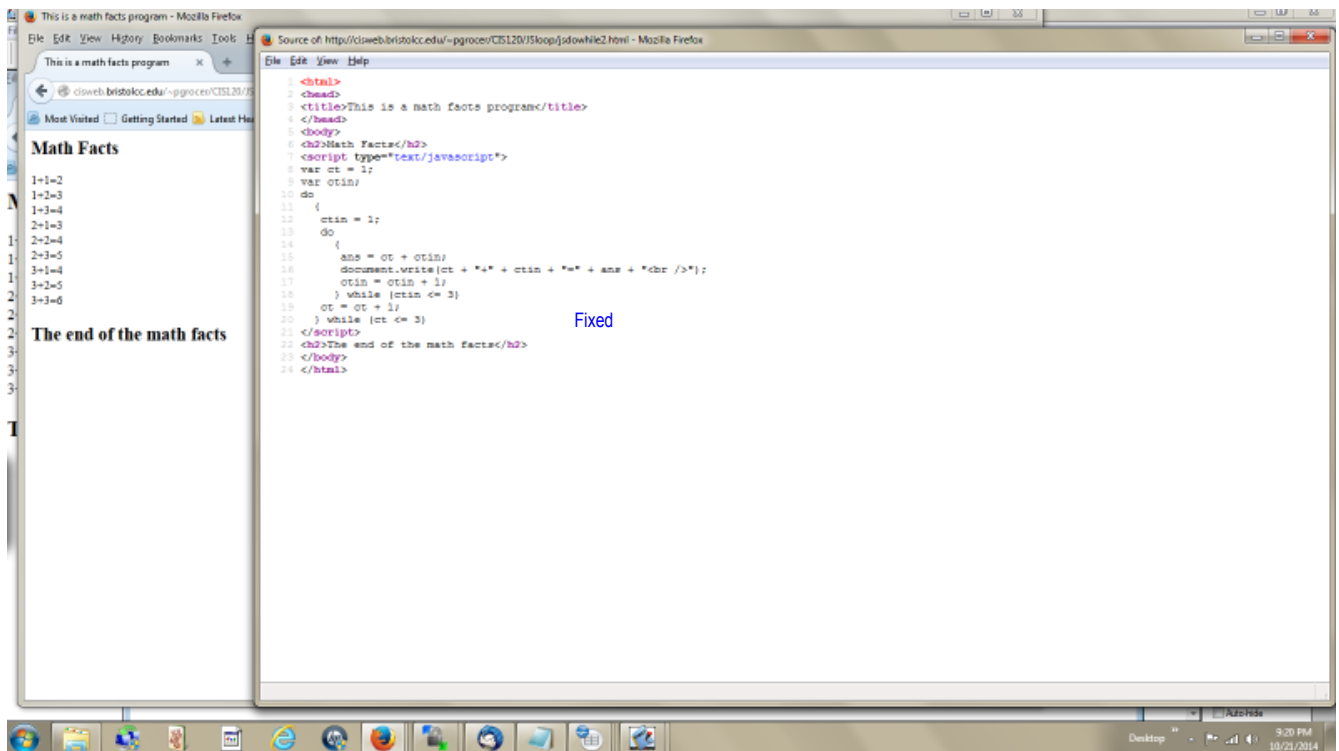
Firefox automatically sends so... Line 2, Col 7

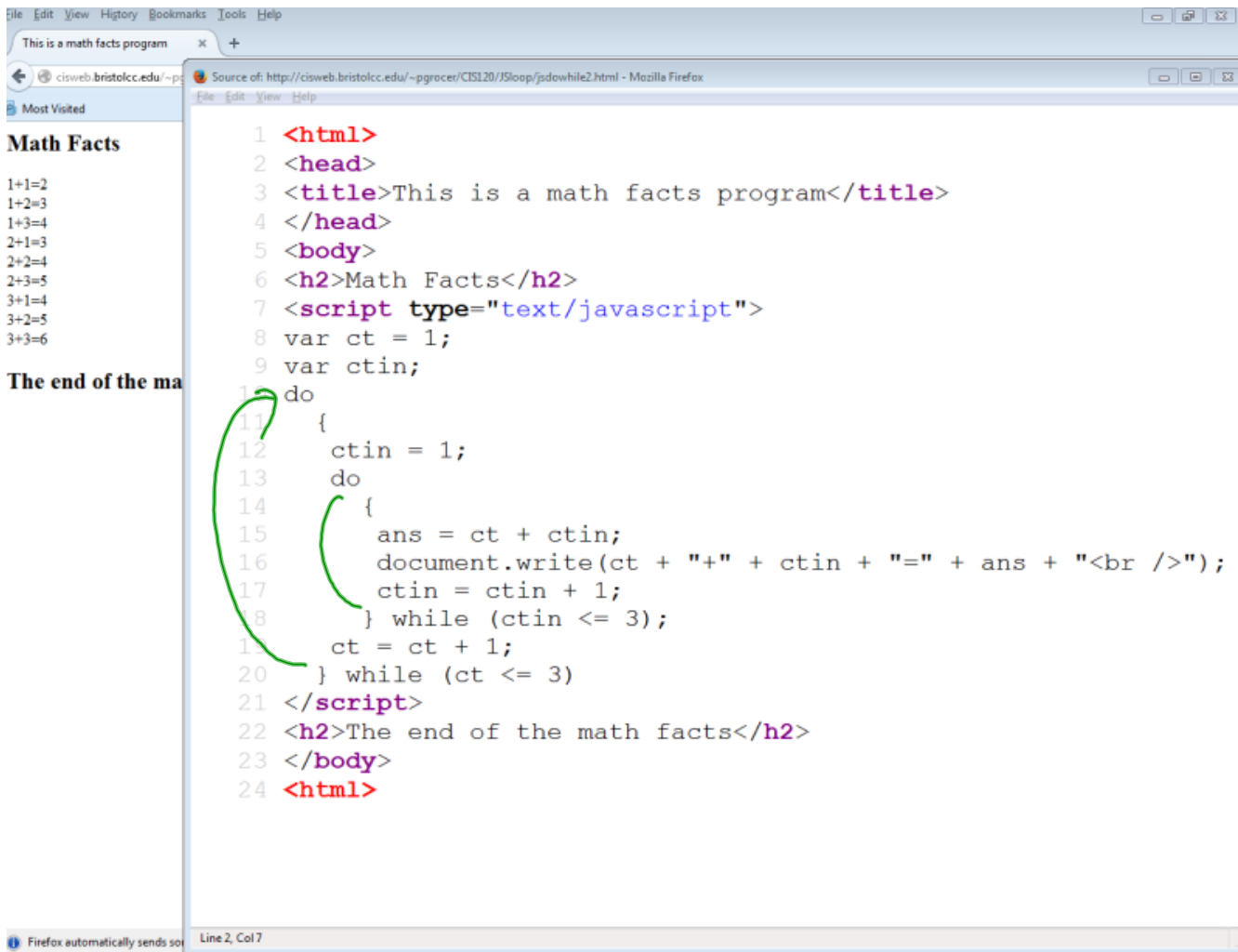
12:51 PM
10/21/2014

The screenshot shows a browser window with the source code of a page titled "This is a math facts program". The page content includes a list of math facts and a heading "The end of the math facts". The JavaScript code is as follows:

```
1 <html>
2 <head>
3 <title>This is a math facts program</title>
4 </head>
5 <body>
6 <h2>Math Facts</h2>
7 <script type="text/javascript">
8 var ct = 1;
9 var ctin;
10 do
11 {
12   ctin = 1;
13   do
14   {
15     ans = ct + ctin;
16     document.write(ct + "+" + ctin + "=" + ans + "<br />");
17     ctin = ctin + 1;
18   } while (ctin <= 3);
19   ct = ct + 1;
20 } while (ct <= 3)
21 </script>
22 <h2>The end of the math facts</h2>
23 </body>
24 </html>
```

A green circle highlights the inner loop structure, specifically the lines 13-18, which are nested within the outer loop (lines 10-20).





```
1 <html>
2 <head>
3 <title>This is a math facts program</title>
4 </head>
5 <body>
6 <h2>Math Facts</h2>
7 <script type="text/javascript">
8 var ct = 1;
9 var ctin;
10 do
11 {
12   ctin = 1;
13   do
14   {
15     ans = ct + ctin;
16     document.write(ct + "+" + ctin + "=" + ans + "<br />");
17     ctin = ctin + 1;
18   } while (ctin <= 3);
19   ct = ct + 1;
20 } while (ct <= 3)
21 </script>
22 <h2>The end of the math facts</h2>
23 </body>
24 </html>
```

Firefox automatically sends so Line 2, Col 7

The screenshot shows a Mozilla Firefox browser window with a single tab titled "This is a math facts program". The address bar shows the URL `http://cisweb.bristolcc.edu/~pgrocer/CIS120/JSloop/jsfor2.html`. The page content includes a list of math facts and a heading "The end of the".

Math Facts

- 1+1=2
- 1+2=3
- 1+3=4
- 2+1=3
- 2+2=4
- 2+3=5
- 3+1=4
- 3+2=5
- 3+3=6

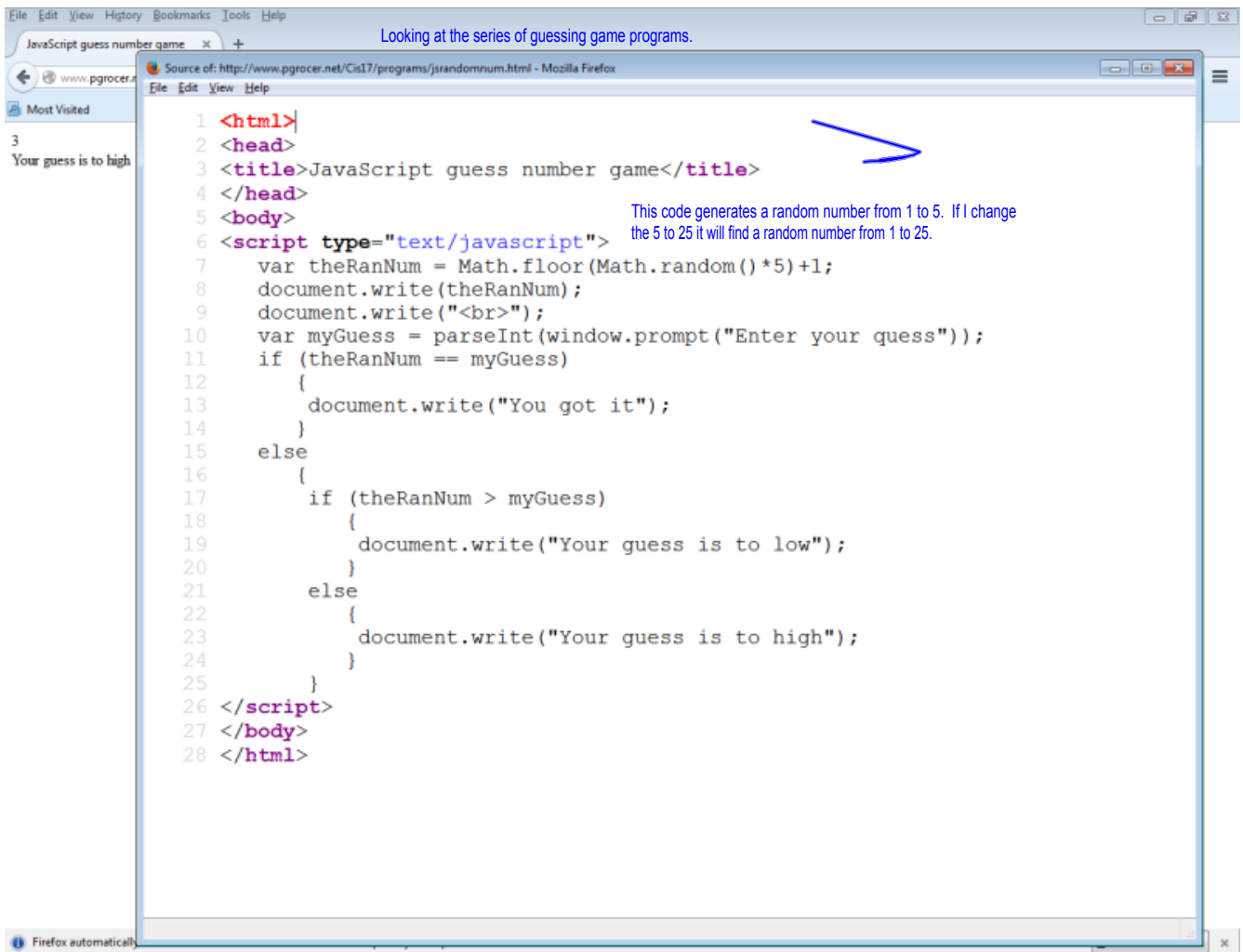
The end of the

The source code editor window shows the following HTML and JavaScript code:

```
1 <html>
2 <head>
3 <title>This is a math facts program</title>
4 </head>
5 <body>
6 <h2>Math Facts</h2>
7 <script type="text/javascript">
8   var i;
9   for (i=1; i<=3; i=i+1)
10    {
11      for (j = 1; j <= 3; j = j + 1)
12        {
13          ans = i + j;
14          document.write(i + " + " + j + " = " + ans + "<br />");
15        }
16    }
17 </script>
18 <h2>The end of the math facts</h2>
19 </body>
20 </html>
```

A comment in the code editor states: "The control on the outer loop is i and the control on the inner loop is j - again in the for the set, check and change are handled in the parenthesis."

The browser's status bar at the bottom shows the time as 12:54 PM on 10/21/2014.



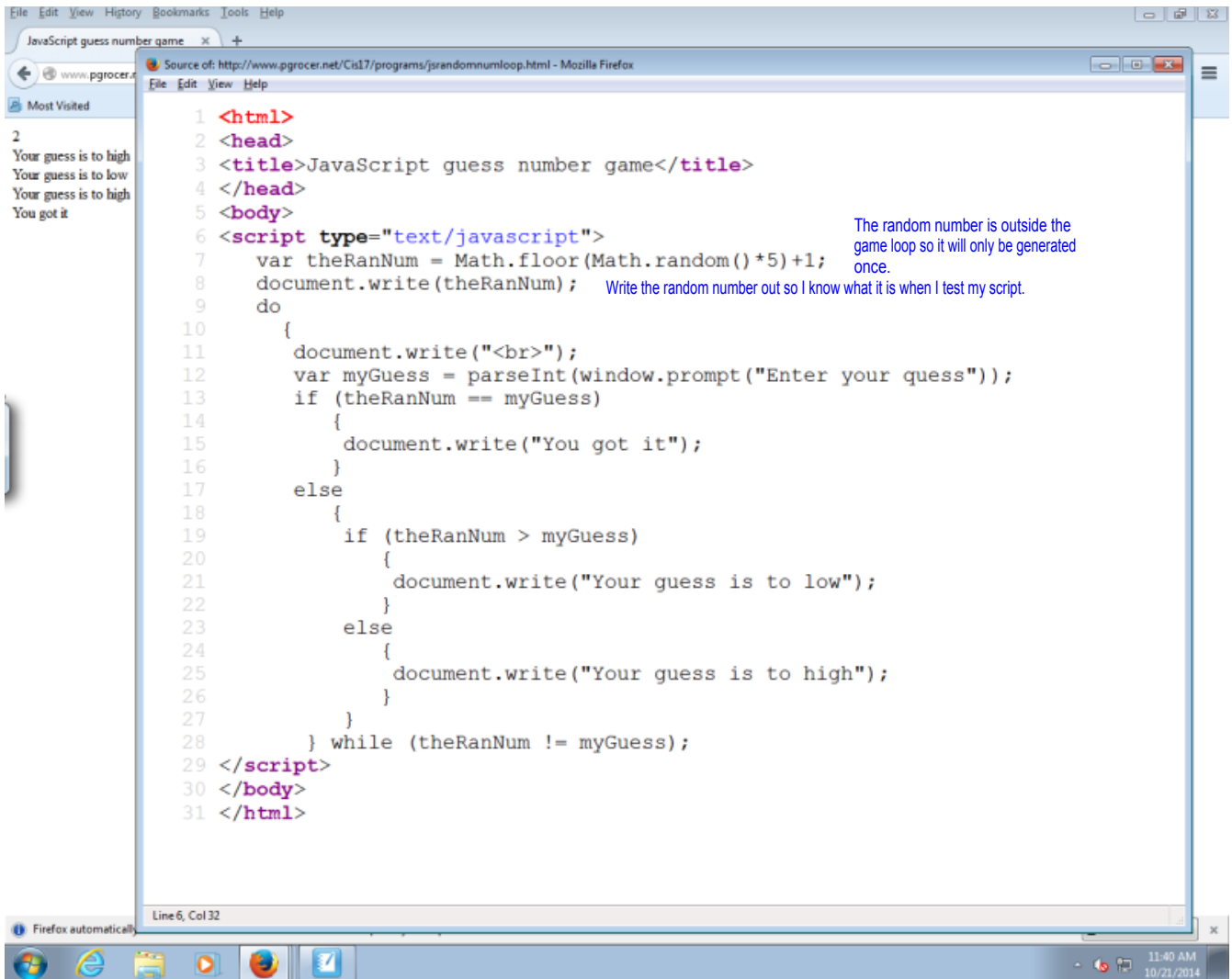
Looking at the series of guessing game programs.

```
1 <html>
2 <head>
3 <title>JavaScript guess number game</title>
4 </head>
5 <body>
6 <script type="text/javascript">
7     var theRanNum = Math.floor(Math.random()*5)+1;
8     document.write(theRanNum);
9     document.write("<br>");
10    var myGuess = parseInt(window.prompt("Enter your guess"));
11    if (theRanNum == myGuess)
12    {
13        document.write("You got it");
14    }
15    else
16    {
17        if (theRanNum > myGuess)
18        {
19            document.write("Your guess is to low");
20        }
21        else
22        {
23            document.write("Your guess is to high");
24        }
25    }
26 </script>
27 </body>
28 </html>
```

This code generates a random number from 1 to 5. If I change the 5 to 25 it will find a random number from 1 to 25.

The image shows a Firefox browser window with a source code editor for a JavaScript file. The code implements a simple number-guessing game. A flowchart is overlaid on the code, illustrating the program's logic. The flowchart starts with an oval labeled 'START', leading to a rectangle 'Ran Num'. This is followed by a parallelogram 'Guess'. A decision diamond 'Ran Num == Guess' branches into two paths: 'Y' (Yes) leading to a rectangle 'got it', and 'N' (No) leading to another decision diamond 'Ran Num > myGuess'. This second diamond branches into 'N' (No) leading to a rectangle 'high' and 'Y' (Yes) leading to a rectangle 'low'. Both 'high' and 'low' paths loop back to the 'Guess' input. The 'got it' path leads to an oval 'STOP'.

```
1 <html>
2 <head>
3 <title>JavaScript guess number game</title>
4 </head>
5 <body>
6 <script type="text/javascript">
7   var theRanNum = Math.floor(Math.random()*100+1);
8   document.write(theRanNum);
9   document.write("<br>");
10  var myGuess = parseInt(window.prompt("Enter your guess"));
11  if (theRanNum == myGuess)
12  {
13    document.write("You got it");
14  }
15  else
16  {
17    if (theRanNum > myGuess)
18    {
19      document.write("Your guess is to low");
20    }
21    else
22    {
23      document.write("Your guess is to high");
24    }
25  }
26 </script>
27 </body>
28 </html>
```



```
1 <html>
2 <head>
3 <title>JavaScript guess number game</title>
4 </head>
5 <body>
6 <script type="text/javascript">
7   var theRanNum = Math.floor(Math.random()*5)+1;
8   document.write(theRanNum);
9   do
10  {
11    document.write("<br>");
12    var myGuess = parseInt(window.prompt("Enter your guess"));
13    if (theRanNum == myGuess)
14    {
15      document.write("You got it");
16    }
17    else
18    {
19      if (theRanNum > myGuess)
20      {
21        document.write("Your guess is to low");
22      }
23      else
24      {
25        document.write("Your guess is to high");
26      }
27    }
28  } while (theRanNum != myGuess);
29 </script>
30 </body>
31 </html>
```

The random number is outside the game loop so it will only be generated once.

Write the random number out so I know what it is when I test my script.

Most Visited

2
Your guess is to high
Your guess is to low
Your guess is to high
You got it

Line 6, Col 32

Firefox automatically

11:40 AM
10/21/2014

JavaScript guess number

Source of: <http://www.pgrocer.net/Cis17/programs/jsrandomnumloop.html> - Mozilla Firefox

```
1 <html>
2 <head>
3 <title>JavaScript guess number game</title>
4 </head>
5 <body>
6 <script type="text/javascript">
7   var theRanNum = Math.floor(Math.random()*5)+1;
8   document.write(theRanNum);
9   do
10  {
11    document.write("<br>");
12    var myGuess = parseInt(window.prompt("Enter your guess"));
13    if (theRanNum == myGuess)
14    {
15      document.write("You got it");
16    }
17    else
18    {
19      if (theRanNum > myGuess)
20      {
21        document.write("Your guess is to low");
22      }
23      else
24      {
25        document.write("Your guess is to high");
26      }
27    }
28  } while (theRanNum != myGuess);
29 </script>
30 </body>
31 </html>
```

The script ends when the random number is equal to the guess. As long as they are not equal, the user will be given another chance to guess.

!= not equal

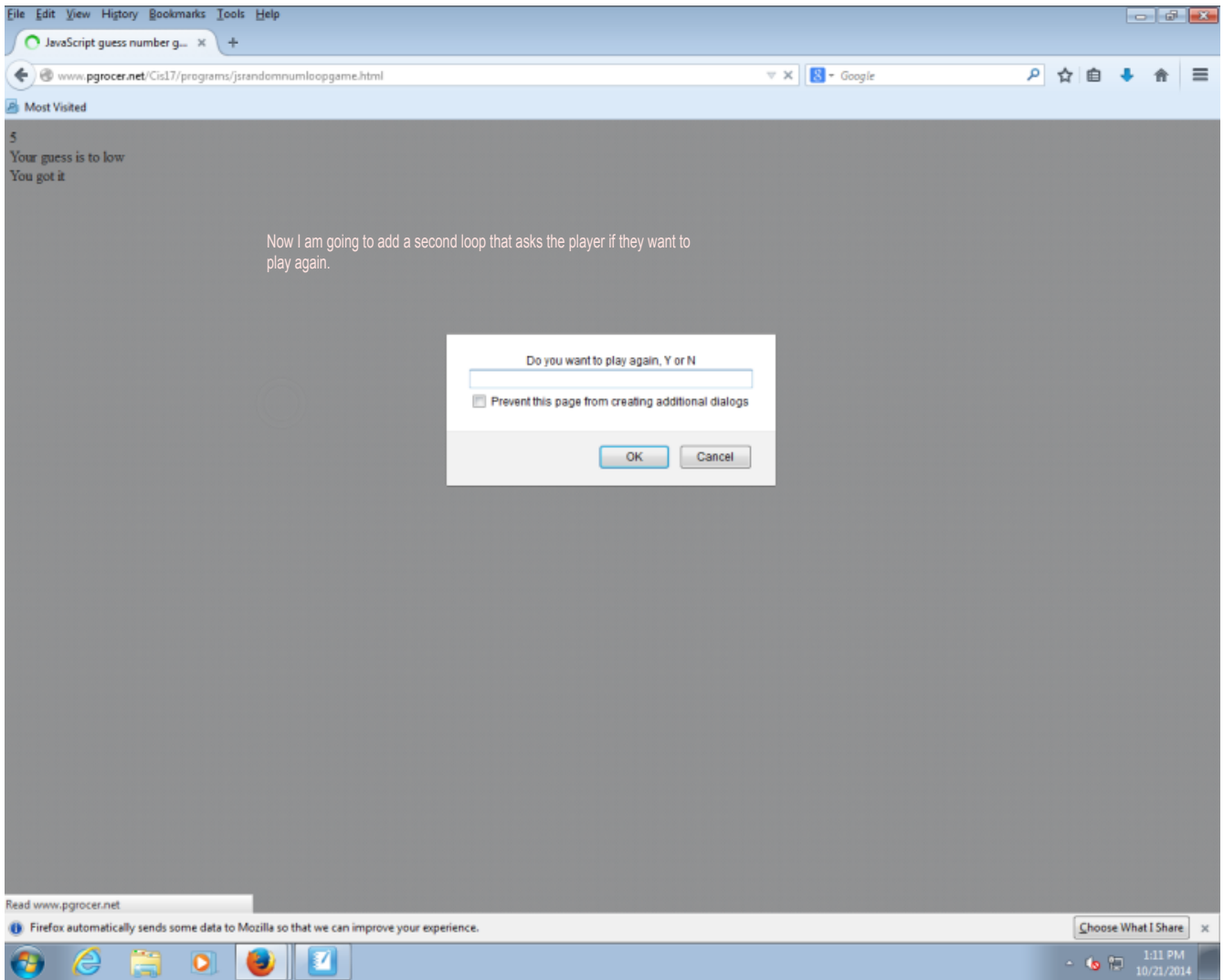
Line 15, Col 40

Firefox automatically sends some data to Mozilla so that we can improve your experience. Choose What I Share

The image shows a screenshot of a Mozilla Firefox browser window displaying a JavaScript program for a guess number game. The code is as follows:

```
1 <html>
2 <head>
3 <title>JavaScript guess number game</title>
4 </head>
5 <body>
6 <script type="text/javascript">
7   var theRanNum = Math.floor(Math.random()*5)+1;
8   document.write(theRanNum);
9   do
10  {
11    document.write("<br>");
12    var myGuess = parseInt(window.prompt("Enter your guess"));
13    if (theRanNum == myGuess)
14    {
15      document.write("You got it");
16    }
17    else
18    {
19      if (theRanNum > myGuess)
20      {
21        document.write("Your guess is to low");
22      }
23      else
24      {
25        document.write("Your guess is to high");
26      }
27    }
28  } while (theRanNum != myGuess);
29 </script>
30 </body>
31 </html>
```

Overlaid on the code is a hand-drawn flowchart in blue ink. The flowchart starts with an oval labeled "START", followed by a rectangle labeled "Ran num". It then leads to a parallelogram labeled "Guess". A decision diamond contains "Ran num == Gues". The "Y" path from this diamond leads to a rectangle labeled "Got it", which then leads to an oval labeled "STOP". The "N" path from the diamond leads to a decision diamond with "Ran num > Gues". The "Y" path from this diamond leads to a rectangle labeled "low", which then loops back to the "Guess" input. The "N" path from this diamond leads to a rectangle labeled "high", which also loops back to the "Guess" input. A second decision diamond, labeled "Ran num != Gues", is located below the "low" and "high" boxes. The "Y" path from this diamond loops back to the "Guess" input, and the "N" path leads to the "STOP" oval.



```

1 <html>
2 <head>
3 <title>JavaScript guess number game</title>
4 </head>
5 <body>
6 <script type="text/javascript">
7   var playAgain = "Y";
8   do
9     {
10      var theRanNum = Math.floor(Math.random()*5)+1;
11      document.write (theRanNum);
12      do
13        {
14          document.write("<br>");
15          var myGuess = parseInt(window.prompt("Enter your guess"));
16          if (theRanNum == myGuess)
17            {
18              document.write("You got it");
19            }
20          else
21            {
22              if (theRanNum > myGuess)
23                {
24                  document.write("Your guess is to low");
25                }
26              else
27                {
28                  document.write("Your guess is to high");
29                }
30            }
31          } while (theRanNum != myGuess);
32          playAgain = window.prompt("Do you want to play again, Y or N");
33          document.write("<br>");
34          } while (playAgain != "N");
35 </script>
36 </body>
37 </html>

```

Note that the random number is generated inside the outer loop because when I start a new game, I want a new random number.

Again, this semi-colon is not needed and I recommend against it. Fixed on line.

Another semi-colon to eliminate As long as the player enters anything but N, the game will be replayed.

Play again
Game

The screenshot shows a Firefox browser window displaying the w3schools.com website. The address bar shows the URL `www.w3schools.com/jsref/jsref_touppercase.asp`. The page content includes:

- Navigation:** HOME, HTML, CSS, JAVASCRIPT, SQL, PHP, JQUERY, ANGULAR, BOOTSTRAP, XML, ASP.NET, MORE..., REFERENCES, EXAMPLES, FORUM, ABOUT.
- Left Sidebar:**
 - JavaScript Reference**
 - Overview
 - JavaScript
 - JS String
 - JS Number
 - JS Operators
 - JS Statements
 - JS Math
 - JS Date
 - JS Array
 - JS Boolean
 - JS RegExp
 - JS Global
 - Browser BOM**
 - Window
 - Navigator
 - Screen
 - History
 - Location
 - HTML DOM**
 - DOM Document
 - DOM Elements
 - DOM Attributes
 - DOM Events
 - HTML Objects**
 - <a>
 - <abbr>
 - <address>
 - <area>
 - <article>
 - <aside>
 - <audio>
 - <h1>
- Main Content:**
 - Advertisement: "Advertise locally or globally. Get a \$75 credit when you spend your first \$25."
 - Section: **JavaScript String toUpperCase() Method**
 - Sub-section: **JavaScript String Reference**
 - Example:**
 - Convert the string to uppercase letters:

```
var str = "Hello World!";
var res = str.toUpperCase();
```
 - The result of `res` will be: HELLO WORLD!
 - Code snippet: `playAgain = prompt(...); playAgain = playAgain.toUpperCase();`
 - Button: "Try it yourself >>>"
 - Definition and Usage:**
 - The `toUpperCase()` method converts a string to uppercase letters.
 - Note:** The `toUpperCase()` method does not change the original string.
 - Tip:** Use the `toLowerCase()` method to convert a string to lowercase letters.
 - Browser Support:**

Method	Chrome	Edge	Firefox	Internet Explorer	Safari
<code>toUpperCase()</code>	Yes	Yes	Yes	Yes	Yes
- Right Sidebar:**
 - Search: "w3schools.com"
 - Language: "Select Language | v"
 - WEB HOSTING: "UK Reseller Hosting"
 - WEB BUILDING: "XML Editor - Free Trial! FREE Website BUILDER Free HTML5 Templates"
 - W3SCHOOLS EXAMS: "HTML, CSS, JavaScript, PHP, JQuery, XML, and ASP Certifications"
 - SHARE THIS PAGE: "Like"
 - AdChoices: "GET TWO SAFE DRIVING BONUS CHECKS A YEAR ONLY FROM ALLSTATE"

The screenshot shows a Firefox browser window displaying a JavaScript guess number game. The code is as follows:

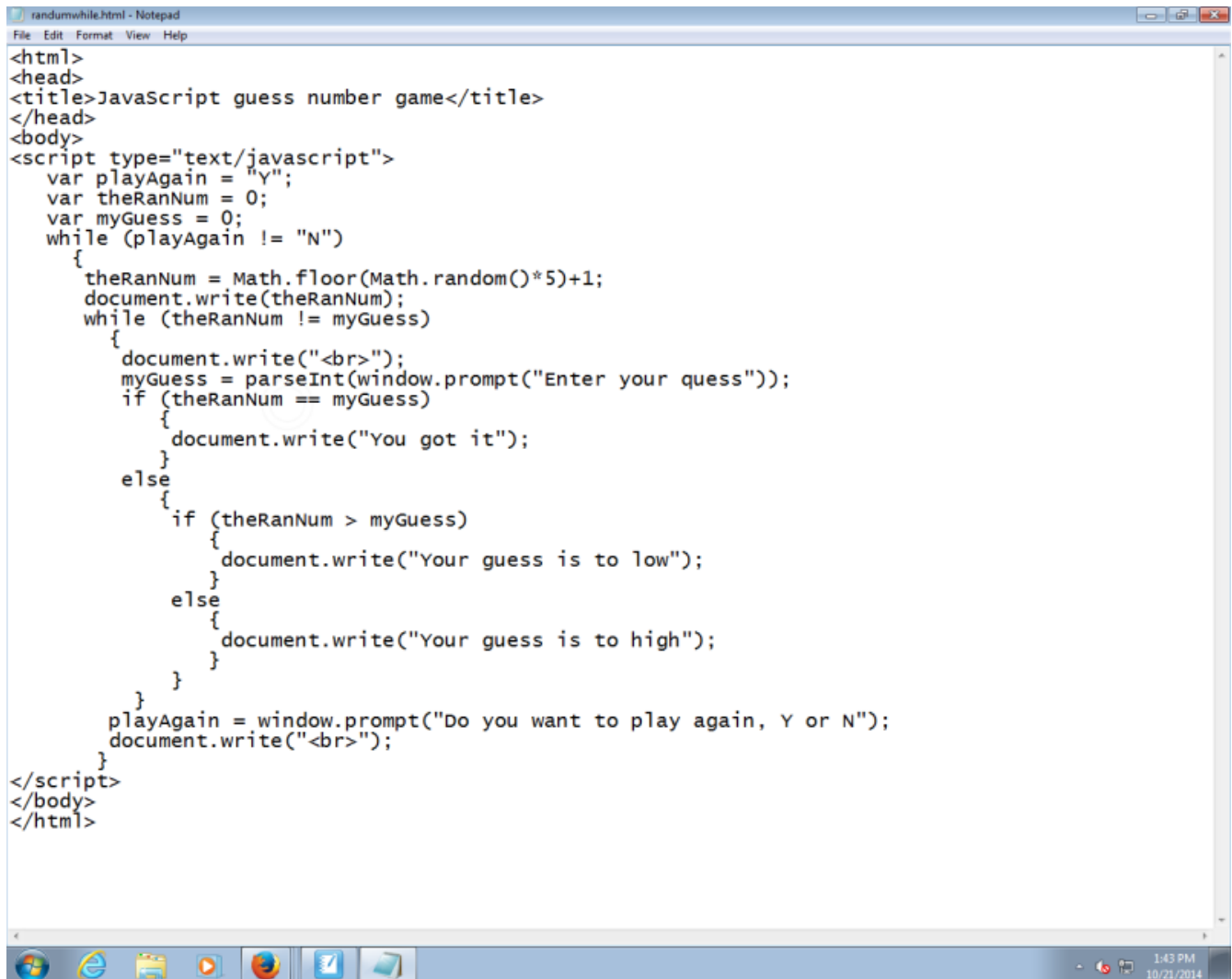
```
1 <html>
2 <head>
3 <title>JavaScript guess number game</title>
4 </head>
5 <body>
6 <script type="text/javascript">
7   var playAgain = "Y";
8   do
9   {
10    var theRanNum = Math.floor(Math.random()*5)+1;
11    document.write(theRanNum);
12    do
13    {
14      document.write("<br>");
15      var myGuess = parseInt(window.prompt("Enter your guess"));
16      if (theRanNum == myGuess)
17      {
18        document.write("You got it");
19      }
20      else
21      {
22        if (theRanNum > myGuess)
23        {
24          document.write("Your guess is to low");
25        }
26        else
27        {
28          document.write("Your guess is to high");
29        }
30      }
31    } while (theRanNum != myGuess);
32    playAgain = window.prompt("Do you want to play again: Y or N");
33    document.write("<br>");
34  } while (playAgain != "N");
35 </script>
36 </body>
37 </html>
```

Overlaid on the code is a hand-drawn flowchart in blue ink. The flowchart starts with an oval labeled "START", leading to a rounded rectangle labeled "RanNum". From "RanNum", an arrow points to a parallelogram labeled "Guess". Below "Guess" is a diamond-shaped decision node labeled "=". If the answer is "Y", an arrow points to a parallelogram labeled "Got it". If the answer is "N", an arrow points to a diamond-shaped decision node labeled "RanNum > myGuess?". If "Y", an arrow points to a parallelogram labeled "low". If "N", an arrow points to a parallelogram labeled "high". Both "low" and "high" arrows point back to the "Guess" node. Below the "low" and "high" nodes is another diamond-shaped decision node labeled "Do you want to play again?". If "Y", an arrow points to a rounded rectangle labeled "Play Again". If "N", an arrow points to a parallelogram labeled "!!". The "Play Again" node loops back to the "RanNum" node. The "!!" node also loops back to the "RanNum" node.

```
1 <html>
2 <head>
3 <title>JavaScript guess number game</title>
4 </head>
5 <body>
6 <script type="text/javascript">
7   var playAgain = "Y";
8   do
9   {
10    var theRanNum = Math.floor(Math.random()*5)+1;
11    document.write(theRanNum);
12    do
13    {
14      document.write("<br>");
15      var myGuess = parseInt(window.prompt("Enter your guess"));
16      if (theRanNum == myGuess)
17      {
18        document.write("You got it");
19      }
20      else
21      {
22        if (theRanNum > myGuess)
23        {
24          document.write("Your guess is to low");
25        }
26        else
27        {
28          document.write("Your guess is to high");
29        }
30      }
31    } while (theRanNum != myGuess);
32    playAgain = window.prompt("Do you want to play again, Y or N");
33    document.write("<br>");
34  } while (playAgain != "N");
35 </script>
36 </body>
37 </html>
```

Next I asked the class to change to a while loop instead of a do..while with the condition at the end.

```
randomwhile.html - Notepad
File Edit Format View Help
<html>
<head>
<title>JavaScript guess number game</title>
</head>
<body>
<script type="text/javascript">
  var playAgain = "Y";
  var theRanNum = 0;
  var myGuess = 0;
  while (playAgain != "N")
  {
    theRanNum = Math.floor(Math.random()*5)+1;
    document.write(theRanNum);
    while (theRanNum != myGuess)
    {
      document.write("<br>");
      myGuess = parseInt(window.prompt("Enter your guess"));
      if (theRanNum == myGuess)
      {
        document.write("You got it");
      }
      else
      {
        if (theRanNum > myGuess)
        {
          document.write("Your guess is to low");
        }
        else
        {
          document.write("Your guess is to high");
        }
      }
    }
    playAgain = window.prompt("Do you want to play again, Y or N");
    document.write("<br>");
  }
</script>
</body>
</html>
```



The screenshot shows a Notepad window titled "randomwhile.html - Notepad" with a menu bar (File, Edit, Format, View, Help). The main text area contains HTML and JavaScript code for a "JavaScript guess number game". The code uses a while loop to generate a random number (1-5) and a nested while loop to prompt the user for a guess. Feedback messages are written to the document based on the guess's accuracy. The game ends when the user chooses not to play again (Y or N). The Windows taskbar at the bottom shows the time as 1:43 PM on 10/21/2014.

