

## Episode 4 : Functions and Variable Environments

```
var x = 1;
a();
b(); // we are calling the functions before defining them. This will work
properly, as seen in Hoisting.
console.log(x); // 3

function a() {
  var x = 10; // localscope because of separate execution context
  console.log(x); // 1
}

function b() {
  var x = 100;
  console.log(x); // 2
}
```

Outputs:

10

100

1

### Code Flow in terms of Execution Context

- The Global Execution Context (GEC) is created (the big box with Memory and Code subparts). Also GEC is pushed into Call Stack

Call Stack : GEC

- In first phase of GEC (memory phase), variable x:undefined and a and b have their entire function code as value initialized
- In second phase of GEC (execution phase), when the function is called, a new local Execution Context is created. After x = 1 assigned to GEC x, a() is called. So local EC for a is made inside code part of GEC.

Call Stack: [GEC, a()]

- For local EC, a totally different x variable assigned undefined(x inside a()) in phase 1 , and in phase 2 it is assigned 10 and printed in console log. After printing, no more commands to run, so a() local EC is removed from both GEC and from Call stack

Call Stack: GEC

- Cursor goes back to b() function call. Same steps repeat.

Call Stack :[GEC, b()] -> GEC (after printing yet another totally different x value as 100 in console log)

- Finally GEC is deleted and also removed from call stack. Program ends.
- reference:

Memory	Code				
$x: 1$	$\text{val } x = 1$				
$a: \{..\}$	<table border="1"> <thead> <tr> <th>M</th><th>C</th></tr> </thead> <tbody> <tr> <td><math>x:</math> 10</td><td><math>\text{var } x = 10</math> <math>\text{console.log}(x)</math></td></tr> </tbody> </table>	M	C	$x:$ 10	$\text{var } x = 10$ $\text{console.log}(x)$
M	C				
$x:$ 10	$\text{var } x = 10$ $\text{console.log}(x)$				
$b: \{..\}$	<table border="1"> <thead> <tr> <th>M</th><th>C</th></tr> </thead> <tbody> <tr> <td><math>x:</math> 100 GEC</td><td><math>\text{var } x = 100</math> <math>\text{console.log}(x)</math></td></tr> </tbody> </table>	M	C	$x:$ 100 GEC	$\text{var } x = 100$ $\text{console.log}(x)$
M	C				
$x:$ 100 GEC	$\text{var } x = 100$ $\text{console.log}(x)$				

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