

## Lesson 4 Demo 3

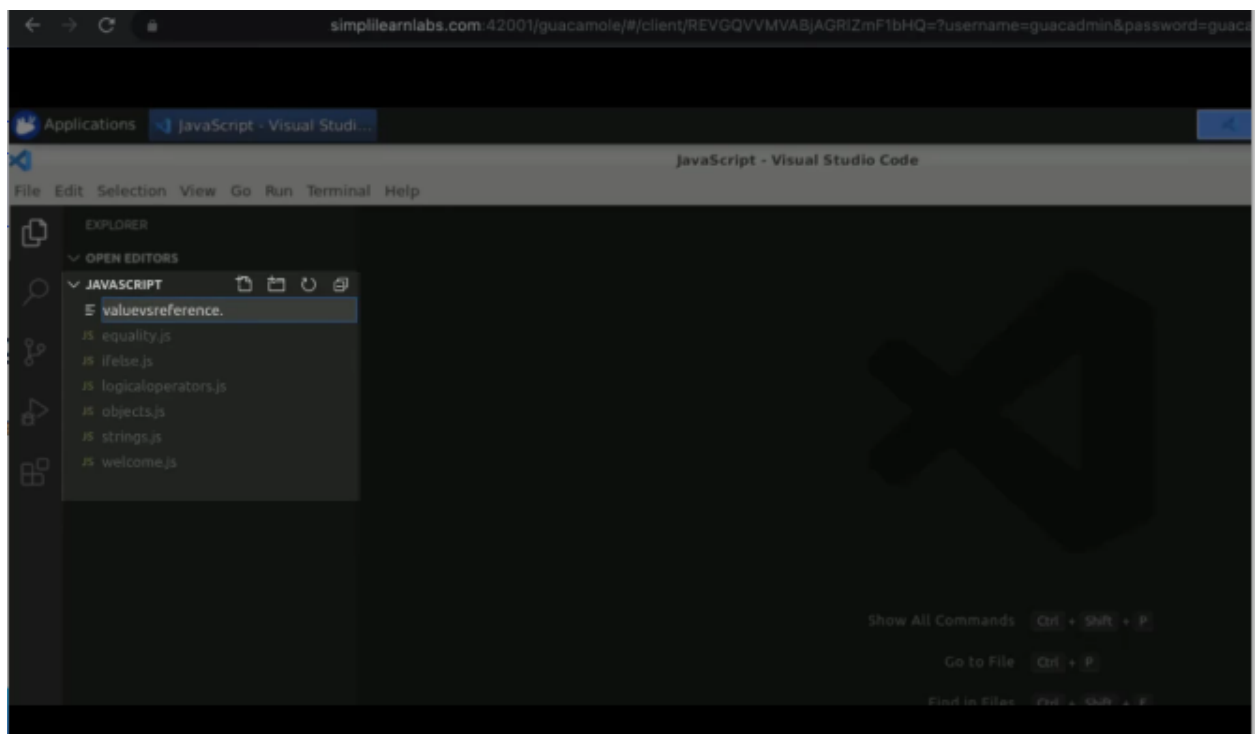
### Value Vs. Reference

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

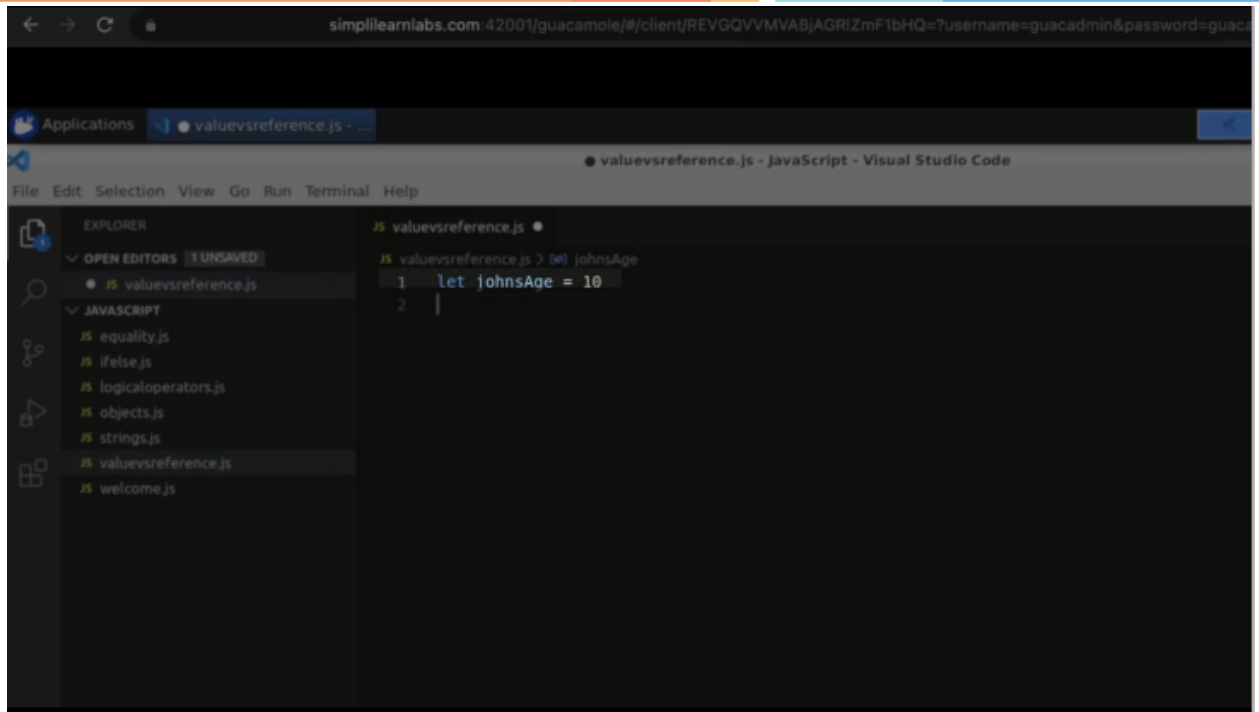
**Prerequisites:** None

#### Steps to perform:

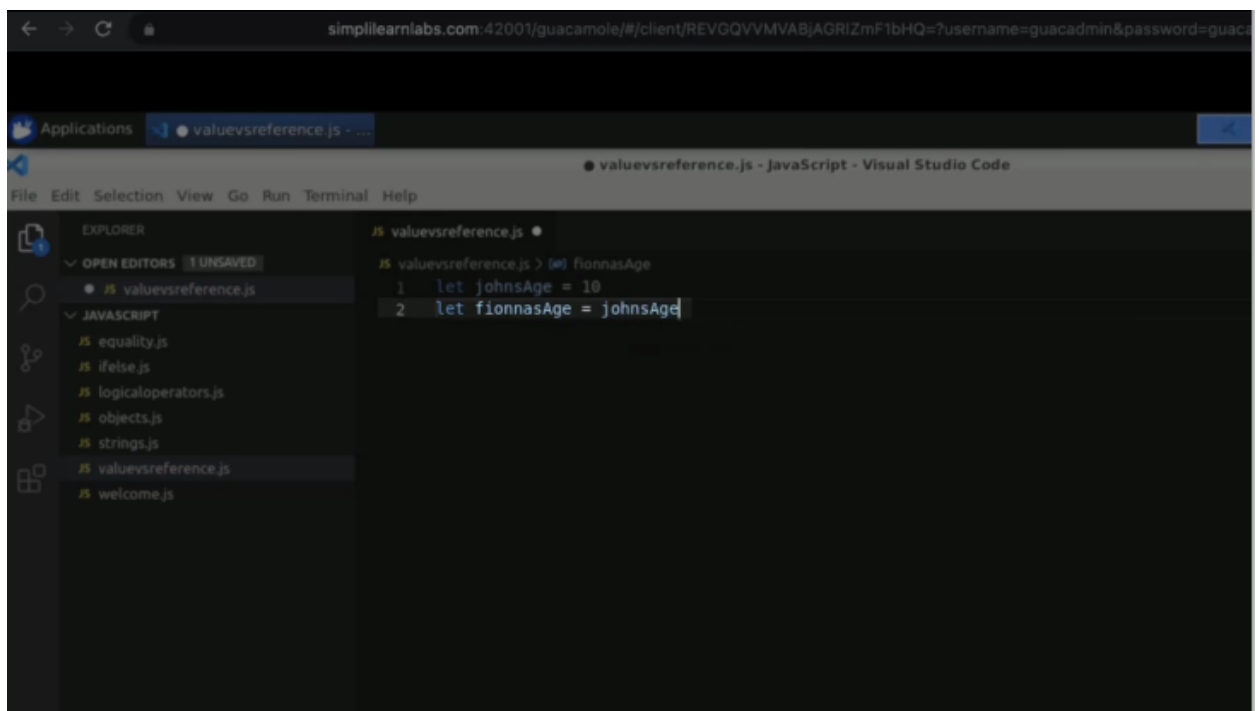
1. Create a file named 'valuevsreference.js'.



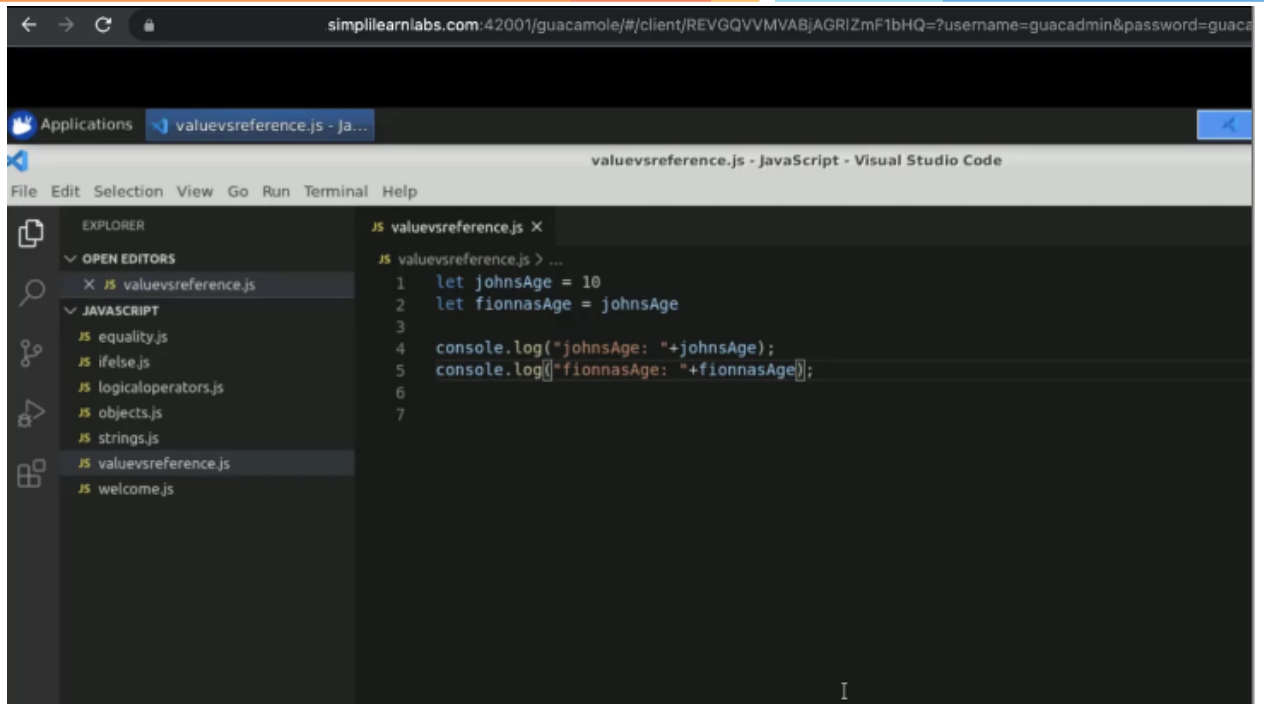
2. Create a variable.



3. Create a variable.



4. Pass log statements.

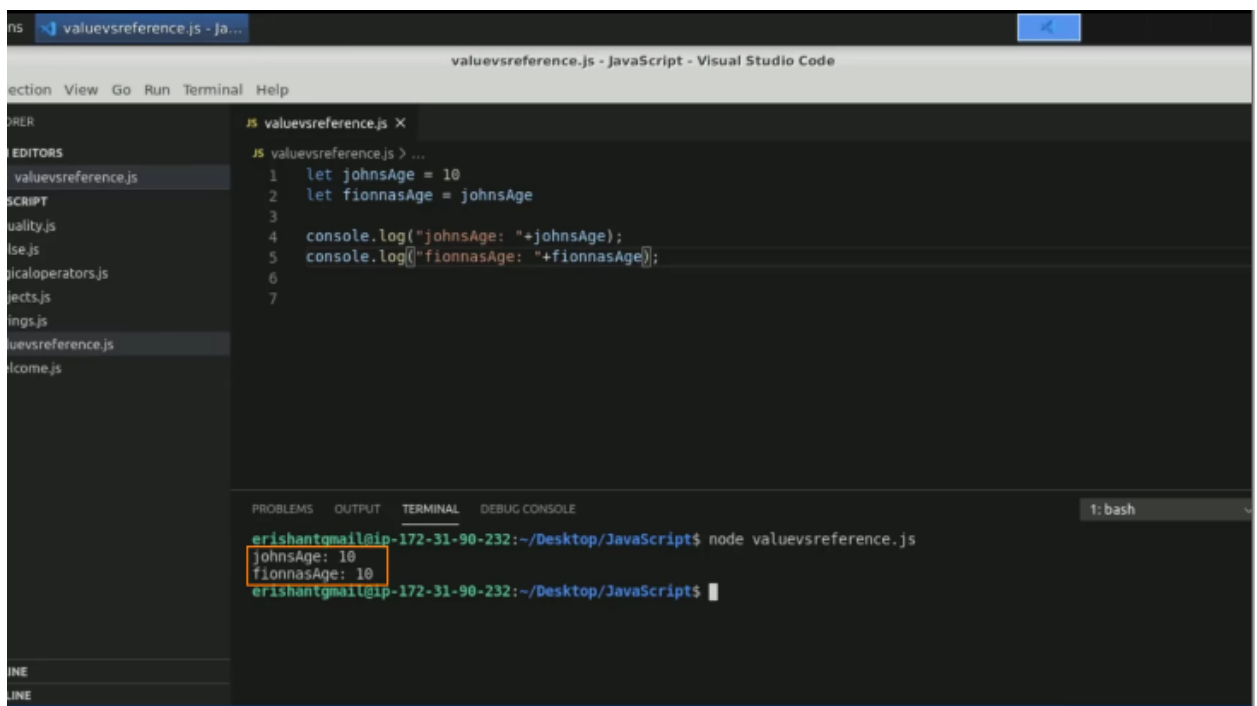


```

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.

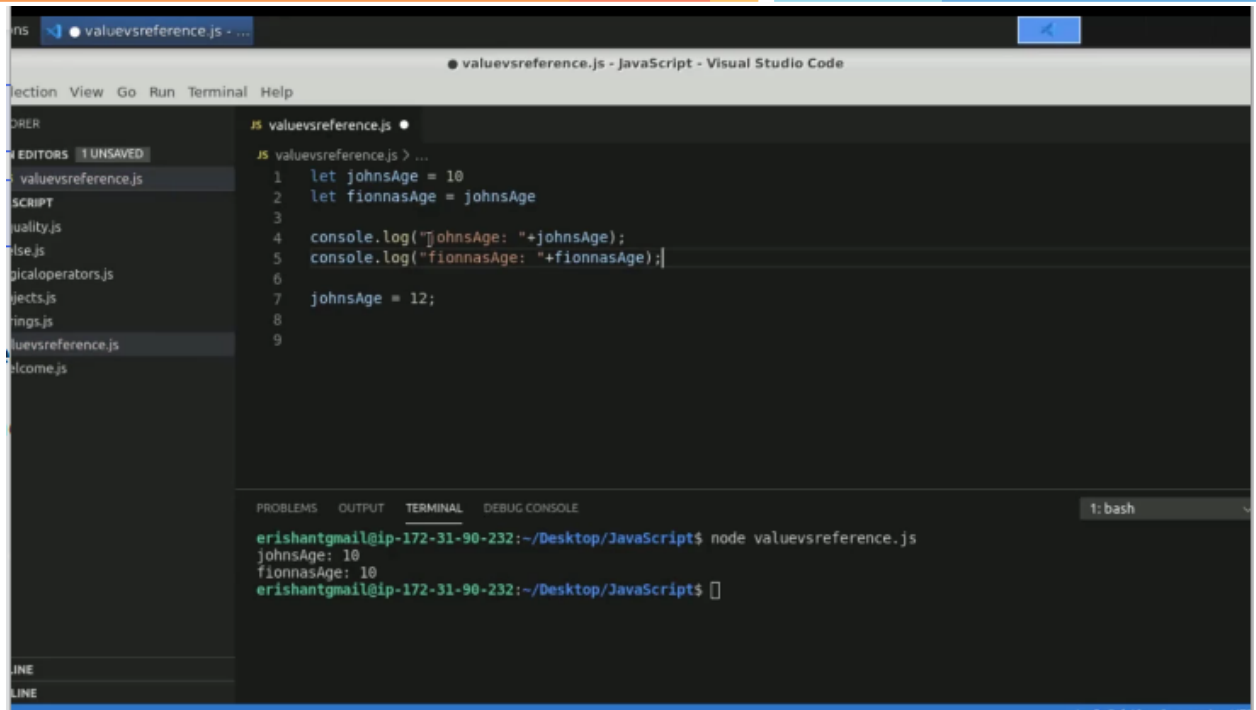


```

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

```

6. Add 'johnAge =12'.



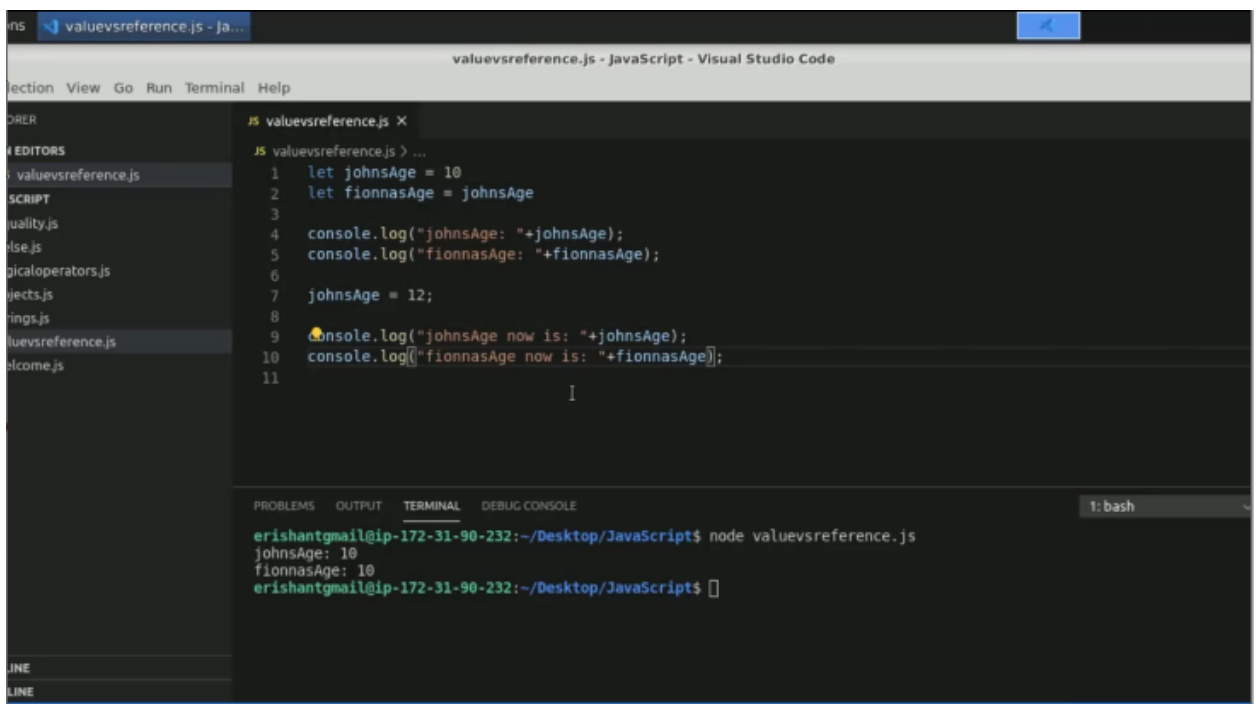
```

valuevsreference.js
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

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

```

7. Pass the log statements again.



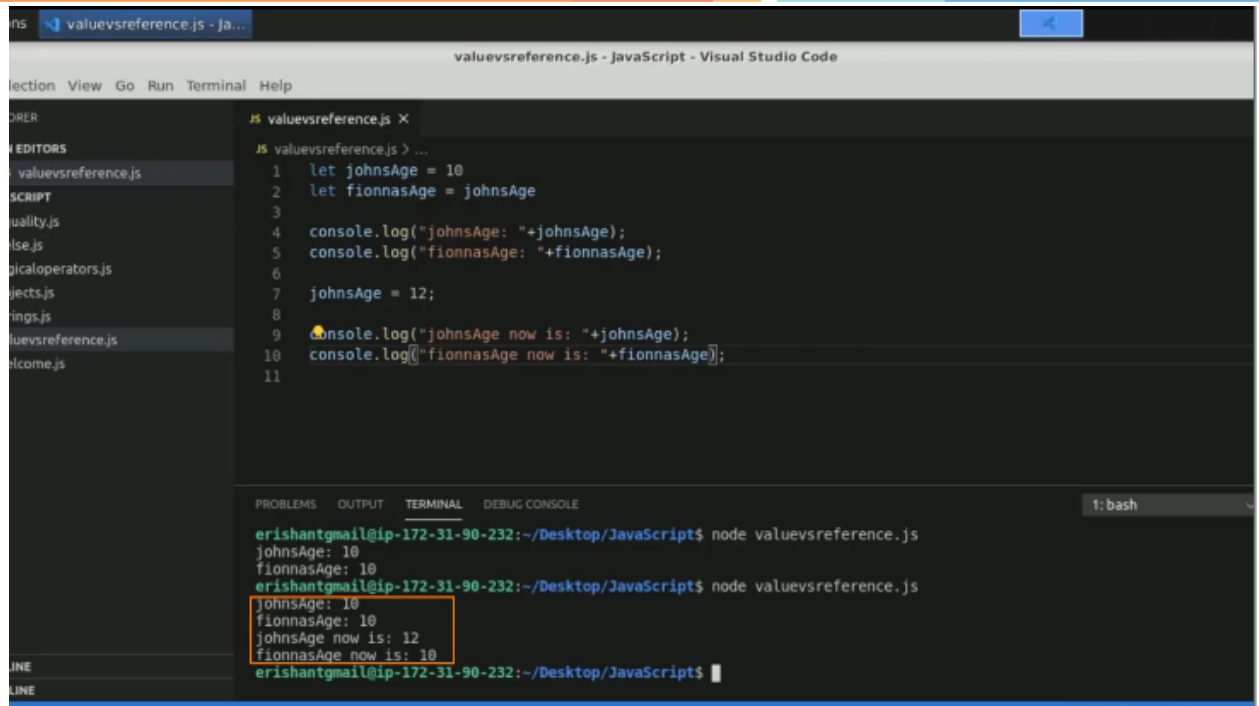
```

valuevsreference.js
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

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

```

8. Execute the code.



The screenshot shows the Visual Studio Code editor with a file named `valuevsreference.js` open. The code in the editor is as follows:

```

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

```

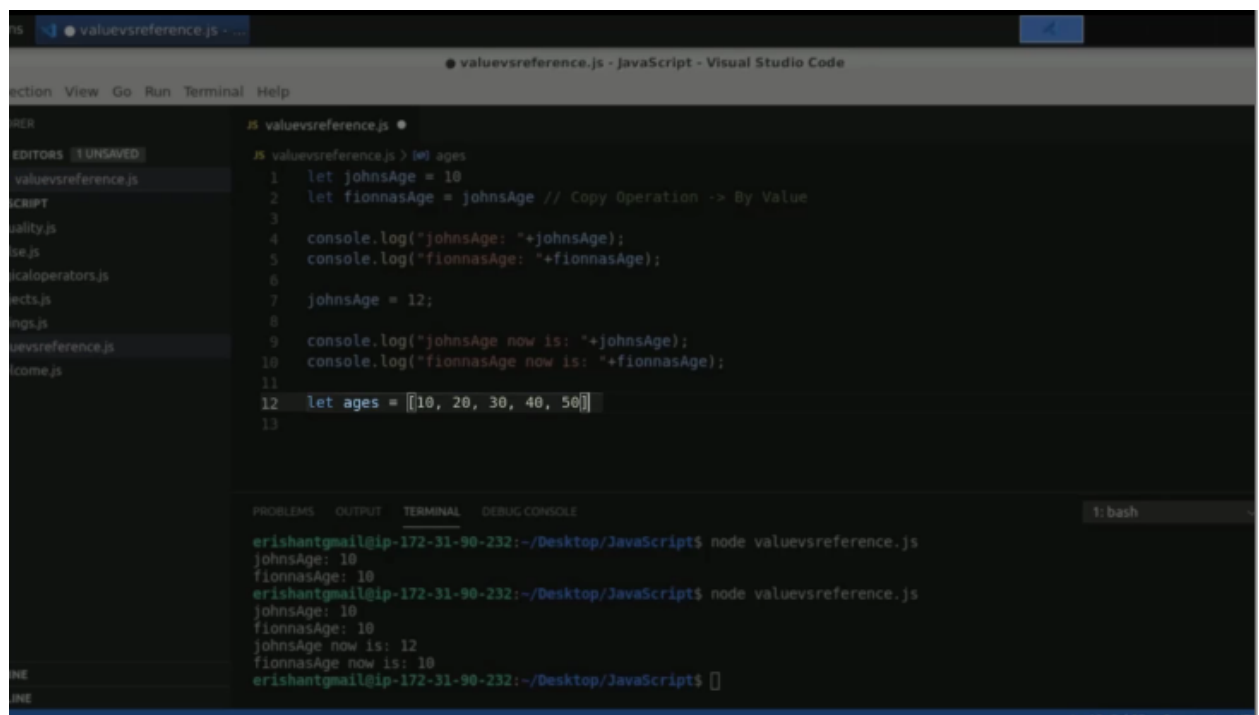
The terminal output shows the execution of the script twice. The first run shows the initial state where both `johnsAge` and `fionnasAge` are 10. The second run shows that `johnsAge` has been updated to 12, but `fionnasAge` remains 10, demonstrating that the original value was copied.

```

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

```

9. Create an array of ages.



The screenshot shows the Visual Studio Code editor with the same file `valuevsreference.js`. A new line of code has been added at the bottom of the file:

```

12 let ages = [10, 20, 30, 40, 50];
13

```

The terminal output shows the execution of the script twice. The first run shows the initial state where both `johnsAge` and `fionnasAge` are 10. The second run shows that `johnsAge` has been updated to 12, but `fionnasAge` remains 10, demonstrating that the original value was copied.

```

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

```

10. Create one more variable called groupAges.

```

valuevsreference.js
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

```

```

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

```

valuevsreference.js
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

```

```

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

```

12. Pass a log statement.

```

valuevsreference.js
1 // johnsAge = 10;
2
3
4
5
6
7
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
18 console.log("Ages: "+ages);
19
20

```

```

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

```

13. Re-run the code.

```

valuevsreference.js
1 // johnsAge = 10;
2
3
4
5
6
7
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
18 console.log("Ages: "+ages);
19
20

```

```

fionnasAge: 10
johnsAge now is: 12
fionnasAge now is: 10
erishantgmail@ip-172-31-90-232:~/Desktop/JavaScript$ node valuevsreference.js
johnsAge: 10
fionnasAge: 10
johnsAge now is: 12
fionnasAge now is: 10
Ages: 10,22,30,45,50
erishantgmail@ip-172-31-90-232:~/Desktop/JavaScript$

```