

JavaScript 5d Loops

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Different Kinds of Loops

- Loops are handy for **iterating** (repeating) the same piece of code with different value each time.
- **Mostly just like** loops in **C**.
- **for** - loops through a block of code a number of times
- **for/in** - loops through the properties of an object
- **while** - loops through a block of code while a specified condition is true
- **do/while** - also loops through a block of code while a specified condition is true



For-Loop

- https://www.w3schools.com/js/js_loop_for.asp
- Just like C.

```
for (statement 1; statement 2; statement 3) {  
    code block to be executed  
}
```

- **Statement 1** is executed before any loops starts.
- **Statement 2** determines whether to continue the loop.
- **Statement 3** is executed at the end of each loop.



For-Loop

Just like C

- Sets up $i=0$ before any iteration starts.
- Iterate one more time if $i < 5$.
- Increase i by 1 at the end of each iteration.

```
for (i = 0; i < 5; i++) {  
    text += "The number is " + i + "<br>";  
}
```

For-Loop

- We use a loop to create the text, and then use innerHTML to show the text.

```
<!DOCTYPE html>
<html>
<body>

<h2>JavaScript Loops</h2>

<p id="demo"></p>

<script>
var text = "";
var i;
for (i = 0; i < 5; i++) {
    text += "The number is " + i + "<br>";
}
document.getElementById("demo").innerHTML = text;
</script>

</body>
</html>
```

5d Loops_samples\
forLoop1.html

JavaScript Loops

The number is 0
The number is 1
The number is 2
The number is 3
The number is 4

The For Loop

The `for` statement creates a loop with 3 optional expressions:

```
for (expression 1; expression 2; expression 3) {
    // code block to be executed
}
```

- JS Comparisons
- JS If Else
- JS Switch
- JS Loop For
- JS Loop For In
- JS Loop For Of
- JS Loop While
- JS Break



Initialization

Just like C

- We can initialize many values, separated by commas:

```
for (i = 0, len = cars.length, text = ""; i < len; i++) {  
    text += cars[i] + "<br>";  
}
```

- Initialization can be null (empty) if there is nothing to initialize.
 - See next slide



Condition to keep looping

Just like C

- Condition for continuing the loop.
 - If true, iterate one more time.
 - If false, exit the loop.
- If the condition is **null**, the value is assume to be **true**.
 - Need a **break** statement inside the loop to avoid an infinite loop that would crash your browser.
 - Example for fire alarm

```
for ( ; ; ) {  
    CheckFireAlarm(alarm);  
    if (alarm) break;  
}
```

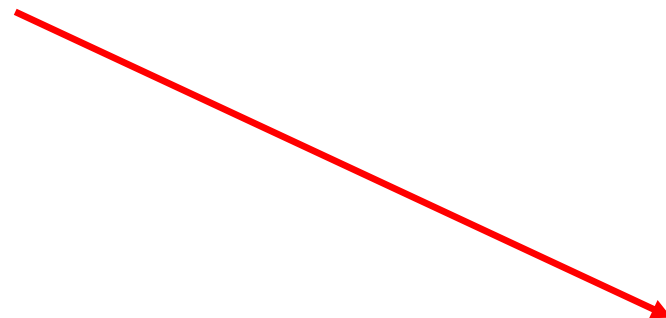


Update at end of each iteration

Just like C

- Executed after each iteration, to update the local variables
 - E.g. after each iteration, increase *i* by 1.

```
for (i = 0, len = cars.length, text = ""; i < len; i++) {  
    text += cars[i] + "<br>";  
}
```





For-loops through arrays

- Arrays are used for storing multiple values in a variable
 - More on arrays in the next topic.
- Instead of using 3 variables, we can use one array literal

```
var car1 = "Saab";  
var car2 = "Volvo";  
var car3 = "BMW";
```

```
var cars = ["Saab", "Volvo", "BMW"];
```



For loops through arrays

- Instead of

```
text += cars[0] + "<br>";  
text += cars[1] + "<br>";  
text += cars[2] + "<br>";  
text += cars[3] + "<br>";  
text += cars[4] + "<br>";  
text += cars[5] + "<br>";
```

- We can use

```
var i;  
for (i = 0; i < cars.length; i++) {  
    text += cars[i] + "<br>";  
}
```

https://www.w3schools.com/js/tryit.asp?filename=tryjs_loop_for

6a Loops_samples\forLoop3.html

Another Example

1. BMW
2. Volvo
3. Saab
4. Ford

https://www.w3schools.com/js/tryit.asp?filename=tryjs_loop_for

6a Loops_samples\forLoop2.html

```
<html>
<body>

<p id="demo"></p>

<script>
var cars = ["BMW", "Volvo", "Saab", "Ford"];

var i = 0;
var len = cars.length;
var text = "<ol>";<!-- creates an ordered list -->

for (; i < len; ) {
    text += "<li>" + cars[i] + "</li>";
    i++;
}
text += "<ol>";<!-- closing tag of ordered list -->
document.getElementById("demo").innerHTML = text;
</script>

</body>
</html>
```



The For/In Loop

```
<h2>JavaScript Loops</h2>
```

```
<p id="demo"></p>
```

```
<script>
```

```
var txt = "";
```

```
var person = {fname:"John", lname:"Doe", age:25};
```

```
var x;
```

```
for (x in person) {  
    txt += person[x] + " ";  
}
```

```
document.getElementById("demo").innerHTML = txt;
```

```
</script>
```

- The JavaScript for/in statement loops through the properties of an object.
 - https://www.w3schools.com/js/js_loop_forin.asp

JavaScript Loops

John Doe 25

https://www.w3schools.com/js/tryit.asp?filename=tryjs_object_for_in
6a Loops_samples\forInLoop.html



While Loop

Just like C

- The **while loop** loops through a block of code as long as the specified condition is true.
- https://www.w3schools.com/js/js_loop_while.asp

```
while (condition) {  
    code block to be executed  
}
```

```
while (i < 10) {  
    text += "<br>The number is " + i;  
    i++;  
}
```



While Loop

JavaScript while

The number is 0
The number is 1
The number is 2
The number is 3
The number is 4
The number is 5
The number is 6
The number is 7
The number is 8
The number is 9

https://www.w3schools.com/js/tryit.asp?filename=tryjs_while
6a Loops_samples\whileLoop.html

```
<!DOCTYPE html>
<html>
<body>

<h2>JavaScript while</h2>

<p id="demo"></p>

<script>
var text = "";
var i = 0;
while (i < 10) {
    text += "<br>The number is " + i;
    i++;
}
document.getElementById("demo").innerHTML = text;
</script>

</body>
</html>
```



Do/While Loop

Just like C

- The do/while loop is a variant of the while loop.
- This loop will execute the code block once, then checking if the condition is true.
- If the condition is true, repeat the loop.

```
do {  
    code block to be executed  
}  
while (condition);
```

```
do {  
    text += "The number is " + i;  
    i++;  
}  
while (i < 10);
```



Do/While Loop

JavaScript do ... while

The number is 0
The number is 1
The number is 2
The number is 3
The number is 4
The number is 5
The number is 6
The number is 7
The number is 8
The number is 9

https://www.w3schools.com/js/tryit.asp?filename=tryjs_dowhile

6a Loops_samples\doWhileLoop.html

```
<h2>JavaScript do ... while</h2>

<p id="demo"></p>

<script>
var text = ""
var i = 0;

do {
    text += "<br>The number is " + i;
    i++;
}
while (i < 10);

document.getElementById("demo").innerHTML = text;
</script>
```

- The loop will always be executed at least once.



Class Exercise: Loop1

Loop Exercise

Number	Number x 10	Number ^ 2
1	10	1
2	20	4
3	30	9
4	40	16
5	50	25
6	60	36
7	70	49
8	80	64
9	90	81
10	100	100

- Download 5d_Loop1_TimesTable.html.
- Fill in the missing loop to create this table.



Class Exercise: Loop2

Optional: Do Loop2 if you finished other exercises and have time.

- Create these tables.
- There are many ways to do this.
 - Try to do it in the simplest way.
 - I.e. in minimum amount of code.
 - It's possible to do it with one loop.

Loop Exercise

Number	Number x 10	Number ^ 2
1	10	1
2	20	4
3	30	9
4	40	16
5	50	25

Number	Number x 10	Number ^ 2
6	60	36
7	70	49
8	80	64
9	90	81
10	100	100

Number	Number x 10	Number ^ 2
11	110	121
12	120	144
13	130	169
14	140	196
15	150	225

Number	Number x 10	Number ^ 2
16	160	256
17	170	289

Radio Button Array

```
<input type="radio" name="gender" value="male" checked> Male<br>
<input type="radio" name="gender" value="female"> Female<br>
<input type="radio" name="gender" value="other"> Other<br><br>
<input type="submit" onclick="radioButton()">
<script>
function radioButton(){
    var radios = document.getElementsByName('gender');

    for (var i = 0, length = radios.length; i < length; i++) {
        if (radios[i].checked) {
            // do whatever you want with the checked radio
            alert(radios[i].value);

            // only one radio can be logically checked, don't check the rest
            break;
        }
    }
}
```

- Can make radio buttons into an array.

6a Loops_samples\
radioLoop.html



Radio Button Array

```
<input type="radio" name="gender" value="male" checked> Male<br>  
<input type="radio" name="gender" value="female"> Female<br>  
<input type="radio" name="gender" value="other"> Other<br><br>  
<input type="submit" onclick="radioButton()">
```

- Radio button “gender”, made into the array radios
 - See next slide.



Radio Button Array

```
<script>
function radioButton(){
    var radios = document.getElementsByName('gender');

    for (var i = 0, length = radios.length; i < length; i++) {
        if (radios[i].checked) {
            // do whatever you want with the checked radio
            alert(radios[i].value);

            // only one radio can be logically checked, don't check the rest
            break;
        }
    }
}
```

6a Loops_samples\
radioLoop.html



Radio Button Array

Radio Buttons

The **input type="radio"** defines a radio button:

- ☒ Male
- ☐ Female
- ☐ Other

Submit

- After clicking “Submit”, get a pop-up window.

Radio Buttons

The **input type="radio"**

- ☒ Male
- ☐ Female
- ☐ Other

Submit

This page says

male

OK

6a Loops_samples\
radioLoop.html