

YOU DON'T KNOW

JAVASCRIPT



HMM...
WHO ADDED THIS SLIDE...
VEEEERRR!!

SORRY ...
PLEASE CONTINUE ...

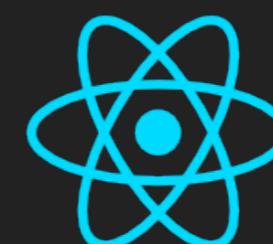
VEER

S



JS

F
5



B

npm



BABEL



DB

np



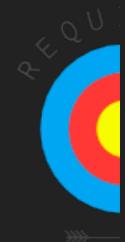
BA



DB

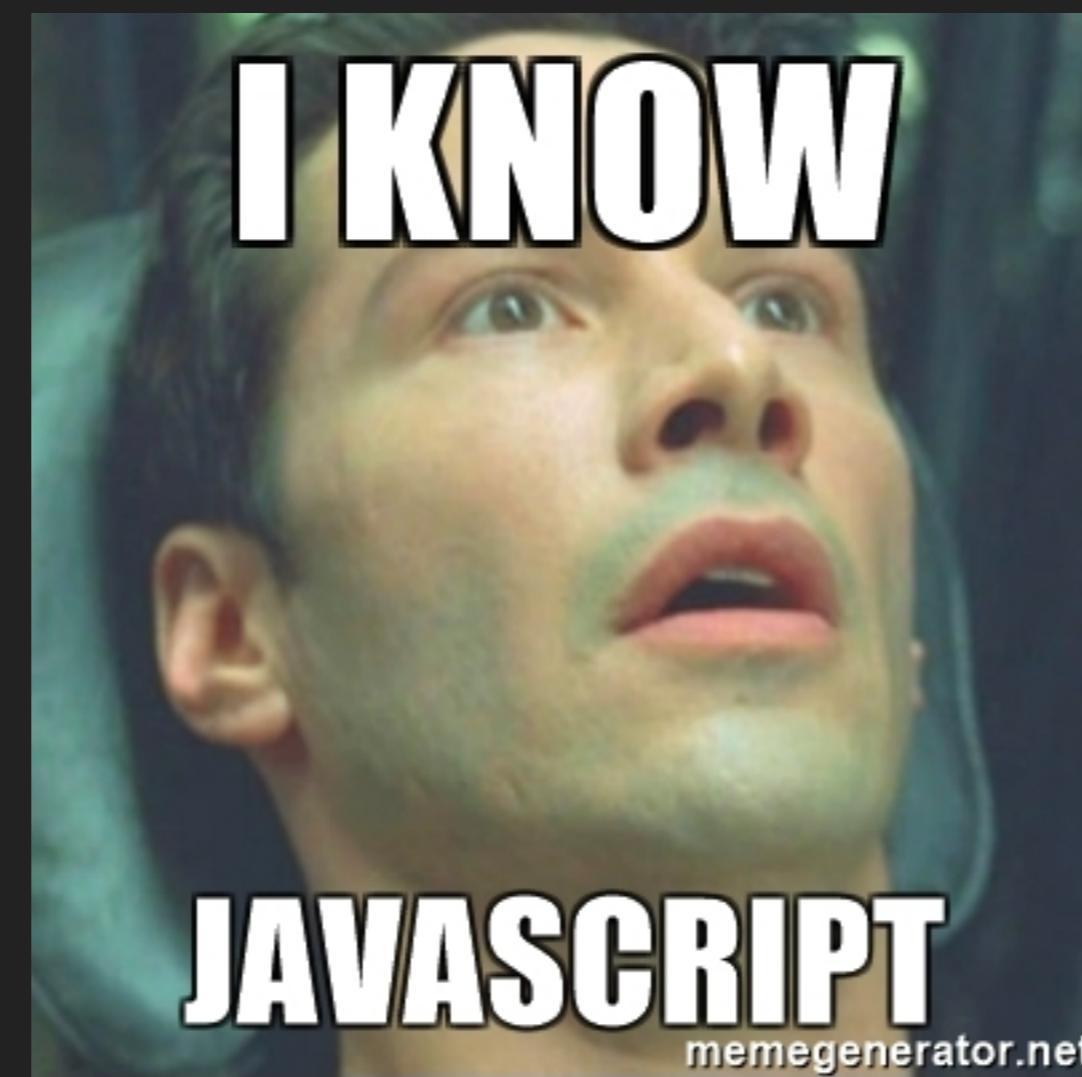
npm

TS



REQUIRE.JS



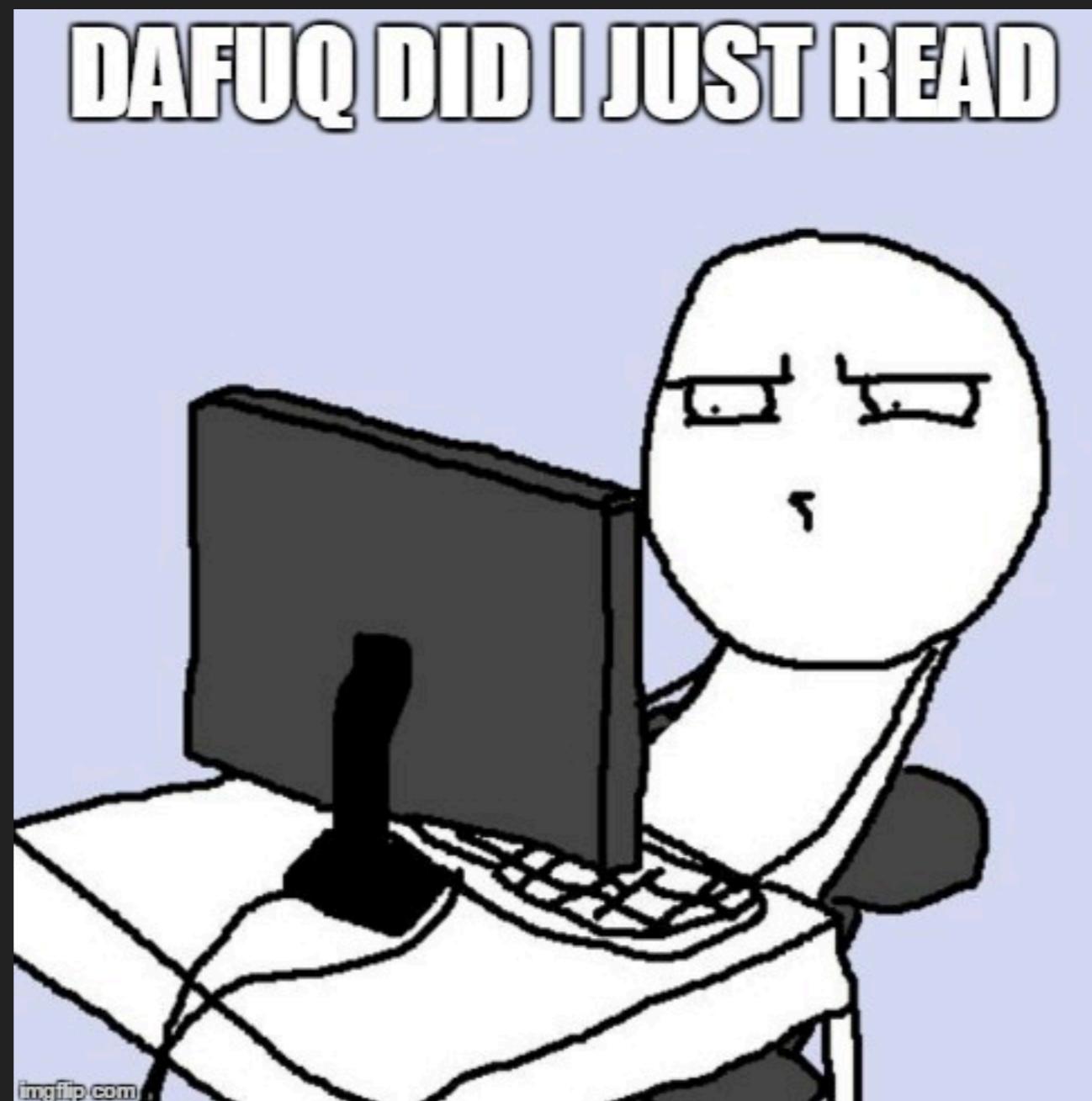




“WHATS IS JAVASCRIPT?”

aaaa...hmmm..haaa...

A
SINGLE-THREADED
NON-BLOCKING
ASYNCHRONOUS
CONCURRENT
LANGUAGE



IT HAS
A CALL STACK
AND EVENT LOOP
A CALLBACK QUEUE
& SOME OTHER APIs



CODE

```
1 function getsound() {  
2   return "bow bow!";  
3 }  
4  
5 function speak() {  
6   return getsound();  
7 }  
8  
9 console.log(speak());
```

CALL STACK

getsound()

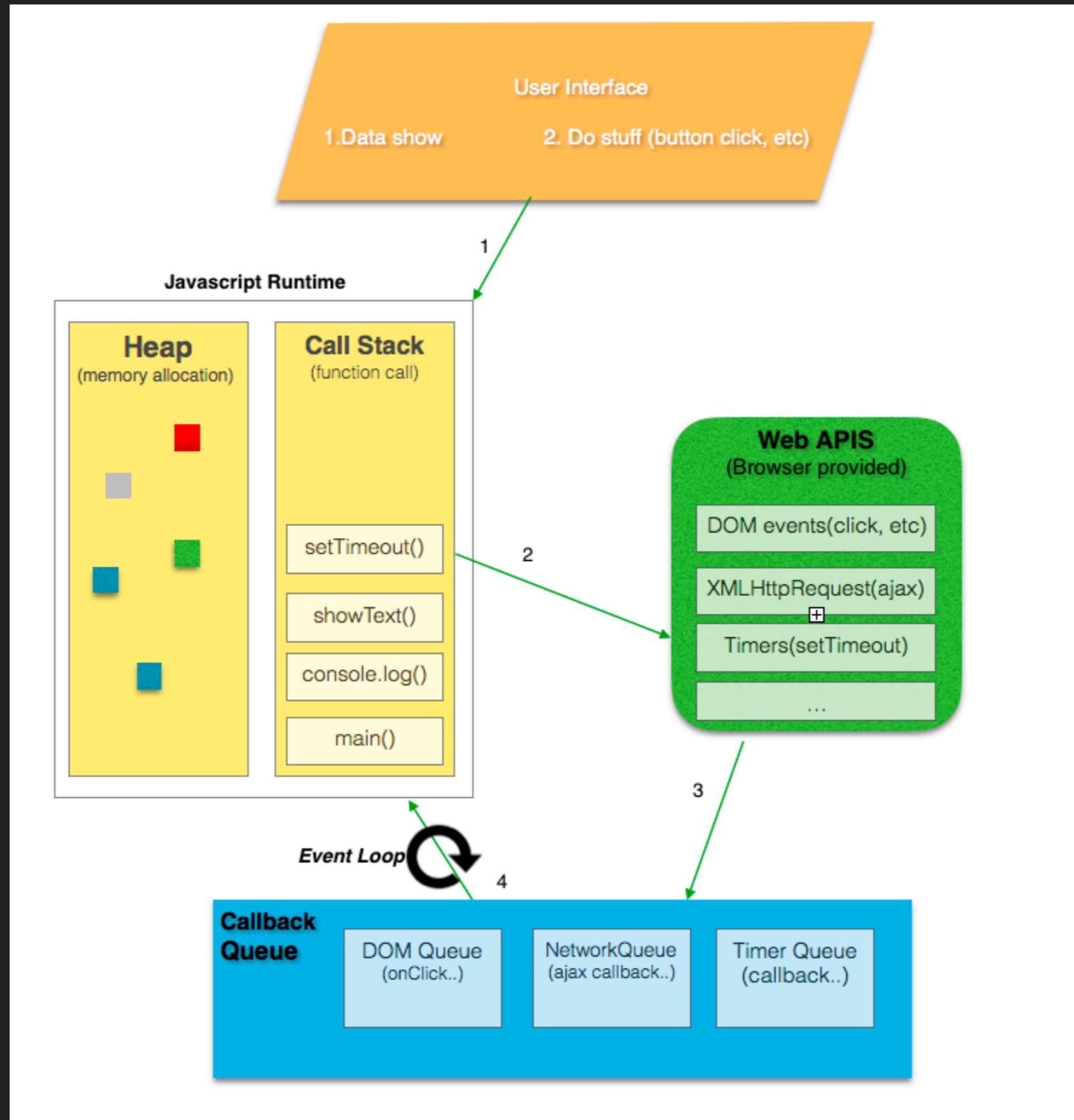
speak()

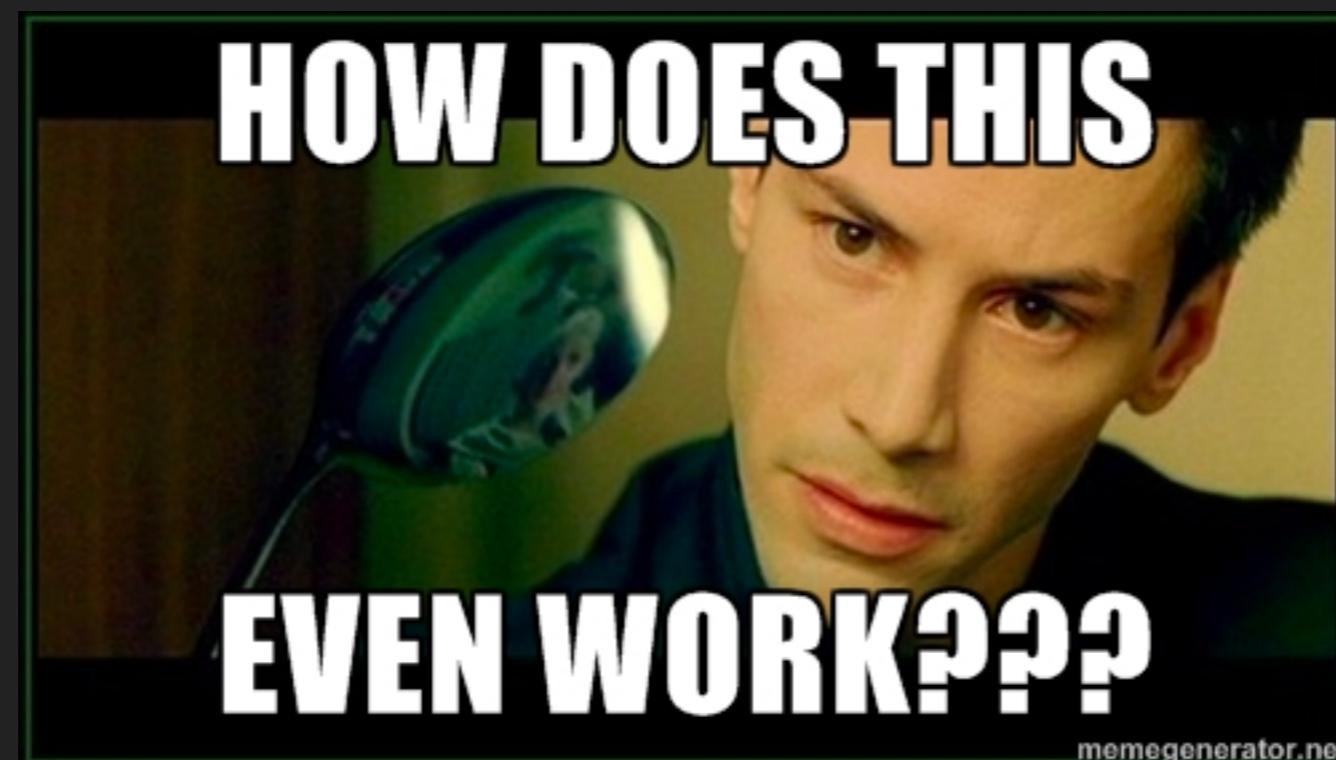
console.log(speak())

main()

OUTPUT

bow bow!





memegenerator.net

YA ...I DON'T BELIEVE YOU...
SHOW PROOF!

Veer

OK!



“PASS BY REFERENCE / VALUE”

Ofcourse its value..isn't it

REFERENCE / VALUE

pass by reference

cup = 

fillCup()

pass by value

cup = 

fillCup()

WHATS THE OUTPUT?

```
1 //Strings , Numbers or Boolean
2 var firstname ="veer";
3 var lastname = firstname
4 firstname="vikas"
5
6 console.log("firstname",firstname);
7 console.log("lastname",lastname);
```

firstname vikas

lastname veer

WHATS THE OUTPUT?

```
1 var dailyfood=["burger","pizza","noodles"];
2
3 var weekendfood=dailyfood;
4
5 weekendfood.push("pav bhaji");
6
7 console.log("weekendfood",weekendfood);
8 console.log("dailyfood",dailyfood);
```

```
weekendfood ► (4) ["burger", "pizza", "noodles", "pav bhaji"]
dailyfood ► (4) ["burger", "pizza", "noodles", "pav bhaji"]
```

WHATS THE OUTPUT?

```
1 var food = {  
2     pav: "bhaji",  
3     puri: "bhaji"  
4 }  
5 var myfood = food;  
6 myfood.puri = "shrikhand";  
7 console.log("food:", food);  
8 console.log("myfood:", myfood);
```

```
food: ▶ {pav: "bhaji", puri: "shrikhand"}
```

```
myfood: ▶ {pav: "bhaji", puri: "shrikhand"}
```

BY VALUE

STRING

NUMBER

BOOLEAN

BY REFERENCE

ARRAY

OBJECT

HOW TO PASS ARRAY BY VALUE

```
1 var dailyfood=["burger","pizza","noodles"];
2
3 //Makes a copy
4 var weekendfood=dailyfood.slice();
5
6 weekendfood.push("pav bhaji");
7 console.log("After First Push..");
8 console.log("weekendfood:",weekendfood);
9 console.log("dailyfood:",dailyfood);
```

It's a shallow copy

Works only for generics i.e string etc, but
not for array of object

SHALLOW COPY

```
1 var dailyfood = ["burger", "pizza", "noodles"] [1 2 3] 1.
```

After First Push..

```
weekendfood: ► (5) ["burger", "pizza", "noodles", Array(3), "pav bhaji"]
```

```
dailyfood: ► (4) ["burger", "pizza", "noodles", Array(3)]
```

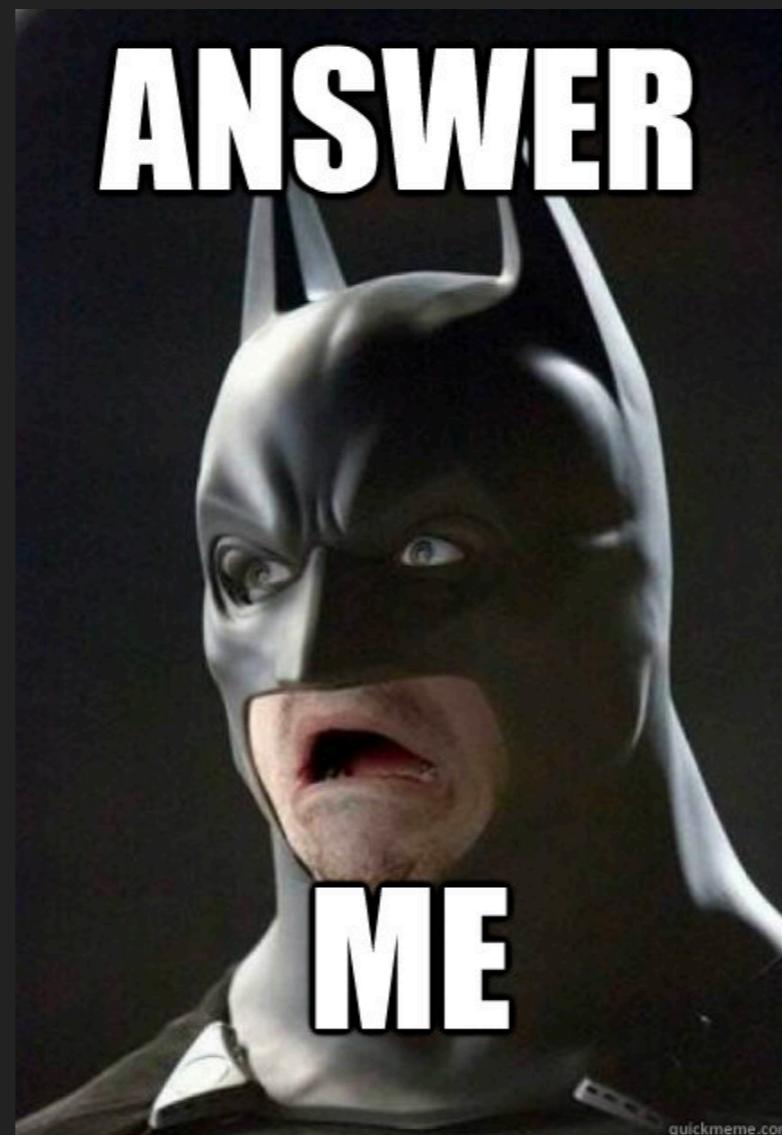
After Second Push..

```
weekendfood: ► (5) ["burger", "pizza", "noodles", Array(4), "pav bhaji"]
```

```
dailyfood: ► (4) ["burger", "pizza", "noodles", Array(4)]
```

```
10
11
12 weekendfood[3].push(4);
13 console.log("After Second Push..");
14 console.log("weekendfood:",weekendfood);
15 console.log("dailyfood:",dailyfood);
```

HOW TO PASS OBJECT BY VALUE



HOW TO PASS OBJECT BY VALUE

```
var food = {  
    pav: "bhaji",  
    puri: "bhaji"  
}  
var myfood = Object.assign({}, food);  
myfood.puri = "shrikhand";  
console.log("food:", food);  
console.log("myfood:", myfood);  
  
food: ► {pav: "bhaji", puri: "bhaji"}  
  
myfood: ► {pav: "bhaji", puri: "shrikhand"}
```

Object.assign() is useful for merging objects or cloning them shallowly.



“THIS”

WTF is this?

WHEN HE SAYS MYSELF HE REALLY MEANS 'THIS'



Allow myself to introduce...

A VARIABLE
WITH THE VALUE
OF THE OBJECT
THAT INVOKES THE FUNCTION

THE VALUE OF THIS
IS BASED ON THE CONTEXT
IN WHICH THE FUNCTION
IS CALLED AT RUNTIME

GRRRRR....STILL NOT
GETTING IT....:(

Veer

WHATS THE OUTPUT?

```
1 var sound = "bow bow";
2 var playSound = function() {
3     console.log("Playing.." + this.sound);
4 }
5
6 var cat = {
7     sound: "meow..meow..",
8     playSound: playSound
9 }
10
11 playSound();
12 cat.playSound();
13
```

Playing..bow bow

Playing..meow..meow..

WHATS THE OUTPUT?

```
1 var dog = {  
2     sound: "bow bow",  
3     bark: function() {  
4         console.log("Barking.." + this.sound);  
5         var barkLoudly = function() {  
6             console.log("Barking Loudly.." + this.sound);  
7         }();  
8     }  
9 }  
10  
11 dog.bark();
```

dog.bark();

Barking..bow bow

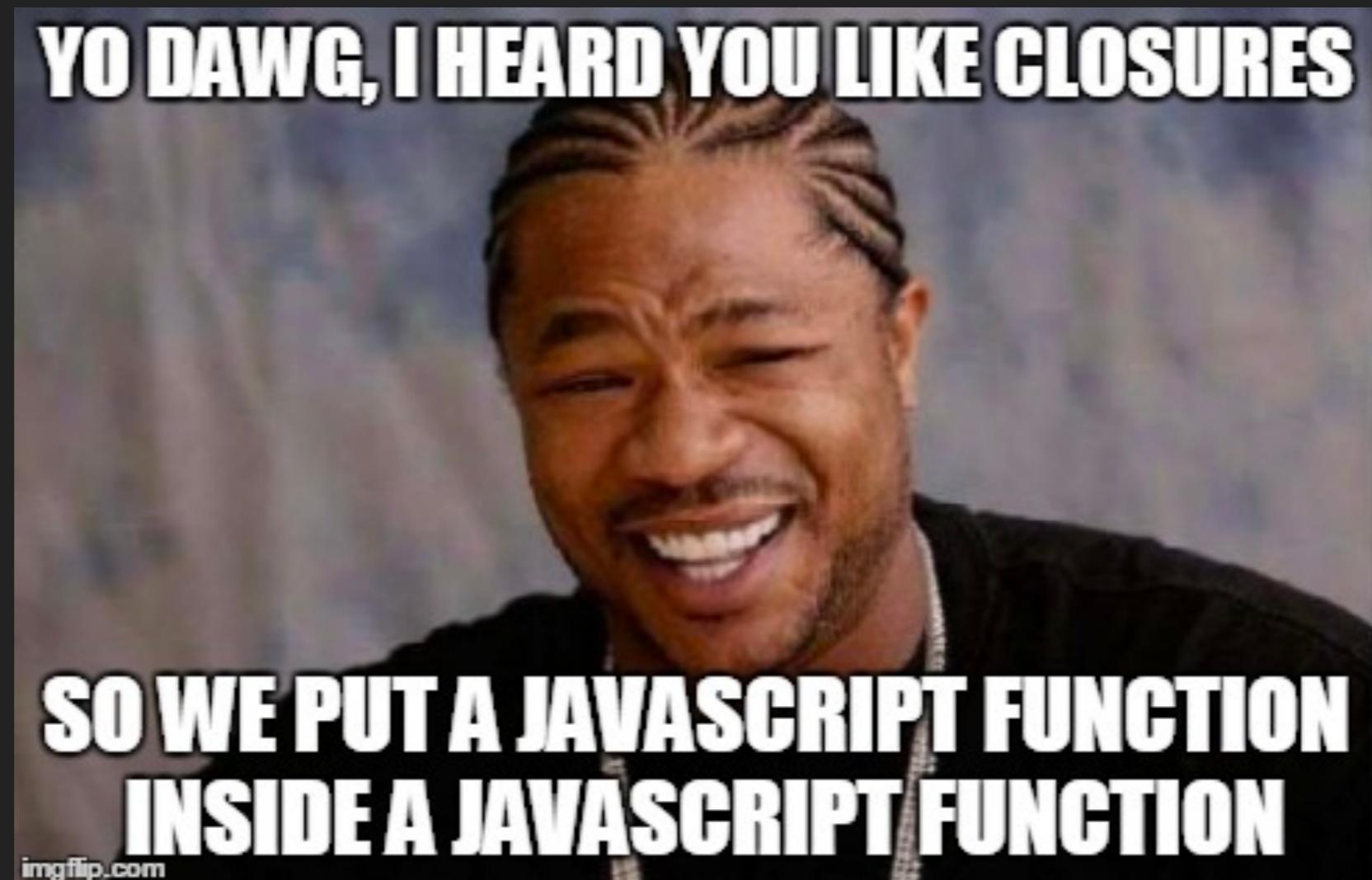
Barking Loudly..undefined





“CLOSURE”

Love this song by
chainsmokers
...Ehh?



A LOCAL VARIABLE OF THE
FUNCTION - KEPT ALIVE AFTER
THE FUNCTION IS RETURNED

THE RETURNED FUNCTION
HAS ACCESS TO THE PARENT SCOPE
EVEN IF
THE PARENT FUNCTION HAS ENDED

GRRRRR....
NO CLOSURE TO THIS....:(

Veer

WHATS THE OUTPUT?

```
1 function makeFun() {  
2     var name = "veer";  
3  
4     function displayName() {  
5         console.log("My name is " + name);  
6     };  
7     return displayName;  
8 }  
9 var boy = makeFun();  
10 boy();|
```

My name is veer

WHATS THE OUTPUT?

```
1 function makeAdder(x) {  
2     return function(y) {  
3         return x + y;  
4     };  
5 }  
6  
7 var add5to = makeAdder(5);  
8 var add100to = makeAdder(100);  
9  
10 console.log(add5to(10));  
11 console.log(add100to(10));
```



“PROTOTYPE”

i won't say a word !

A PROTOTYPE IS A COLLECTION
OF PROPERTIES AND METHODS
THAT CAN BE AUTOMATICALLY ATTACHED TO A
OBJECT WHEN CREATED

EVERY
JAVASCRIPT FUNCTION
HAS A
PROTOTYPE PROPERTY

**PRIMARILY USED FOR
INHERITANCE**

GRRRRR....
NOT ABLE TO INHERIT.... :(

Veer

```
1 var activities = {  
2     speak: function() {  
3         console.log(this.sound);  
4     },  
5     getType: function() {  
6         console.log(this.type);  
7     }  
8 }  
9 function animal(type,sound)  
10 {  
11     this.type=type;  
12     this.sound=sound;  
13 }  
14  
15 animal.prototype=activities;  
16  
17 var doberman = new animal("dog","bow bow");  
18 var veer = new animal("human","bababa–babab–nana");  
19  
20 console.log("doberman:");  
21 doberman.getType();  
22 doberman.speak();  
23  
24 console.log("veer:");  
25 veer.getType();  
26 veer.speak();
```

WHATS THE
OUTPUT?

doberman:
dog
bow bow
veer:
human
bababa–babab–nana

YOU CAN ADD PROPERTIES TO
PROTOTYPE ANY TIME
THE PROTOTYPE CHAIN
WILL FIND THE NEW PROPERTY
AS EXPECTED

```
1 var activities = {  
2     speak: function() {  
3         console.log(this.sound);  
4     },  
5     getType: function() {  
6         console.log(this.type);  
7     }  
8 }  
9  
10 function animal(type, sound) {  
11     this.type = type;  
12     this.sound = sound;  
13 }  
14  
15 animal.prototype = activities;  
16  
17 var doberman = new animal("dog", "bow bow");  
18 var veer = new animal("human", "bababa-babab-nana");  
19  
20 console.log("doberman:");  
21 doberman.getType();  
22 doberman.speak();  
23  
24 console.log("veer:");  
25 veer.getType();  
26 veer.speak();  
27  
28 activities.run = function() {  
29     console.log(this.type + " is running");  
30 }  
31  
32 doberman.run();  
33 veer.run();
```

WHAT'S THE OUTPUT?

doberman:
dog
bow bow
veer:
human
bababa-babab-nana
dog is running
human is running

**YOU CAN EXTEND
NATIVE OBJECTS**

```
Array.prototype.hello = function() {  
    console.log("hello i am array")  
}  
;  
var data = [1, 2, 3, 4];  
data.hello();
```



“MODULE PATTERN”

PATTERNS IN JAVASCRIPT
.SERIOUSLY?

MAINTAINABILITY
NAMESPACING
REUSABILITY

IMMEDIATELY INVOKING FUNCTION EXPRESSION (IIFE)

```
(function() {  
    console.log("I am invoked")  
}());
```

GLOBAL VARIABLE IMPORT

```
var globalvar = [1, 2, 3];
(function(a) {
    console.log("I am using global variable" + a.length);
}(globalvar));
```

OBJECT INTERFACE

```
var animal = (function(s) {
    var sound = s;
    return {
        playSound: function() {
            console.log(sound);
        }
    }
}("bow bow"))
console.log("Access Sound:" + animal.sound);
animal.playSound();
```

Trying to access sound undefined
bow bow

COMMONJS MODULE (NODE JS)

```
function myModule() {  
  this.hello = function() {  
    return 'hello!';  
  }  
  
  this.goodbye = function() {  
    return 'goodbye!';  
  }  
  
  module.exports = myModule;  
}
```

```
var myModule = require('myModule');  
  
var myModuleInstance = new myModule();  
myModuleInstance.hello(); // 'hello!'  
myModuleInstance.goodbye(); // 'goodbye!'
```

Explicit dependencies
Loads module synchronously



AMD (ASYNCHRONOUS MODULE DEFINITION)

```
1 define(['myModule', 'myOtherModule'], function(myModule, myOtherModule) {  
2     ....  
3     console.log(myModule.hello());  
4 });
```

Explicit dependencies
Loads module asynchronously

WAKE HIM UP!



© The White House



“FUNCTIONS”

Ahh! I know this
Don't I?

FUNCTION CONSTRUCTOR

Every JavaScript function is actually a `Function` object.

Syntax

```
new Function ([arg1[, arg2[, ...argN]],] functionBody)
```

Parameters

`arg1, arg2, ... argN`

Names to be used by the function as formal argument names. Each must be a string that corresponds to a valid JavaScript identifier or a list of such strings separated with a comma; for example "`x`", "`theValue`", or "`a,b`".

`functionBody`

A string containing the JavaScript statements comprising the function definition.

FUNCTION CONSTRUCTOR

```
1 var playSong = new Function(  
2   "line1",  
3   "line2",  
4   "line3",  
5   "return line1+' '+line2+' '+line3"  
6 );  
7 console.log(playSong("tamma", "tamma", "looge"));
```

Can be used instead of eval.

Jquery Uses to convert JSON String to Object

BIND

```
1 var pokemon = {  
2   firstname: 'Pika',  
3   lastname: 'Chu '  
4 };  
5  
6 var pokemonName = function() {  
7   var fullname = this.firstname + ' ' + this.lastname;  
8   console.log(fullname+ 'I choose you!');  
9 };  
10  
11 // creates new object and binds pokemon.  
12 // 'this' of pokemon === pokemon now  
13 var logPokemon = pokemonName.bind(pokemon);  
14  
15 logPokemon(); // 'Pika Chu I choose you!'
```

When called, has its 'this' keyword set to the provided value

It explicitly lets you define the value of 'this'

CALL / APPLY

```
1 ▼ var pokemon = {  
2     firstname: 'Pika',  
3     lastname: 'Chu'  
4 };  
5  
6 ▼ var pokemonName = function(snacks,hobby) {  
7     var fullname = this.firstname + ' ' + this.lastname;  
8     console.log(fullname+ " loves "+snacks+" and "+hobby);  
9 };  
10  
11 pokemonName.call(pokemon,'sushi','algorithms');  
12 pokemonName.apply(pokemon,['sushi','algorithms']);|
```

call() method calls the function with a given this value and arguments provided individually

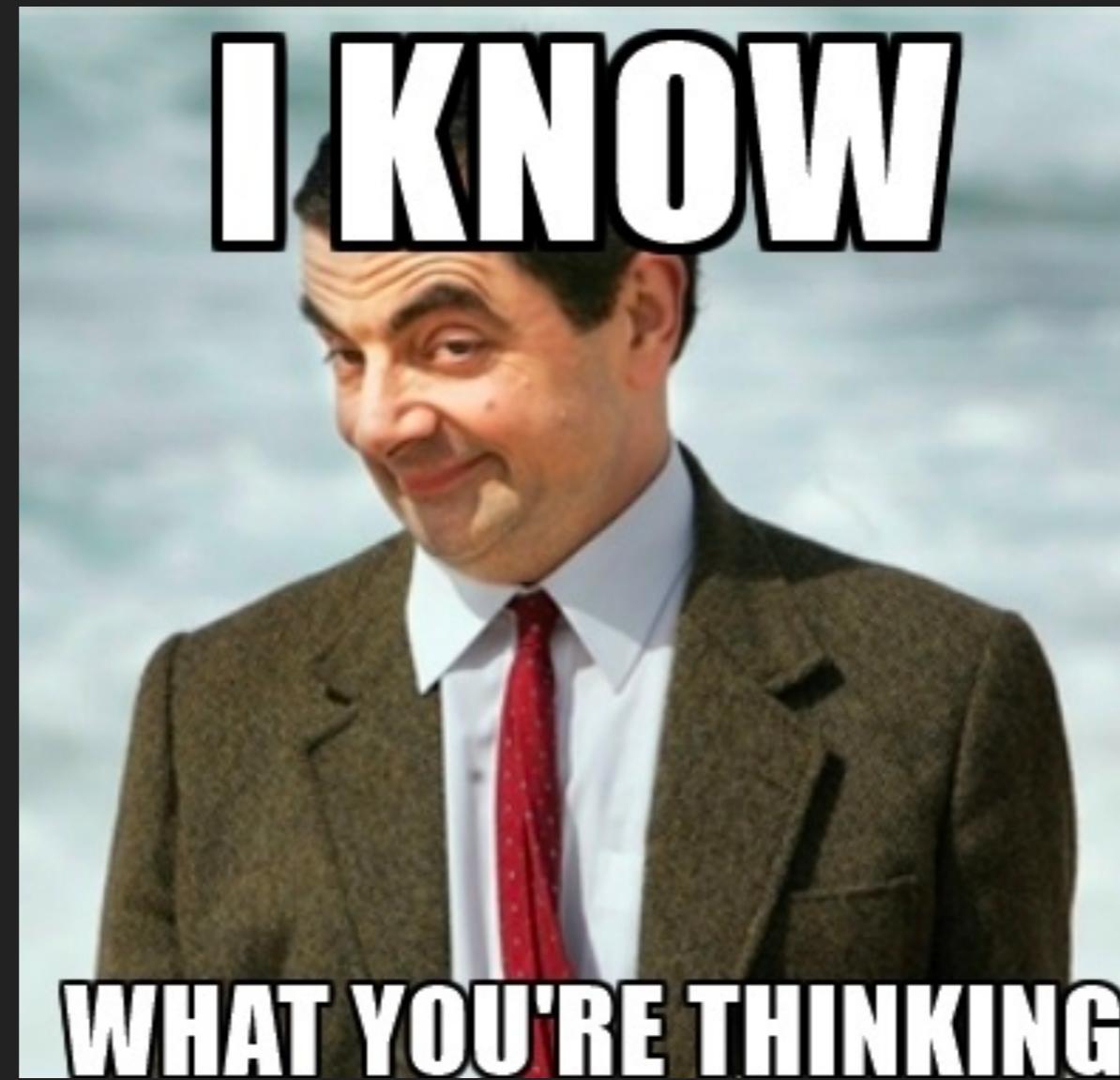
apply() method calls the function with a given this value and an array of all arguments

DIFFERENCE BIND & CALL/APPLY

Call accepts additional parameters

Call executes the function right away

Call does not make a copy of the function it is being called on



LETS TAKE A BREAK!

Vikas

Web Developer



What my friends think I do



What my Mum thinks I do



What society thinks I do



What my boss thinks I do



What I think I do



What I actually do

WEB DEVELOPER WITH A JOB



WEB DEVELOPER WITHOUT A JOB



BIG CLAP FOR PAKYA...

BUS KARO
YAARO
OUR KITNI
MAROGE

THANKS FOR BEING A SPORT



“EVAL”

I Heard its Evil..

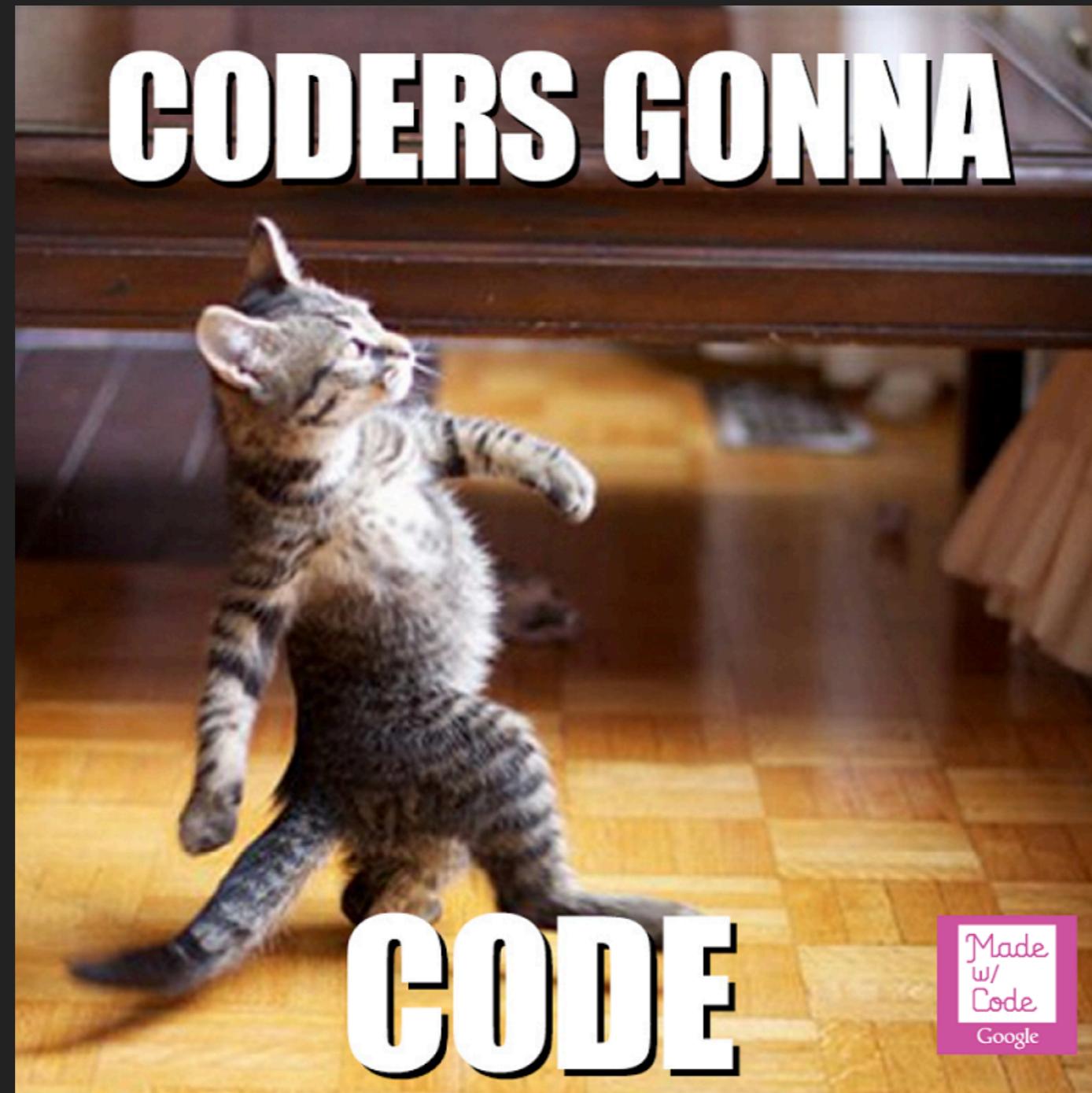
CHECK THIS FOR MORE INFO

Click



“CLEAN CODE”

Swach Code Abhiyaan :P



RETHINK LOOP

Lets forget for loop

```
1 var people = [  
2   {name:"Veer, Prabhu", age:2,gender:"M" ,occupation:"dancer"},  
3   {name:"Vikas, Prabhu", age:34,gender:"M",occupation:"boss"},  
4   {name:"Mohini, Memane", age:25,gender:"F",occupation:"coder"},  
5   {name:"Rahul, Nair", age:3000,gender:"M",occupation:"robot"},  
6   {name:"Devendra, Walnaj", age:25,gender:"M",occupation:"scientist"}  
7 ];
```

RETHINK LOOP-FILTER

```
9 //Filter for people eligible for voting
10 var voters = people.filter(function(person) {
11   return person.age > 18 ? true : false;
12 })
13 console.log("Voters");
14 console.table(voters);
```

RETHINK LOOP-MAP

```
16 //Get full names with occupation
17 var descriptions = people.map(function(person)
18 {
19     return person.name +" is a "+person.occupation;
20 });
21 console.log("Descriptions");
22 console.table(descriptions);
```

RETHINK LOOP-SORT

```
25 //Sort by age or each person
26 var youngtoolder=people.sort(function(last,next){
27   return (last.age>next.age)? 1:-1;
28 })
29 console.log("Younger");
30 console.table(youngtoolder)
```

RETHINK LOOP-REDUCE

```
33 //get the total age
34 var totalage = people.reduce(function(total, person) {
35     return total + person.age
36 }, 0)
37 console.log("Total Age:" + totalage);
```

RETHINK LOOP - SUMMARY

map, filter, and reduce
explained with emoji 😂

```
map([🐮, 🍟, 🐔, 🌽], cook)  
=> [🍔, 🍟, 🍗, 🍿]
```

```
filter([🍔, 🍟, 🍗, 🍿], isVegetarian)  
=> [🍟, 🍿]
```

```
reduce([🍔, 🍟, 🍗, 🍿], eat)  
=> 💩
```

RETHINK LOOP - TASKS

Get people with gender male & scientist

Sort by last name

Get total count of male & female

RETHINK IF - TERNARY

if else pattern

```
1 function postTransaction() {  
2  
3     if (isTransactionvalid()) {  
4         return saveTransaction();  
5     } else {  
6         return rejectTransaction();  
7     }  
8 }
```

condition ? expr1 : expr2

```
11 function postTransaction() {  
12     return isTransactionvalid() ?  
13         saveTransaction() : rejectTransaction();  
14 }
```

RETHINK IF - TERNARY

What about else if

```
17 function postTransaction(transdata)
18 {
19     if(transdata.assetclass=="MF"){
33 function postTransaction(transdata)
34 {
35     return
36     transdata.assetclass=="MF" ? saveMFTransaction(transdata);
37     transdata.assetclass=="EQ" ? saveEQTransaction(transdata);
38     transdata.assetclass=="DEPO" ? saveDEPOTransaction(transdata);
39     : rejectTransaction(transdata);
40 }
41     }
42     else{
43         return rejectTransaction(transdata);
44     }
45 }
```

RETHINK SWITCH

```
1  function getDataset(transdata)
16 var dataset={
17   "EQ":getEQData,
18   "MF":getMFData,
19   "DEP0":getDEP0Data,
20   "default":getBlankData
21 }
22 function getDataset(transdata)
23 {
24   return
25   dataset[transdata.assetclass]
26   ?dataset[transdata.assetclass].call(this,transdata);
27   :dataset.default.call(this.transdata)
28 }
```

14 ↴



“DEBUG”

Its not a bug..its a feature



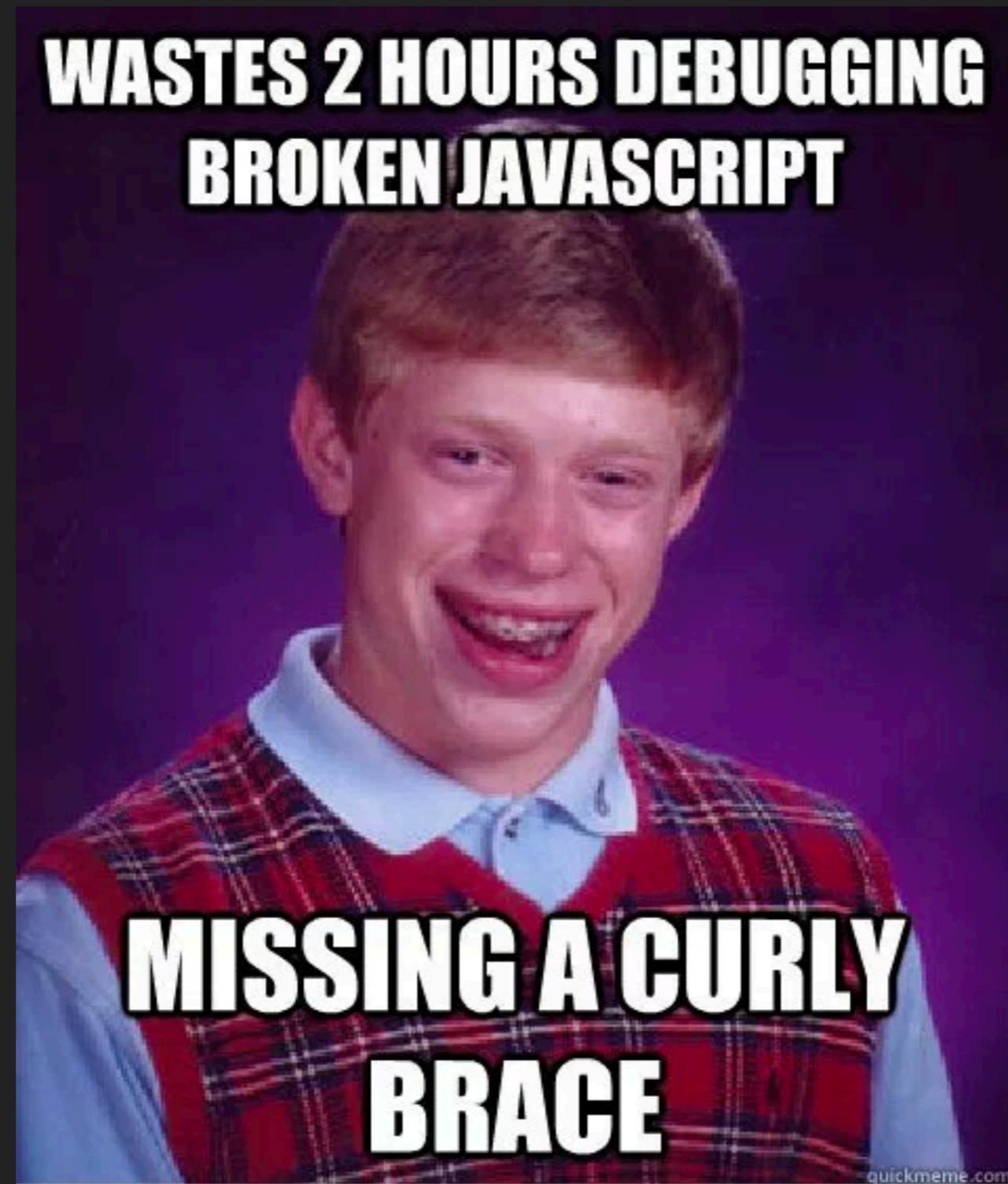
DEBUGGING

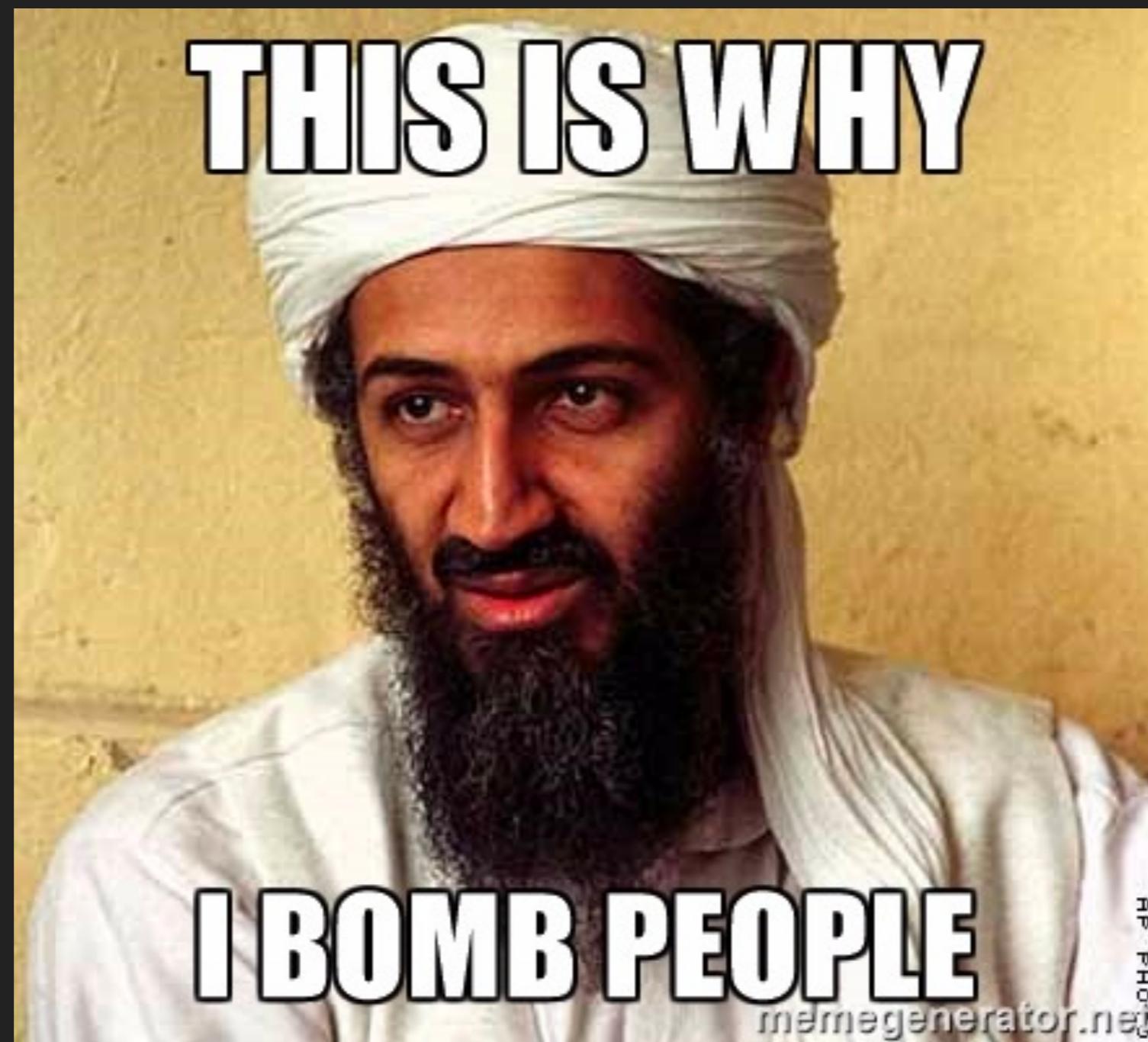


I DON'T KNOW WHERE YOU ARE, I DON'T KNOW HOW YOU WORK,
BUT I WILL FIND YOU AND
I WILL FIX YOU

HOW WILL YOU FIX IT

ADD ALERT AT EACH LINE.









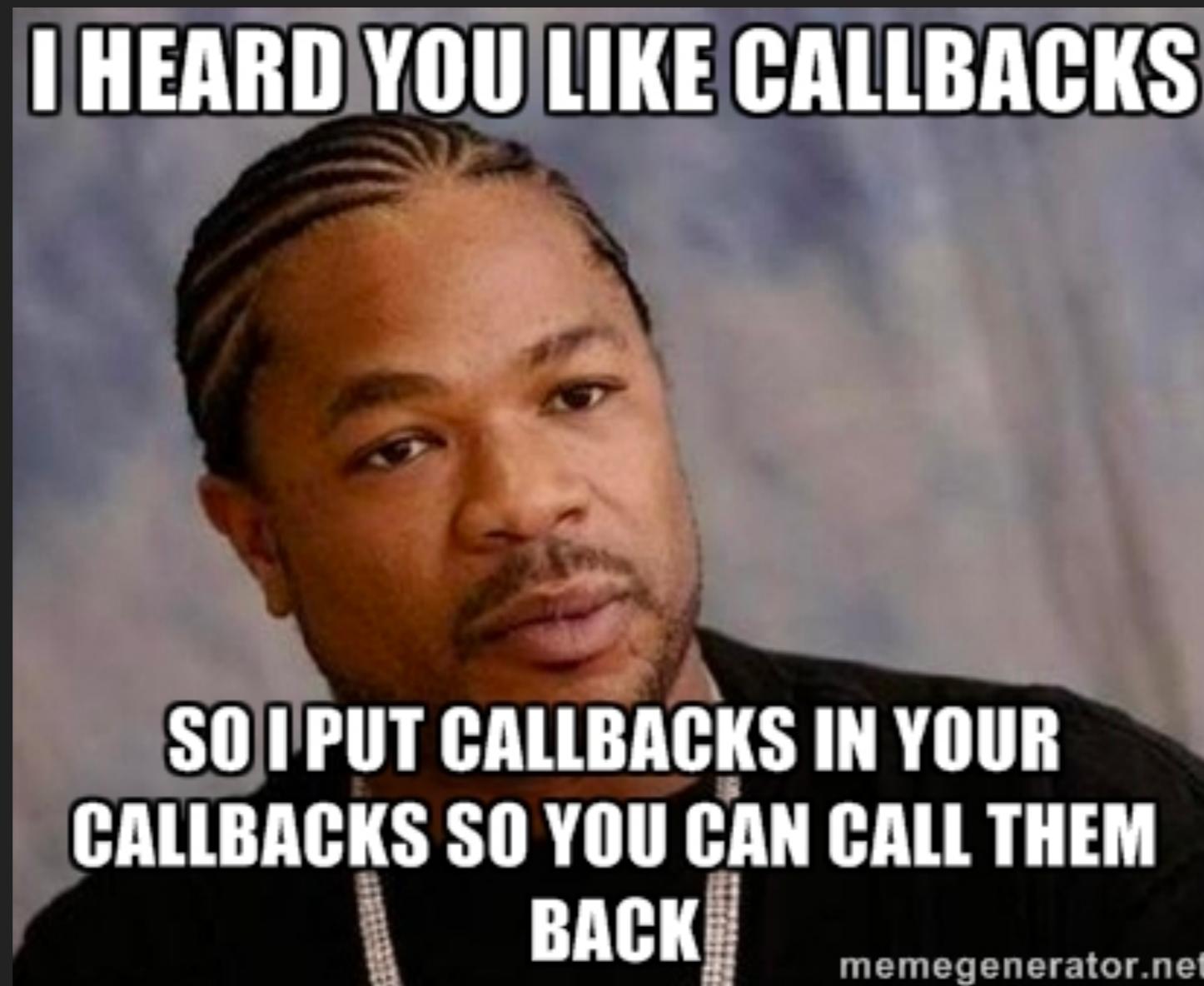
LETS GO TO
CHROME DEVELOPER TOOLS



“CALLBACK HELL”

Ohhhhh!







```
a(function (resultsFromA) {  
  b(resultsFromA, function (resultsFromB) {  
    c(resultsFromB, function (resultsFromC) {  
      d(resultsFromC, function (resultsFromD) {  
        e(resultsFromD, function (resultsFromE) {  
          f(resultsFromE, function (resultsFromF) {  
            console.log(resultsFromF);  
          })  
        })  
      })  
    })  
  })  
});
```



WHAT IS A PROMISE?

A OBJECT THAT MAY PRODUCE A
SINGLE VALUE IN THE FUTURE

A PROMISE IS AN
ASYNCRONOUS VALUE

PROMISE HAS 3 STATES

FULFILLED
REJECTED
PENDING



CREATE PROMISE

```
1 var pinkypromise = new Promise(function(resolve, reject) {  
2     setTimeout(function() {  
3         resolve("Hi dad, i kept my promise");  
4     }, 1000);  
5 });
```

CALL PROMISE

```
8 pinkypromise
9   .then(function(res) {
10     console.log(res);
11     console.log("Good Job");
12   })
13   .catch(function(res){
14     console.error("Please keep your promise");
15   })
```

PROMISE CHAINING

```
17 pinkypromise
18     .then(function(res) {
19         console.log(res);
20         return Promise.resolve("Good Job");
21     })
22     .then(function(res) {
23         console.log(res)
24         return new Promise(function(resolve, reject) {
25             setTimeout(function() {
26                 reject("Opps Dad, i broked my promise")
27             }, 500)
28         })
29     })
30     .then(function(res) {
31         console.log("Please keep your promise .. fingers crossed")
32     })
33     .catch(function(err) {
34         console.error(err);
35         console.log("Ok try next time.")
36     })
```

MULTIPLE PROMISE

```
65 //Multiple Promise
66 Promise.all( [pinkypromise, didhomework] )
67     .then(function(data) {
68         |   console.table(data);
69     })
70     .catch(function(err) {
71         |   console.error(err)
72     })
```

ASYNC AWAIT

```
75 //Async Await
76 async function asyncawait()
77 {
78     try
79     {
80         var promise1 = await pinkypromise;
81         var promise2 = await didhomework;
82         var promise3 = await getupearly(promise1+"\n"+promise2);
83         console.log(promise3);
84     }
85     catch(e)
86     {
87         console.error(e);
88     }
89 }
90 }
91 asyncawait();
```

“ES6”

WOW!

ARROW FUNCTION

```
1 //ES5
2 function Bored(name)
3 {
4     return name+" is bored";
5 }
6
7 //ES6
8 const Bored =(name)=>name+" is bored";
9
10 Bored("Pakya");
```

No need to specify function keyword

Implicit return at last line

Brings clarity & code reduction

TEMPLATE LITERALS

```
1 //ES5
2 function Bored(name)
3 {
4     return name+" is bored";
5 }
6
7 //ES6
8 const Bored =(name)=>`name is bored`;
9
10 Bored("Pakya");
```

Use the tilde sign to enclose the string

No more + sign or " for concatenation

All scope variables can be accessed

SPREAD OPERATOR

```
19 //Es6 Spread Operator
20 function length(...nums) {
21   console.log(nums.length);
22 }
23 length(3,4,5,6,7,8) // 6;
24
25
26 function total(x, y, z) {
27   console.log(x + y + z);
28 }
29 total(1,2,3);
30 total.apply(null, [1,2,3]);
31 total(...[1,2,3])
```

MANIPULATING OBJECTS

```
1 //ES5 Object copy
2 var obj1 = { a: 1, b: 2 }
3 var obj2 = { a: 2, c: 3, d: 4}
4 var obj3 = Object.assign(obj1, obj2)
```

```
6 //ES6 Object copy
7 const obj1 = { a: 1, b: 2 }
8 const obj2 = { a: 2, c: 3, d: 4}
9 const obj3 = {...obj1, ...obj2}
```

```
11 //ES5 Object Extracting
12 var obj1 = { a: 1, b: 2, c: 3, d: 4 }
13 var a = obj1.a
14 var b = obj1.b
15 var c = obj1.c
16 var d = obj1.d
```

```
18 //ES6 Object Extracting
19 const obj1 = { a: 1, b: 2, c: 3, d: 4 }
20 const {
21   a,
22   b,
23   c,
24   d
25 } = obj1
```

```
27 //ES5 Object Assignment
28 var a = 1
29 var b = 2
30 var c = 3
31 var d = 4
32 var obj1 = { a: a, b: b, c: c, d: d }
```

```
34 //ES6 Object Assignment
35 var a = 1
36 var b = 2
37 var c = 3
38 var d = 4
39 var obj1 = { a, b, c, d }
```

MODULES

```
1 //ES6 Export Module
2 var myModule = { x: 1, y: function(){ console.log('This is ES5') }}
3 module.exports = myModule;
4
5 //ES6 Export Module
6 const myModule = { x: 1, y: () => { console.log('This is ES5') }}
7 export default myModule;
8
9
10 //ES5 Module Import
11 var myModule = require('./myModule');
12
13 //ES6 Module Import
14 import myModule from './myModule';
15
```



“BACKBONEJS”

“Backbone is not a complete framework. It's a set of building blocks. It leaves much of the application design, architecture and scalability to the developer, including memory management, view management, and more.”

-Derick Bailey



BACKBONE.JS

WHAT IT IS?

Provides client side app structure

It contains Models to represent data

It contains Views to hook up Models to the DOM

Synchronises data to/from server

IT'S A
MV* FRAMEWORK

MODEL, VIEW & *

MODEL

Application data and business rules

It also contains events which notifies any change in data

Views are updated using these event notifications

This gives you one source of truth, which is not the user interface.

VIEW

User interacts with View

It observes any data change event in model

It reads and edits Model

ROUTER

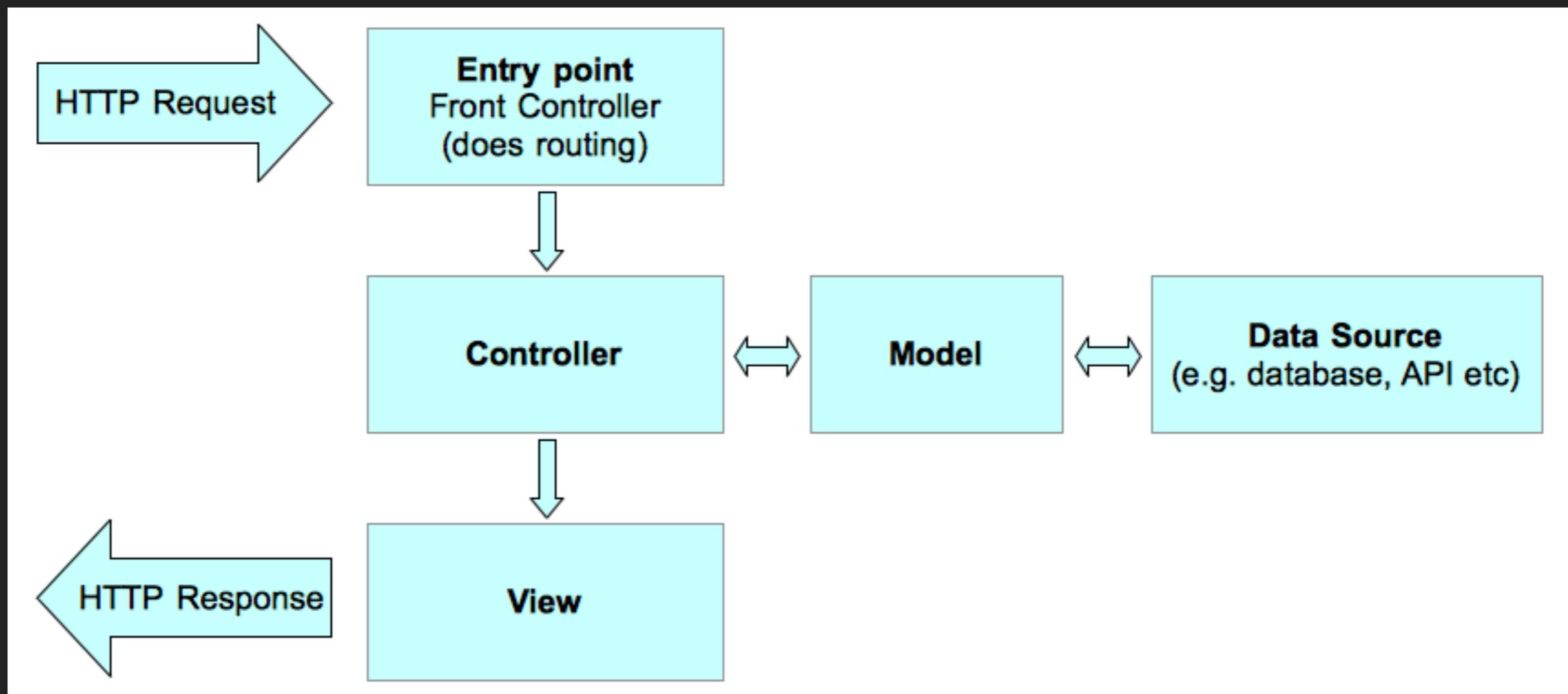
Everything after the hashtag is considered as router

Maps your URL to function

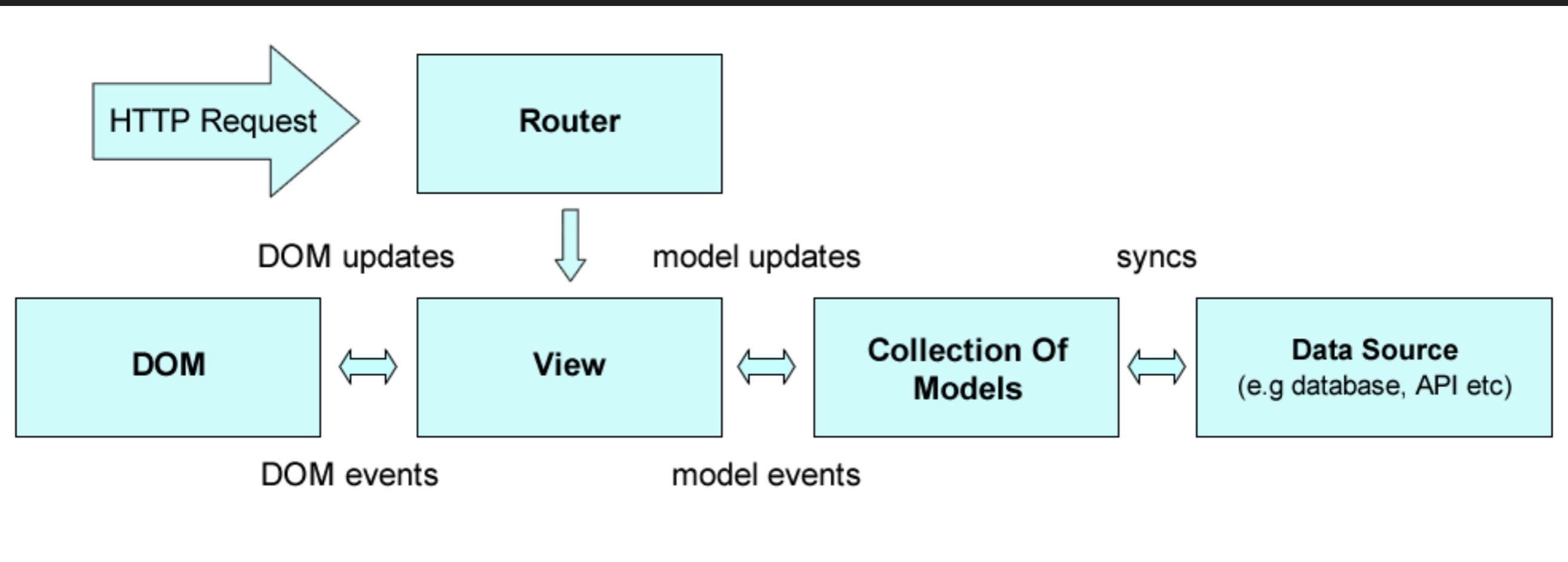
Manages application state like bookmarking a particular view



HTTP REQUEST/RESPONSE LIFECYCLE FOR SERVER-SIDE MVC



MVC AS IMPLEMENTED BY BACKBONEJS



DEPENDENCIES

JQUERY & underscore

Backbone MVC Architecture

