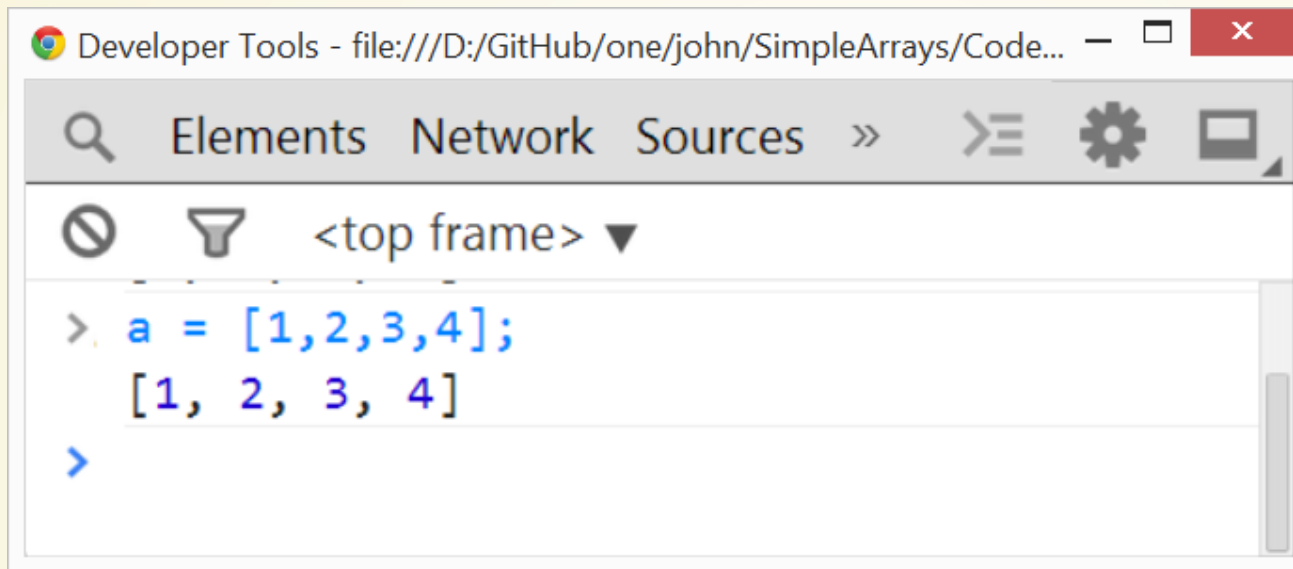


# JAVASCRIPT ARRAYS



The screenshot shows the Chrome Developer Tools console. The top bar indicates the file path: `file:///D:/GitHub/one/john/SimpleArrays/Code...`. The console has tabs for `Elements`, `Network`, and `Sources`. Below the tabs, there's a filter icon, a funnel icon, and the text `<top frame>` with a dropdown arrow. The console log shows two entries: a JavaScript statement `a = [1,2,3,4];` and the resulting array `[1, 2, 3, 4]`. The array elements are highlighted in blue. A third entry, a prompt character `>`, is visible on the next line.

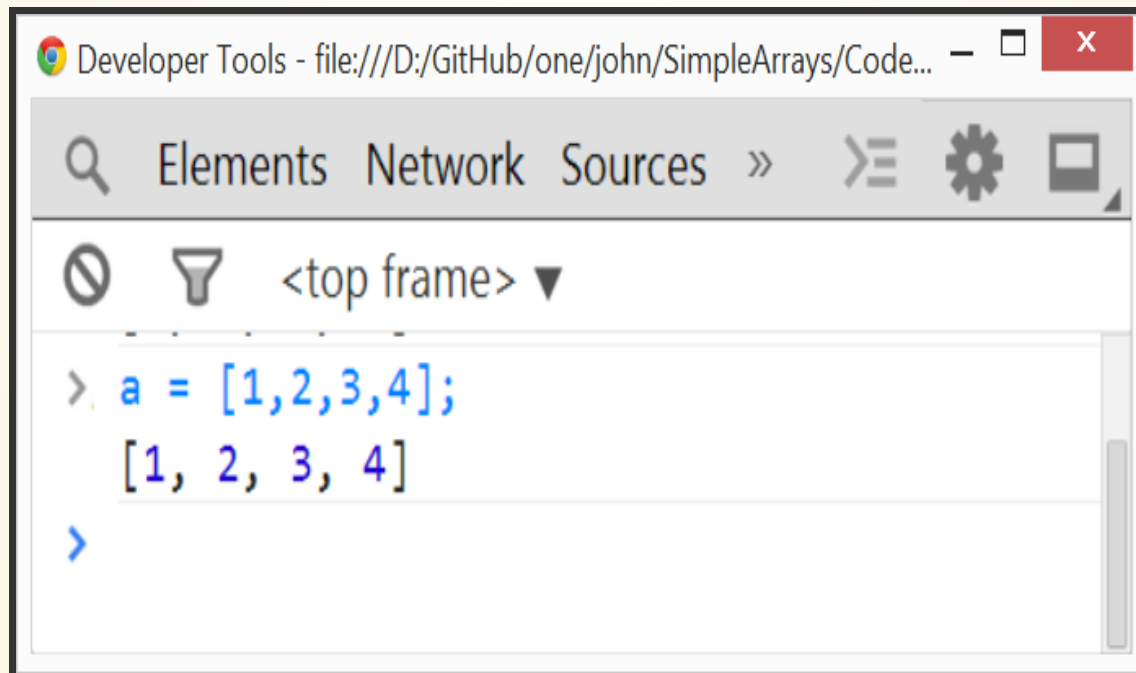
```
> a = [1,2,3,4];  
[1, 2, 3, 4]  
>
```

# INTEGER ARRAYS

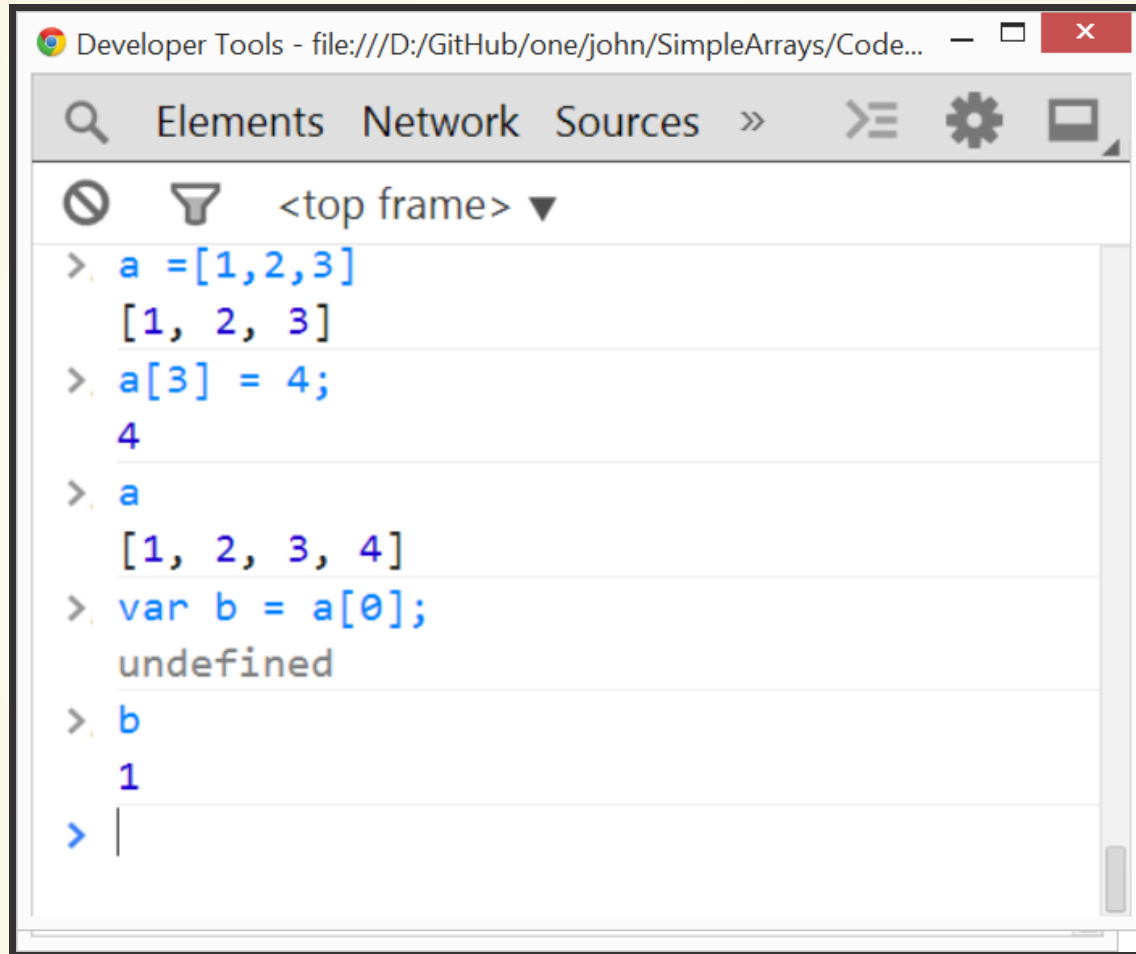
Follow along yourself in the Chrome Console.

Arrays in Javascript can store any kind of object eg numbers, strings etc. Here we will just store integers for compactness. We will demonstrate only the most common commands we will use.

In a later lesson we will come back and discuss arrays in much more detail.



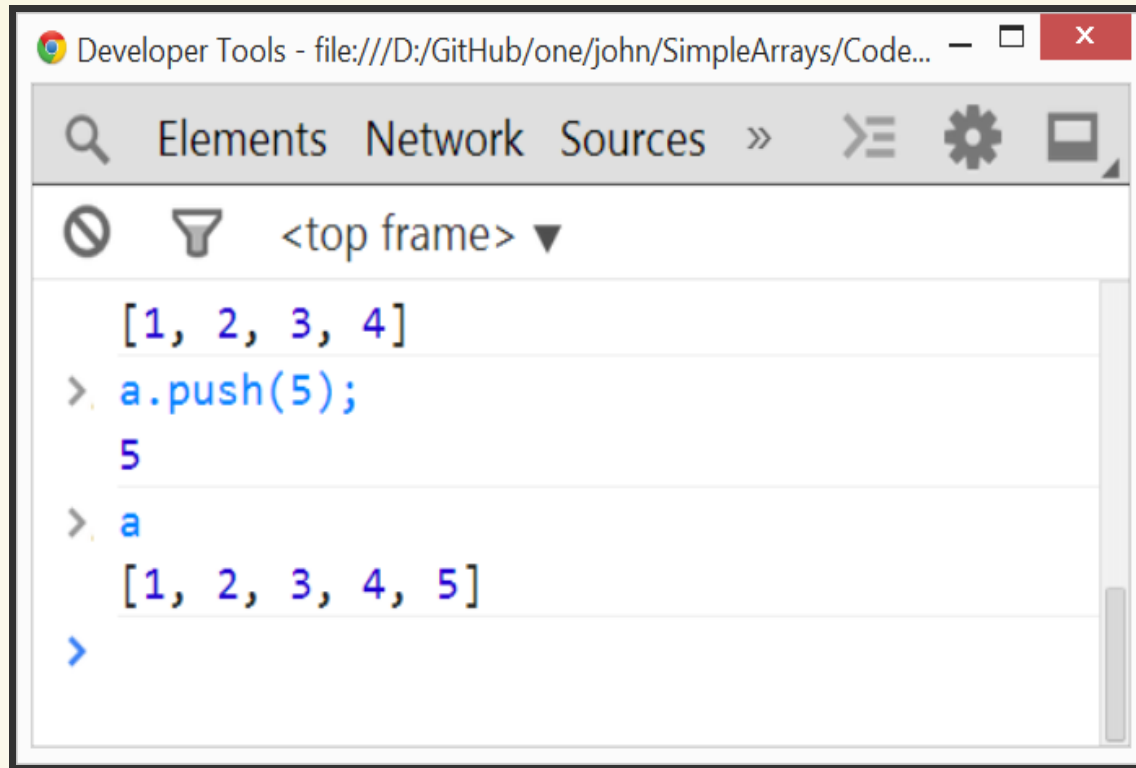
Arrays are 'zero' based so the first slot is a[0], then a[1] etc. If there are N slots then the last slot is a[N-1]



The screenshot shows a web browser window with the title "Developer Tools - file:///D:/GitHub/one/john/SimpleArrays/Code...". The "Elements" tab is selected in the top bar. Below the tab bar, there is a filter icon, a funnel icon, and a dropdown menu showing "<top frame>". The console area displays the following JavaScript code and its output:

```
> a = [1, 2, 3]
[1, 2, 3]
> a[3] = 4;
4
> a
[1, 2, 3, 4]
> var b = a[0];
undefined
> b
1
> |
```

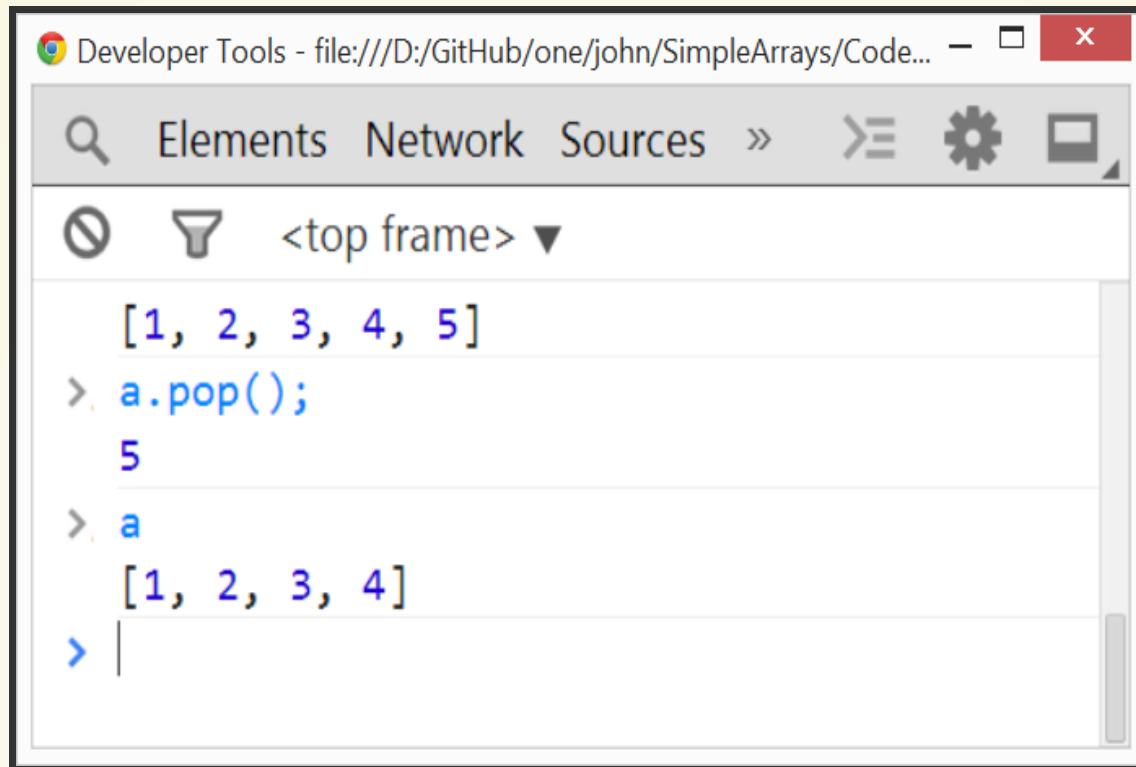
'push' a number onto the end of an array. Increases array length.



The screenshot shows the Chrome Developer Tools console. The top bar indicates the file path: file:///D:/GitHub/one/john/SimpleArrays/Code... The console has tabs for Elements, Network, and Sources. The console output shows the following sequence of commands and results:

```
<top frame> ▼  
[1, 2, 3, 4]  
> a.push(5);  
5  
> a  
[1, 2, 3, 4, 5]  
>
```

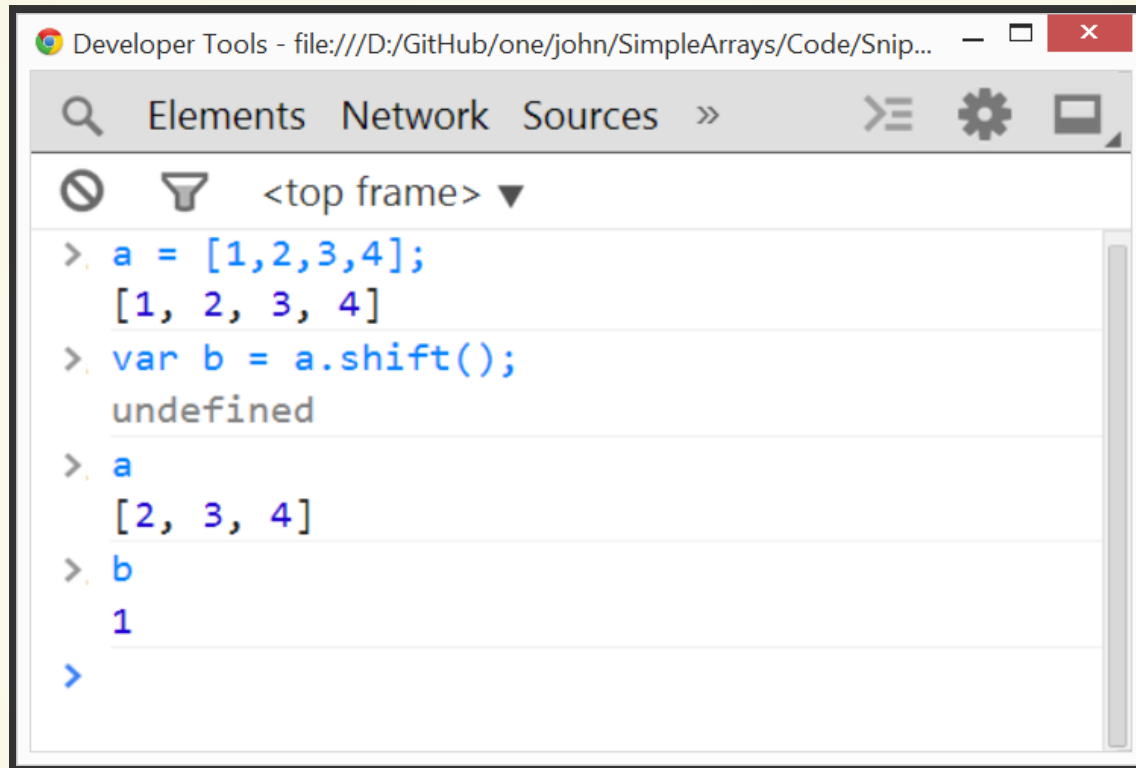
'pop' a number from the end of an array. Alters array length.



The screenshot shows the Chrome Developer Tools console. At the top, the breadcrumb navigation shows '<top frame>'. Below it, the console log displays the following sequence of operations and results:

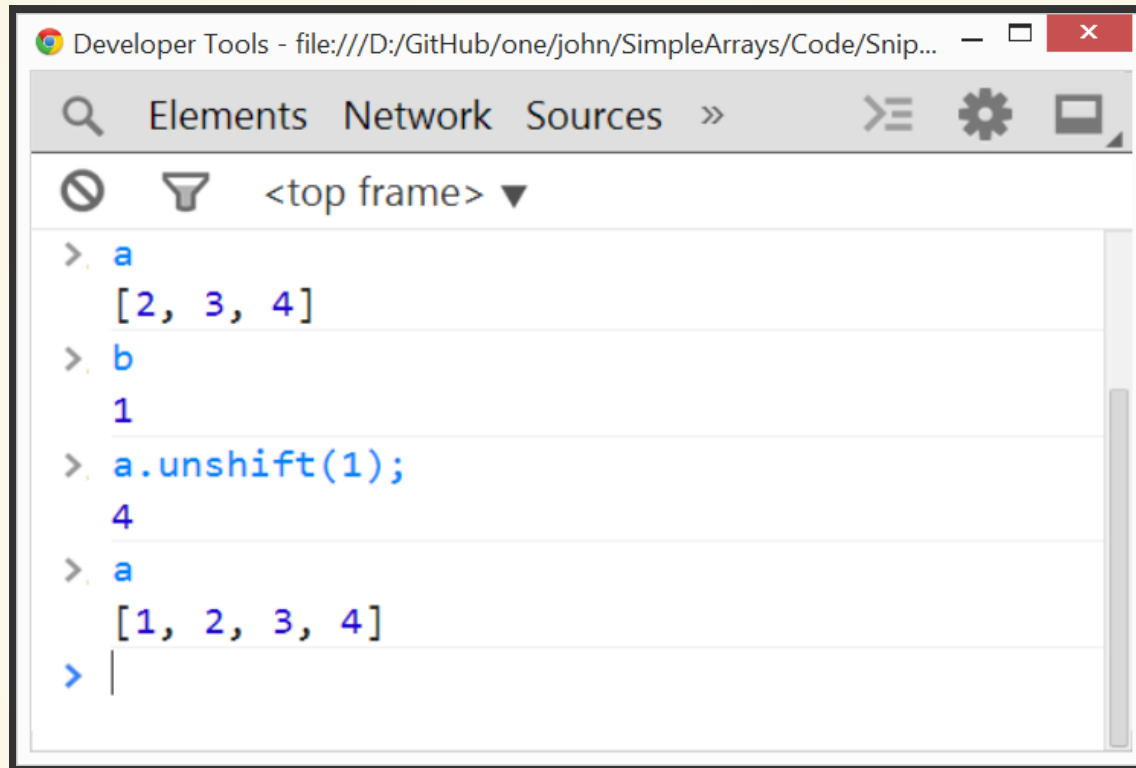
- The array `[1, 2, 3, 4, 5]` is displayed.
- The command `> a.pop();` is entered, and the result `5` is shown.
- The command `> a` is entered, and the result `[1, 2, 3, 4]` is shown.
- A new prompt `> |` is shown at the bottom, indicating the console is ready for further input.

'shift' a number from the beginning of an array. Alters array length.

A screenshot of the Chrome Developer Tools console. The title bar shows 'Developer Tools - file:///D:/GitHub/one/john/SimpleArrays/Code/Snip...'. The console has tabs for 'Elements', 'Network', and 'Sources'. Below the tabs is a filter icon, a funnel icon, and a dropdown menu showing '<top frame>'. The console contains the following code and output:

```
> a = [1,2,3,4];  
[1, 2, 3, 4]  
> var b = a.shift();  
undefined  
> a  
[2, 3, 4]  
> b  
1  
>
```

'unshift' adds a number from the beginning of an array. Alters array length.



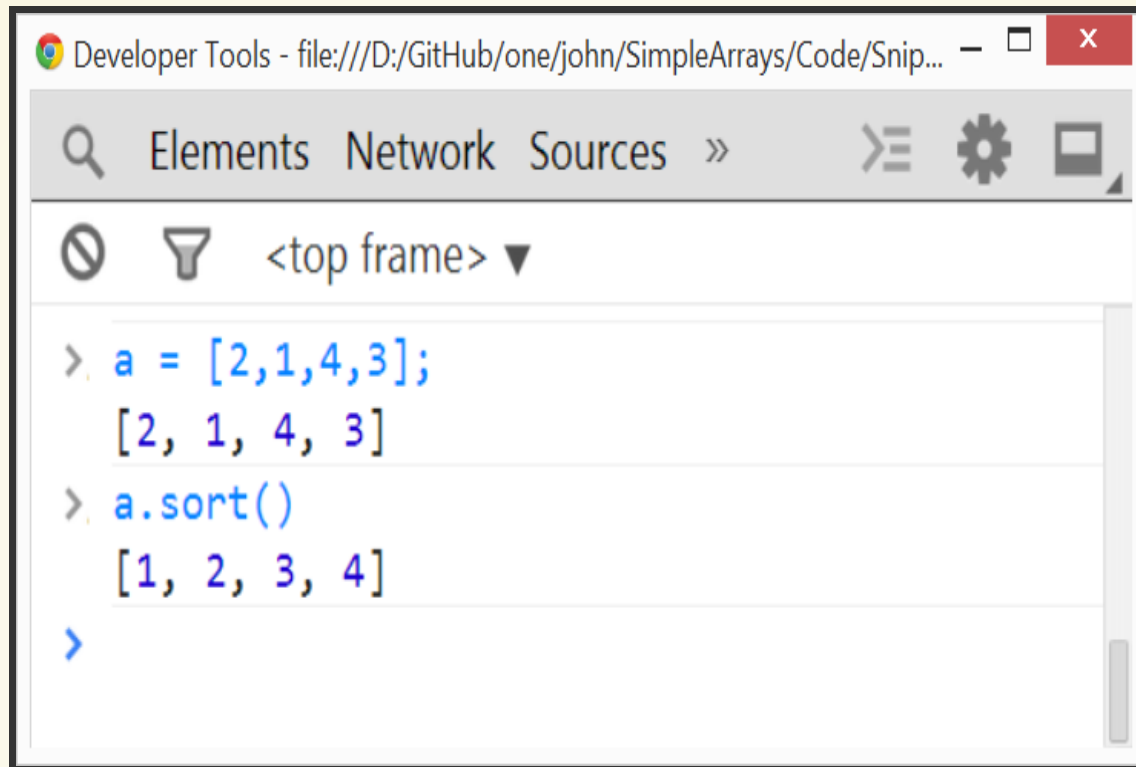
The screenshot shows the Chrome Developer Tools console with the following interactions:

```
> a
[2, 3, 4]
> b
1
> a.unshift(1);
4
> a
[1, 2, 3, 4]
> |
```

The console output demonstrates that the `unshift` method adds the value `1` to the beginning of array `a`, changing its length from 3 to 4 and updating its contents to `[1, 2, 3, 4]`.



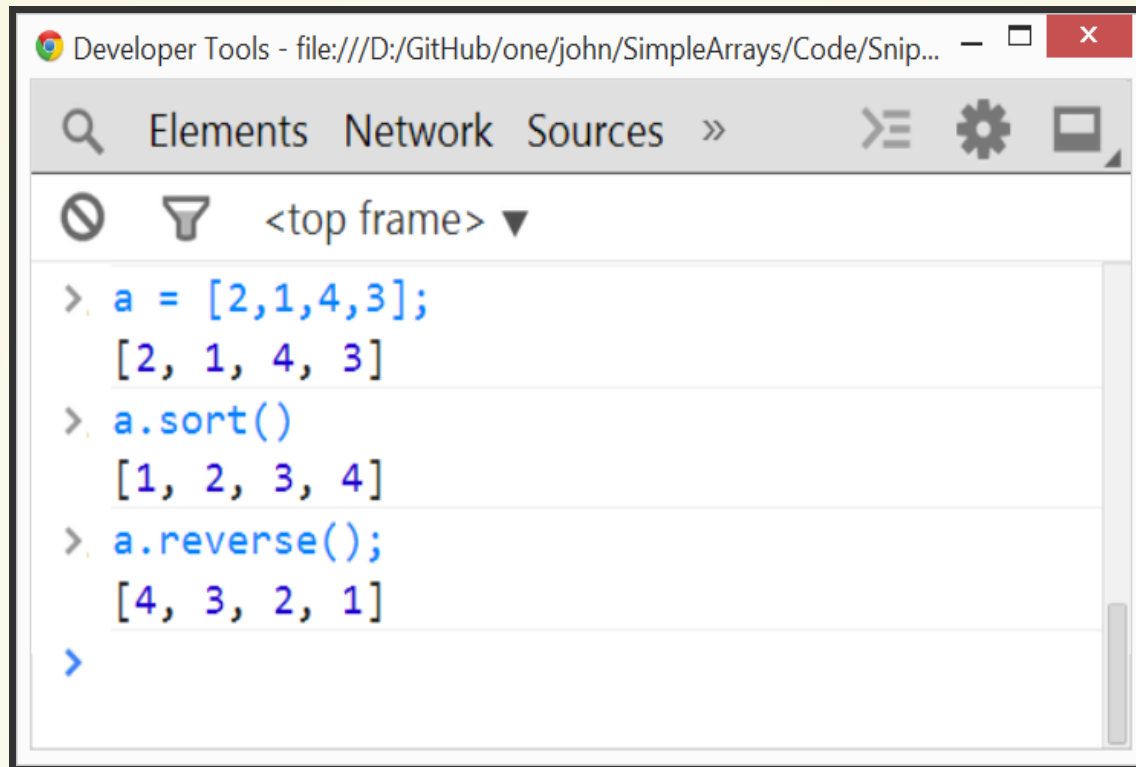
'sort' - sorts an array.



The screenshot shows the Chrome Developer Tools console. The title bar reads "Developer Tools - file:///D:/GitHub/one/john/SimpleArrays/Code/Snip...". The top navigation bar includes "Elements", "Network", and "Sources". Below this, the console shows the execution of two JavaScript commands. The first command, `a = [2,1,4,3];`, is followed by the output `[2, 1, 4, 3]`. The second command, `a.sort();`, is followed by the output `[1, 2, 3, 4]`. The console interface includes a filter icon, a funnel icon, and a dropdown menu showing "<top frame>".

```
> a = [2,1,4,3];  
[2, 1, 4, 3]  
> a.sort()  
[1, 2, 3, 4]  
>
```

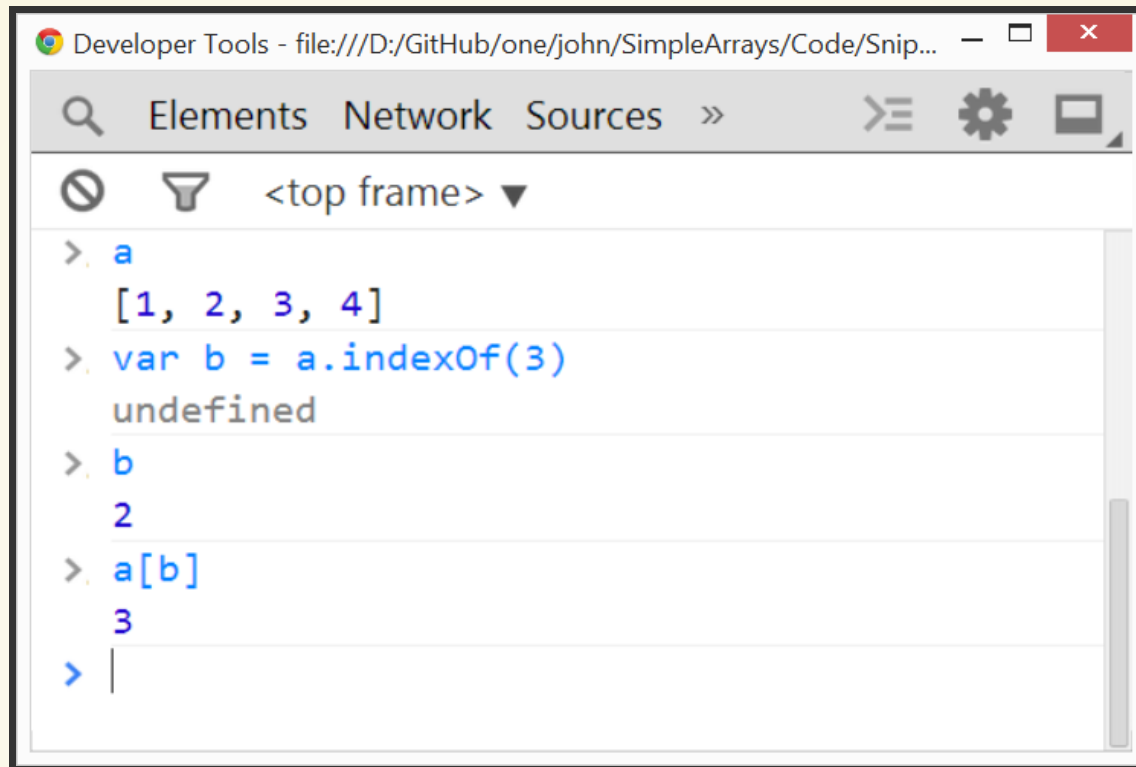
'reverse' - reverse sorts an array.



The screenshot shows the Chrome Developer Tools console. The title bar reads "Developer Tools - file:///D:/GitHub/one/john/SimpleArrays/Code/Snip...". The top navigation bar includes "Elements", "Network", and "Sources". Below this, the console shows the following sequence of commands and results:

```
> a = [2,1,4,3];  
[2, 1, 4, 3]  
> a.sort()  
[1, 2, 3, 4]  
> a.reverse();  
[4, 3, 2, 1]  
>
```

'indexOf' returns the index location of a number.

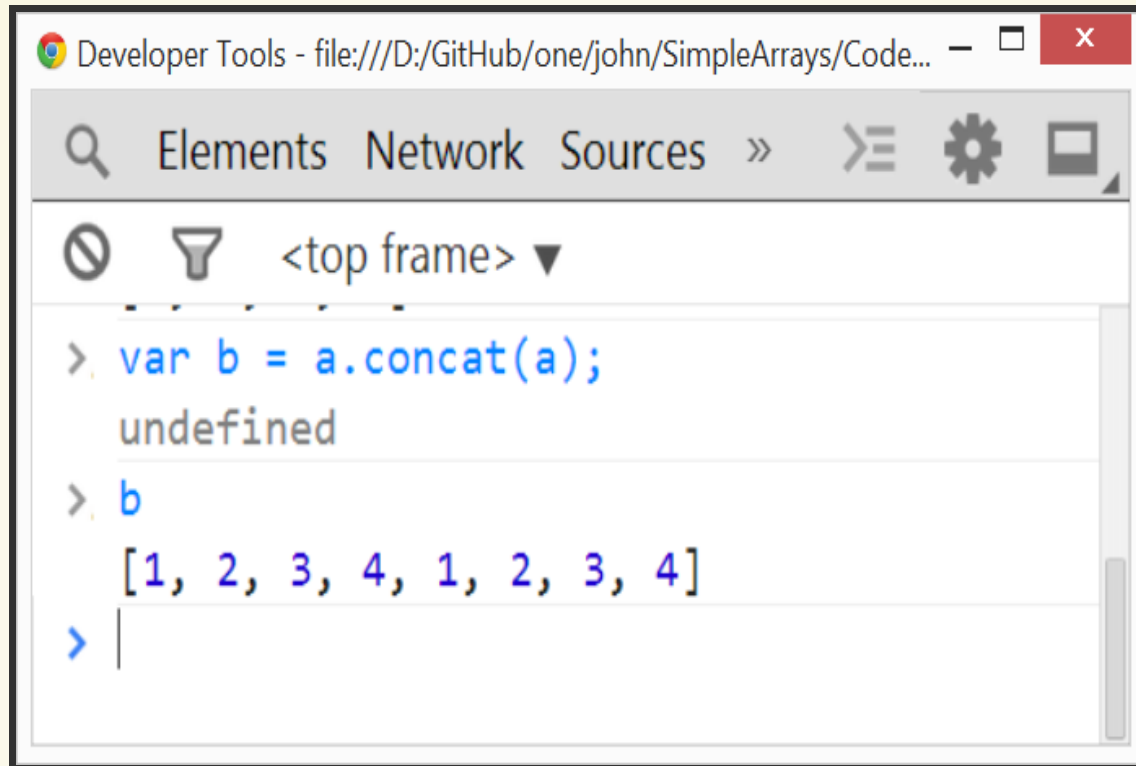


The screenshot shows the Chrome Developer Tools console with the following interactions:

```
> a
[1, 2, 3, 4]
> var b = a.indexOf(3)
undefined
> b
2
> a[b]
3
> |
```

The console output demonstrates that the `indexOf` method returns the index of the first occurrence of the specified value (3) in the array, which is 2. Subsequently, accessing the array at that index (`a[2]`) returns the value 3.

Concatenate 2 arrays into a single array.

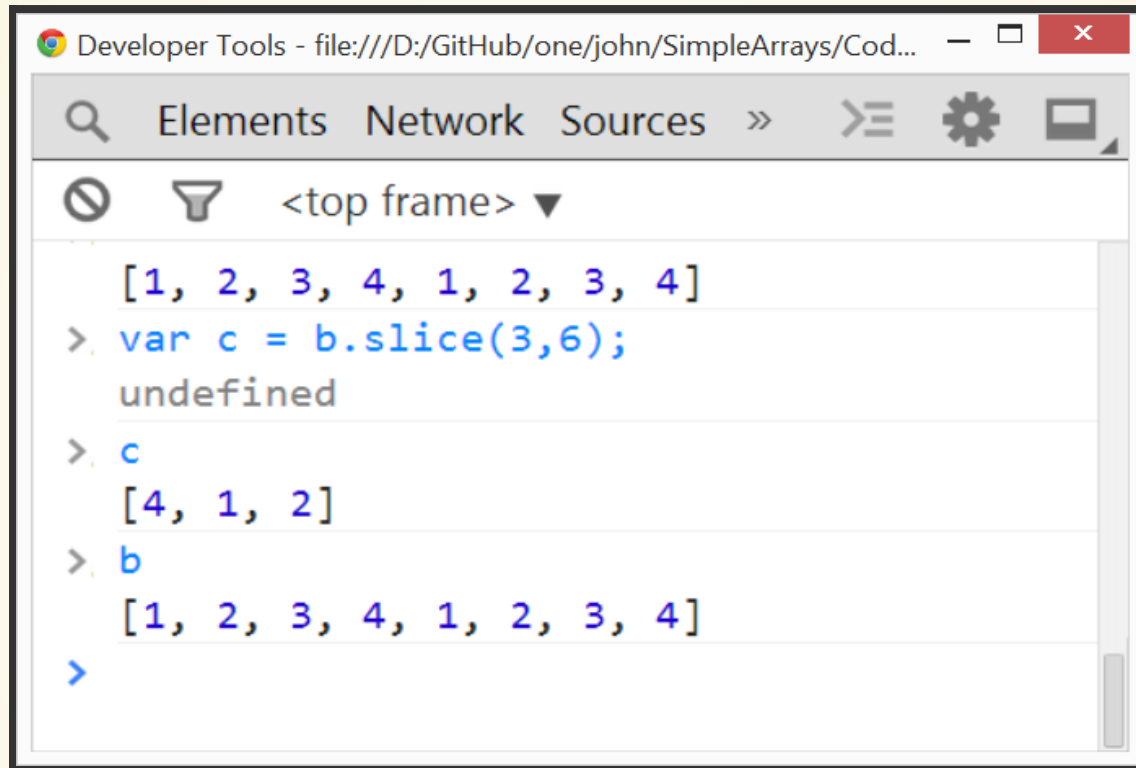


The screenshot shows the Chrome Developer Tools console. The title bar reads "Developer Tools - file:///D:/GitHub/one/john/SimpleArrays/Code...". The top navigation bar includes "Elements", "Network", "Sources", and a search icon. Below this, the console shows the following sequence of commands and results:

```
> var b = a.concat(a);  
undefined  
  
> b  
[1, 2, 3, 4, 1, 2, 3, 4]  
  
> |
```

The first command, `var b = a.concat(a);`, results in `undefined`. The second command, `b`, results in the array `[1, 2, 3, 4, 1, 2, 3, 4]`. The third command is a prompt with a cursor.

'slice' a section out of the array - leaves the array the same.  
`slice(start_pos, upto_end_pos)`

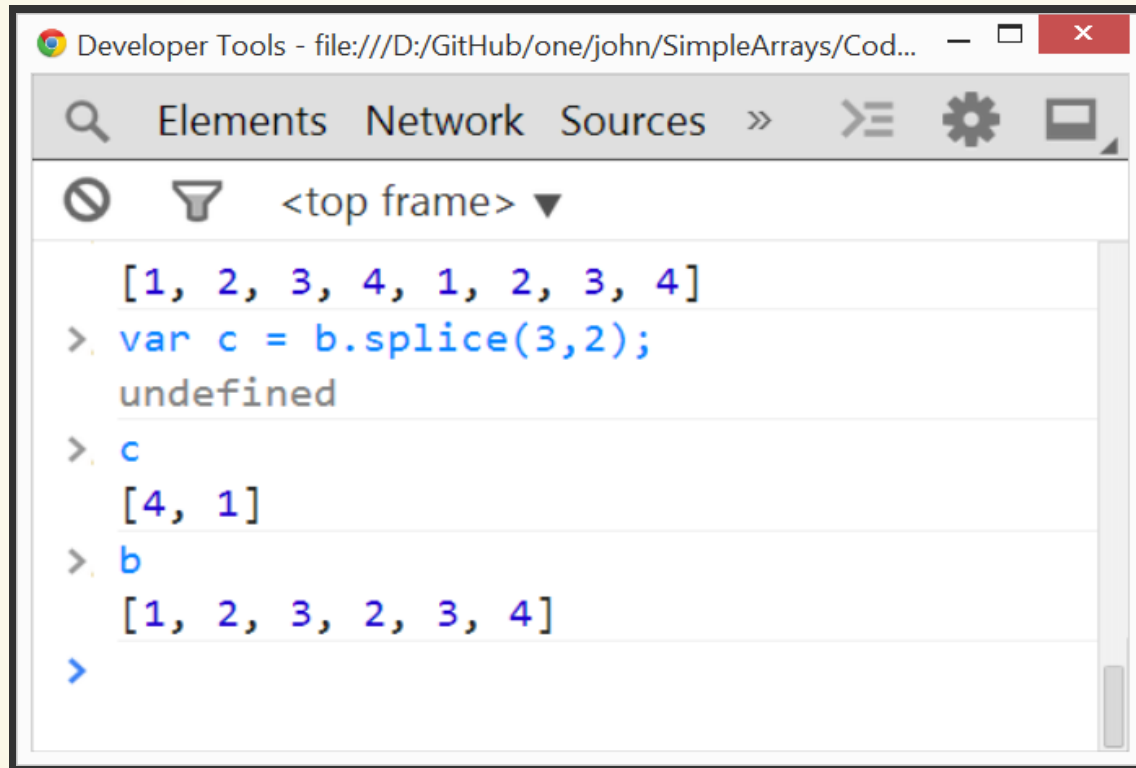
A screenshot of the Chrome Developer Tools console. The title bar shows 'Developer Tools - file:///D:/GitHub/one/john/SimpleArrays/Cod...'. The console has tabs for 'Elements', 'Network', and 'Sources'. The console output shows a sequence of commands and results: first, an array `[1, 2, 3, 4, 1, 2, 3, 4]` is displayed; then, the command `> var c = b.slice(3,6);` is entered, followed by the result `undefined`; next, the command `> c` is entered, followed by the result `[4, 1, 2]`; then, the command `> b` is entered, followed by the result `[1, 2, 3, 4, 1, 2, 3, 4]`; and finally, a prompt `>` is shown at the bottom.

```
Developer Tools - file:///D:/GitHub/one/john/SimpleArrays/Cod...
Elements Network Sources >>
<top frame> ▼
[1, 2, 3, 4, 1, 2, 3, 4]
> var c = b.slice(3,6);
undefined
> c
[4, 1, 2]
> b
[1, 2, 3, 4, 1, 2, 3, 4]
>
```

'splice' a section out of the array - mutilates the array.

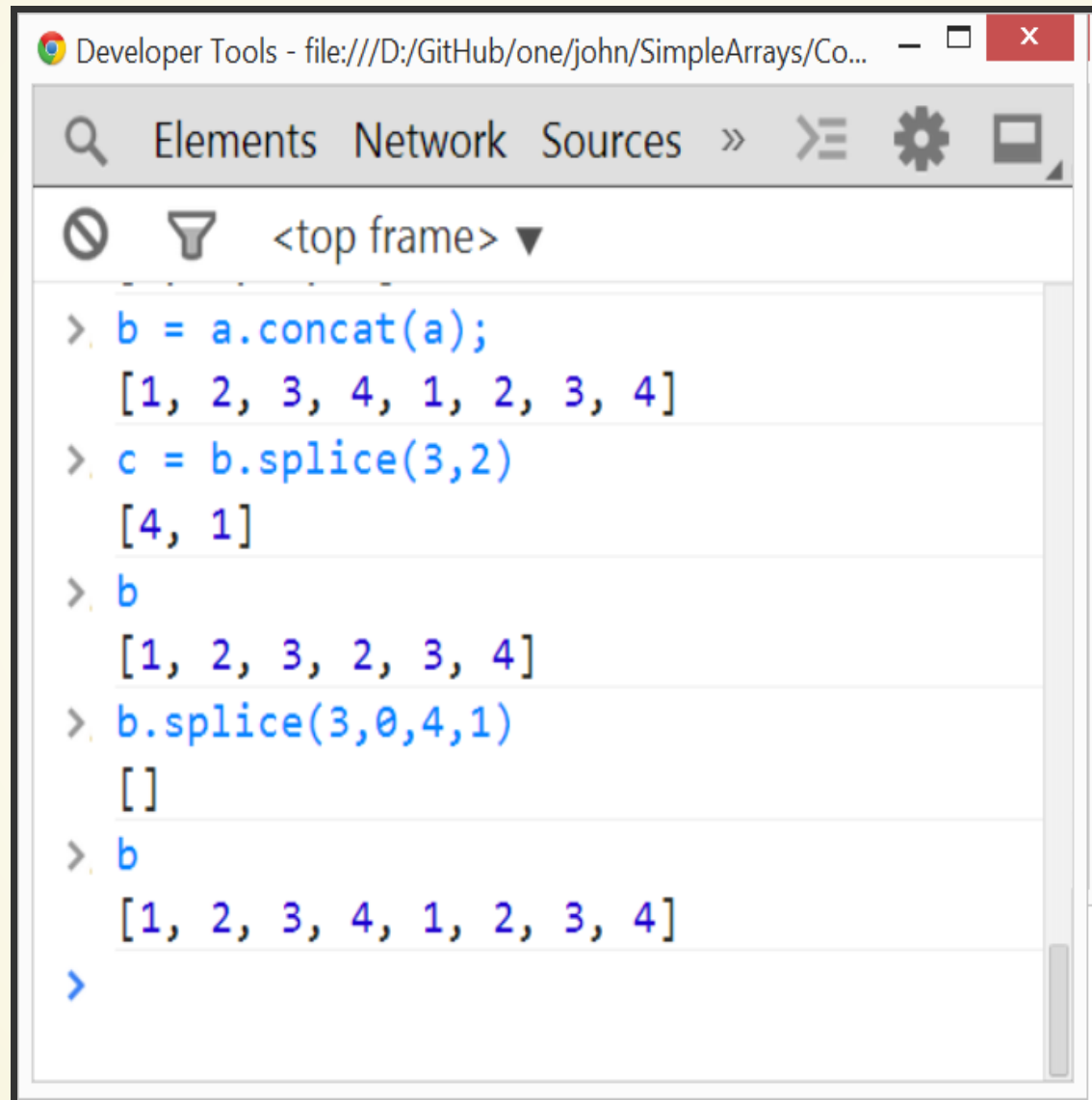
splice(start\_pos, number\_to\_cut\_out)

It is often used to remove the first element. The array can then act like a 'queue' ie splice(0,1)

A screenshot of the Chrome Developer Tools console. The title bar shows 'Developer Tools - file:///D:/GitHub/one/john/SimpleArrays/Cod...'. The console has tabs for 'Elements', 'Network', and 'Sources'. The console output shows an initial array [1, 2, 3, 4, 1, 2, 3, 4]. Then, the command 'var c = b.splice(3,2);' is entered, resulting in 'undefined'. Next, the command '> c' is entered, resulting in '[4, 1]'. Finally, the command '> b' is entered, resulting in '[1, 2, 3, 2, 3, 4]'. The console shows the state of the array after removing two elements starting from index 3.

```
Developer Tools - file:///D:/GitHub/one/john/SimpleArrays/Cod...  
Elements Network Sources >> >≡ ⚙ 🖨  
<top frame> ▼  
[1, 2, 3, 4, 1, 2, 3, 4]  
> var c = b.splice(3,2);  
undefined  
> c  
[4, 1]  
> b  
[1, 2, 3, 2, 3, 4]  
>
```

'splice' can also 'repair' an array by inserting elements.  
`splice(start_pos, 0, elements_to_be_inserted);`



The screenshot shows a web browser window with the title "Developer Tools - file:///D:/GitHub/one/john/SimpleArrays/Co...". The "Elements" tab is selected in the top navigation bar. Below the navigation bar, there is a filter icon, a funnel icon, and a dropdown menu showing "<top frame>". The main area of the developer tools displays a series of commands and their results in a console-like interface. The commands and results are as follows:

```
> b = a.concat(a);  
[1, 2, 3, 4, 1, 2, 3, 4]  
  
> c = b.splice(3,2)  
[4, 1]  
  
> b  
[1, 2, 3, 2, 3, 4]  
  
> b.splice(3,0,4,1)  
[]  
  
> b  
[1, 2, 3, 4, 1, 2, 3, 4]  
  
>
```

A green chalkboard with a wooden frame, centered on a light yellow background. The text "your turn now" is written in white cursive on the board.

your turn now



# FINAL EXERCISES - HAND THESE IN FOR ACTIVE LEARNING

Input the array `a = [4,3,2,1];`

What is left in the array if I do the following;

`a.pop(); a.slice(1,2);a.splice(0,1);a.splice(1,0,1,1,1);`

Add one more splice command that will leave `a = [2];`

# COIN TOSS EXPERIMENT

We want to simulate tossing a coin. How many coin tosses does it take before you get 6 heads in a row? Take an average of 10 trials by hand. Now change the code to automatically take the average of 100 trials and print it out.



**THE END**