

## Lesson 4 Demo 3

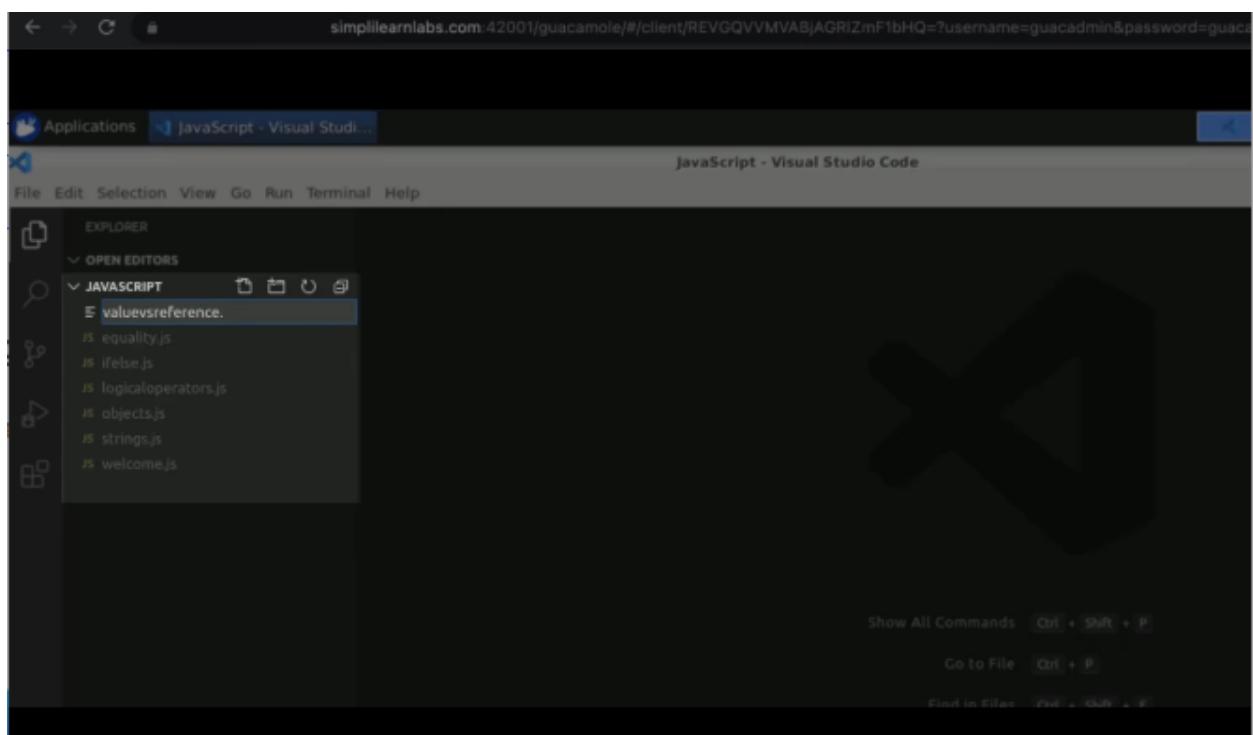
### Value Vs. Reference

**Objective:** To understand the difference between value and reference

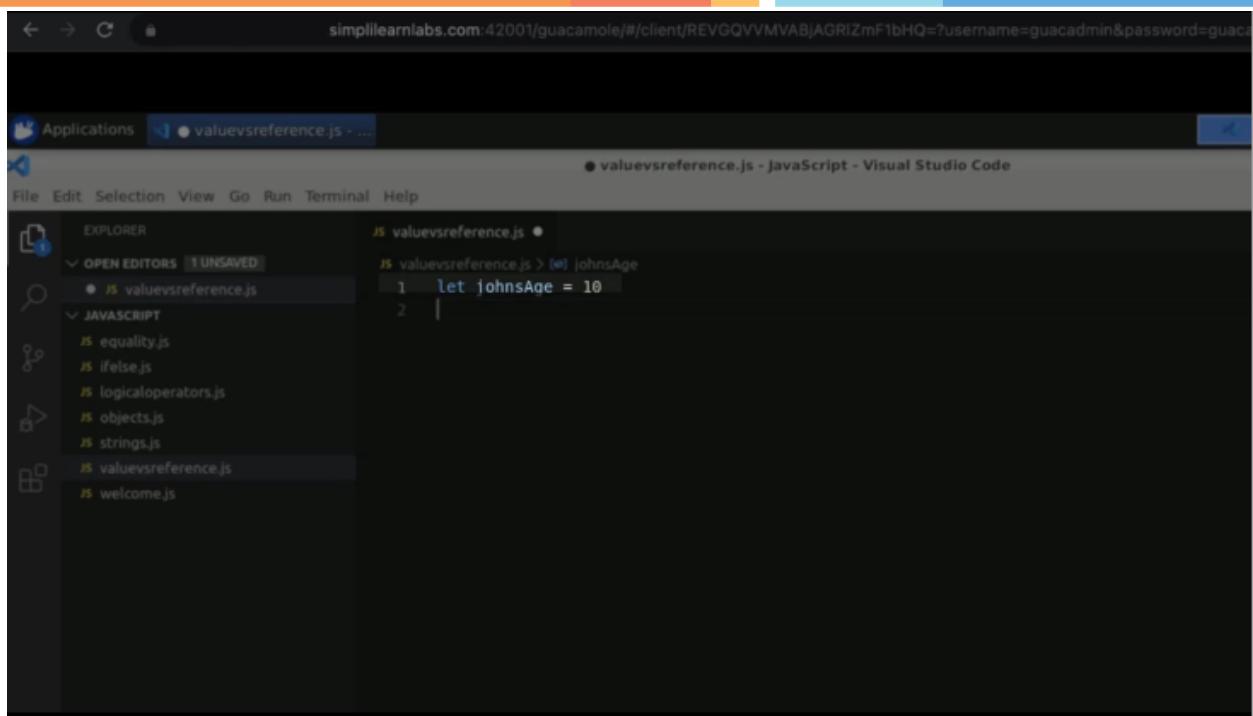
**Prerequisites:** None

#### Steps to perform:

1. Create a file named 'valuevsreference.js'.



2. Create a variable.

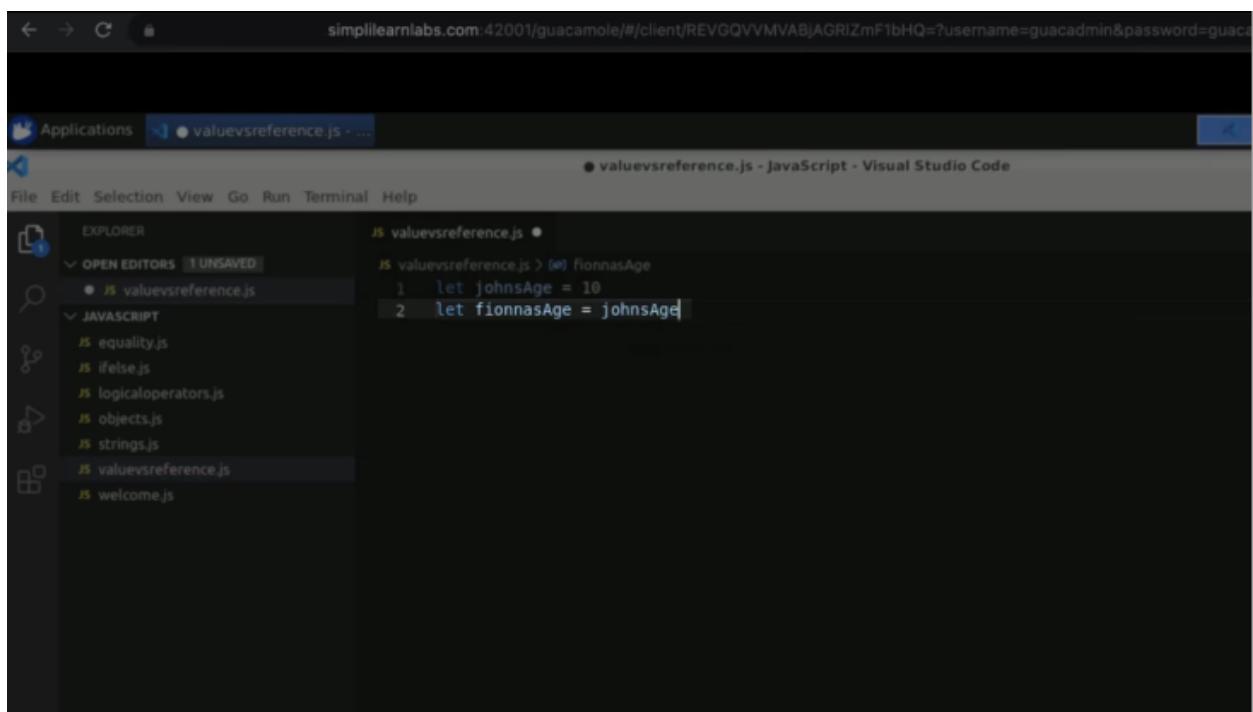


The screenshot shows a Visual Studio Code interface running in a browser window. The title bar reads "simplilearnlabs.com:42001/guacamole/#/client/REVGQVVMVABjAGRIZmF1bHQ=?username=guacadmin&password=guac". The code editor has a dark theme and displays the file "valuevsreference.js" with the following content:

```
JS valuevsreference.js •
JS valuevsreference.js > (0) johnsAge
1 let johnsAge = 10
2 |
```

The left sidebar shows an "EXPLORER" view with several JavaScript files listed under "JAVASCRIPT": equality.js, ifelse.js, logicaloperators.js, objects.js, strings.js, valuevsreference.js (which is selected), and welcome.js.

### 3. Create a variable.



The screenshot shows a Visual Studio Code interface running in a browser window. The title bar reads "simplilearnlabs.com:42001/guacamole/#/client/REVGQVVMVABjAGRIZmF1bHQ=?username=guacadmin&password=guac". The code editor has a dark theme and displays the file "valuevsreference.js" with the following content:

```
JS valuevsreference.js •
JS valuevsreference.js > (0) fionnasAge
1 let johnsAge = 10
2 let fionnasAge = johnsAge|
```

The left sidebar shows an "EXPLORER" view with several JavaScript files listed under "JAVASCRIPT": equality.js, ifelse.js, logicaloperators.js, objects.js, strings.js, valuevsreference.js (which is selected), and welcome.js.

### 4. Pass log statements.

simplilearnlabs.com:42001/guacamole/#/client/REVGQVVMVABjAGRIZmF1bHQ=?username=guacadmin&password=guaca

Applications valuevsreference.js - Ja...

File Edit Selection View Go Run Terminal Help

EXPLORER JS valuevsreference.js ×

OPEN EDITORS JS valuevsreference.js > ...

JAVASCRIPT JS equality.js  
JS ifelse.js  
JS logicaloperators.js  
JS objects.js  
JS strings.js  
JS valuevsreference.js  
JS welcome.js

```

1 let johnsAge = 10
2 let fionnasAge = johnsAge
3
4 console.log("johnsAge: "+johnsAge);
5 console.log(["fionnasAge: "+fionnasAge]);
6
7

```

## 5. Run the code in the terminal.

valuevsreference.js - JavaScript - Visual Studio Code

File Edit Selection View Go Run Terminal Help

EXPLORER JS valuevsreference.js ×

OPEN EDITORS JS valuevsreference.js > ...

JAVASCRIPT JS equality.js  
JS ifelse.js  
JS logicaloperators.js  
JS objects.js  
JS strings.js  
JS valuevsreference.js  
JS welcome.js

```

1 let johnsAge = 10
2 let fionnasAge = johnsAge
3
4 console.log("johnsAge: "+johnsAge);
5 console.log(["fionnasAge: "+fionnasAge]);
6
7

```

TERMINAL PROBLEMS OUTPUT DEBUG CONSOLE 1:bash

```

erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ █

```

## 6. Add 'johnAge =12'.

```

 1 let johnsAge = 10
 2 let fionnasAge = johnsAge
 3
 4 console.log("johnsAge: "+johnsAge);
 5 console.log("fionnasAge: "+fionnasAge);
 6
 7 johnsAge = 12;
 8
 9

```

The terminal output shows:

```

erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ 

```

## 7. Pass the log statements again.

```

 1 let johnsAge = 10
 2 let fionnasAge = johnsAge
 3
 4 console.log("johnsAge: "+johnsAge);
 5 console.log("fionnasAge: "+fionnasAge);
 6
 7 johnsAge = 12;
 8
 9 console.log("johnsAge now is: "+johnsAge);
10 console.log("fionnasAge now is: "+fionnasAge);
11

```

The terminal output shows:

```

erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
johnsAge now is: 12
fionnasAge now is: 10
erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ 

```

## 8. Execute the code.

valuevsreference.js - JavaScript - Visual Studio Code

```

let johnsAge = 10
let fionnasAge = johnsAge
console.log("johnsAge: "+johnsAge);
console.log("fionnasAge: "+fionnasAge);
johnsAge = 12;
Console.log("johnsAge now is: "+johnsAge);
console.log(["fionnasAge now is: "+fionnasAge]);

```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```

erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
johnsAge now is: 12
fionnasAge now is: 10
erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ 

```

## 9. Create an array of ages.

valuevsreference.js - JavaScript - Visual Studio Code

```

let johnsAge = 10
let fionnasAge = johnsAge // Copy Operation -> By Value
console.log("johnsAge: "+johnsAge);
console.log("fionnasAge: "+fionnasAge);
johnsAge = 12;
console.log("johnsAge now is: "+johnsAge);
console.log("fionnasAge now is: "+fionnasAge);
let ages = [10, 20, 30, 40, 50]

```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```

erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
johnsAge now is: 12
fionnasAge now is: 10
erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ 

```

## 10. Create one more variable called groupAges.

The screenshot shows a Visual Studio Code interface with the following details:

- File Explorer:** Shows files like `valuevsreference.js`, `quality.js`, `else.js`, `picaloperators.js`, `jects.js`, `rings.js`, `uevsreference.js`, and `welcome.js`.
- Editor:** The `valuevsreference.js` file is open, containing the following code:
 

```

1 let johnsAge = 10
2 let fionnasAge = johnsAge // Copy Operation -> By Value
3
4 console.log("johnsAge: "+johnsAge);
5 console.log("fionnasAge: "+fionnasAge);
6
7 johnsAge = 12;
8
9 console.log("johnsAge now is: "+johnsAge);
10 console.log("fionnasAge now is: "+fionnasAge);
11
12 let ages = [10, 20, 30, 40, 50]
13 let groupAges = ages; // Copy Operation |
14
      
```
- Terminal:** The terminal shows the output of running the script with node:
 

```

erishant@gmail:ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
erishant@gmail:ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
johnsAge now is: 12
fionnasAge now is: 10
erishant@gmail:ip-172-31-90-232:~/Desktop/JavaScript$ 
      
```

11. Write group age of the first index is 22, and the group age of the third index is 45.

The screenshot shows a Visual Studio Code interface with the following details:

- File Explorer:** Shows files like `valuevsreference.js`, `quality.js`, `else.js`, `picaloperators.js`, `jects.js`, `rings.js`, `uevsreference.js`, and `welcome.js`.
- Editor:** The `valuevsreference.js` file is open, containing the following code:
 

```

2 let fionnasAge = johnsAge // Copy Operation -> By Value
3
4 console.log("johnsAge: "+johnsAge);
5 console.log("fionnasAge: "+fionnasAge);
6
7 johnsAge = 12;
8
9 console.log("johnsAge now is: "+johnsAge);
10 console.log("fionnasAge now is: "+fionnasAge);
11
12 let ages = [10, 20, 30, 40, 50]
13 let groupAges = ages; // Copy Operation -> By Reference
14
15 groupAges[1] = 22
16 groupAges[3] = 45
17
      
```
- Terminal:** The terminal shows the output of running the script with node:
 

```

erishant@gmail:ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
erishant@gmail:ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
johnsAge now is: 12
fionnasAge now is: 10
erishant@gmail:ip-172-31-90-232:~/Desktop/JavaScript$ 
      
```

12. Pass a log statement.

The screenshot shows the Visual Studio Code interface. The left sidebar lists files: valuevsreference.js (the current editor), quality.js, lse.js, picaloperators.js, objects.js, strings.js, valuevsreference.js (another entry), and welcome.js. The right pane displays the code for valuevsreference.js:`1 // valuevsreference.js ...
2 johnsAge = 44,
3
4 console.log("johnsAge now is: "+johnsAge);
5 console.log("fionnasAge now is: "+fionnasAge);
6
7 let ages = [10, 20, 30, 40, 50]
8 let groupAges = ages; // Copy Operation -> By Reference
9
10 groupAges[1] = 22
11 groupAges[3] = 45
12
13 console.log("Ages: "+ages);`The terminal at the bottom shows the execution of the script twice. The first run shows the initial state with ages 10, 20, 30, 40, 50. The second run shows the state after modification, where the second and fourth elements have been changed to 22 and 45 respectively.`erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
johnsAge now is: 12
fionnasAge now is: 10
erishant@gmail@ip-172-31-90-232:~/Desktop/JavaScript$`

### 13. Re-run the code.

This screenshot is identical to the one above, showing the Visual Studio Code interface with the same code in the editor and the same terminal output. The terminal output is highlighted with a red box around the second run of the script, specifically the lines showing the modification of the array elements.