

Learn





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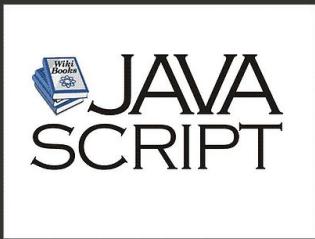
Schedule I

- 9:00am - 10:00am Intro to Node, Modules, Events, Async, NPM (*1 hour*)
- 10:00am - 11:00am Lab #1 (*1 hour*)
- 11:00am - 12:00am Power tools - GruntJS, Bower, Yeoman, Gulp (*1 hour*)
- 12:00am - 12:30pm Lab #2 + Lunch (*30 minutes*)

Schedule II

- 12:30pm - 1:30pm Lecture #3 - Web Development on the MEAN stack (*1 hour*)
- 1:30pm-2:30pm Lab #3 (*1 hour*)
- 2:30pm - 3:00pm Lecture Lecture #4 Real Time Communication with Socket.IO (*30 mins*)
- 3:00pm - 3:30pm Lab#4 (*30 mins*)
- 3:30pm - 4:00pm Lecture #5 KOA, Sails, Deployment, Ghost, ES6 (*30 mins*)

JavaScript History



```
1  <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
2  <html>
3  <head>
4      <title>Form Validation Example</title>
5      <script>
6      <!--
7          function check_myForm()
8          {
9              var name = new String(document.myForm.name.value);
10             var phone = new String(document.myForm.phone.value);
11             var age = new String(document.myForm.age.value);
12
13             if(name.length < 3 || name.indexOf(' ') == -1)
14             {   alert("Invalid Name"); return false; }
15
16             if( (phone.length != 12) || (phone.charAt(3) != '-') || (phone.charAt(7) != '-') )
17             {   alert("Invalid Phone Number"); return false; }
18
19             if(age > 65 || age < 21)
20             {   alert("Invalid Age, Must be between 21-65"); return false; }
21             alert("Form Data Validated, no problems found");
22             JavaScript:document.myForm.submit();
23         }
24     //-->
25     </script>
26 </head>
27 <body>
28 <form name="myForm" action="http://www.profiler.noaa.gov/jsp/FormTester.jsp">
29     Enter Your Name:<input type="text" name="name" size="40"> (First and Last)<br>
30     Phone Number:<input type="text" name="phone" size="14"> (###-###-####)<br>
31     Age:<input type="text" name="age" size="4"> (between 21 - 65)<br>
32     <input type="button" value="Validate Form Data" onClick="check_myForm()">
33 </form>
34 </body>
35 </html>
```

JavaScript Today



What is Node JS?

- *Out of Browser* JavaScript Runtime
- Built on V8
- Non Blocking ,Event Driven
- Windows, Linux, Mac
- Open Source

What can you build with Node?

- Web Applications
- Application Servers (networking)
- Desktop applications
- Command line utilities

Who uses Node?



The New York Times



YAHOO!



LinkedIn

U B E R



DOW JONES

STRONGLoop



Function Declaration

```
function Add(a, b) {  
    return a + b;  
}
```

Function Declaration

```
function Add(a, b) {  
    return a + b;  
}
```

Function Declaration

```
Add(5, 4);
```

```
function Add(a, b) {  
    return a + b;  
}
```

```
Add(5, 4);
```

Function Expression

~~Add(5, 4);~~

```
var Add = function(a, b) {  
    return a + b;  
};
```

Add(5, 4);

Anonymous Functions

```
function(a, b) {  
    return a + b;  
};
```



$f(g(x))$

Y O D A W G

We heard you like functions so we put a function in your function so
you can derive while you derive!

```
$(".someClass").click(function () {  
    //do stuff  
});
```

Node is Asynchronous

```
$(".someClass").click(function () {  
    //do stuff  
});
```

```
Add(5, 4);
```

Node is Asynchronous

- Pub/Sub
- Subscribe to events
- Send your own custom events
- EventEmitter
- Alternative to “Callback Soup”

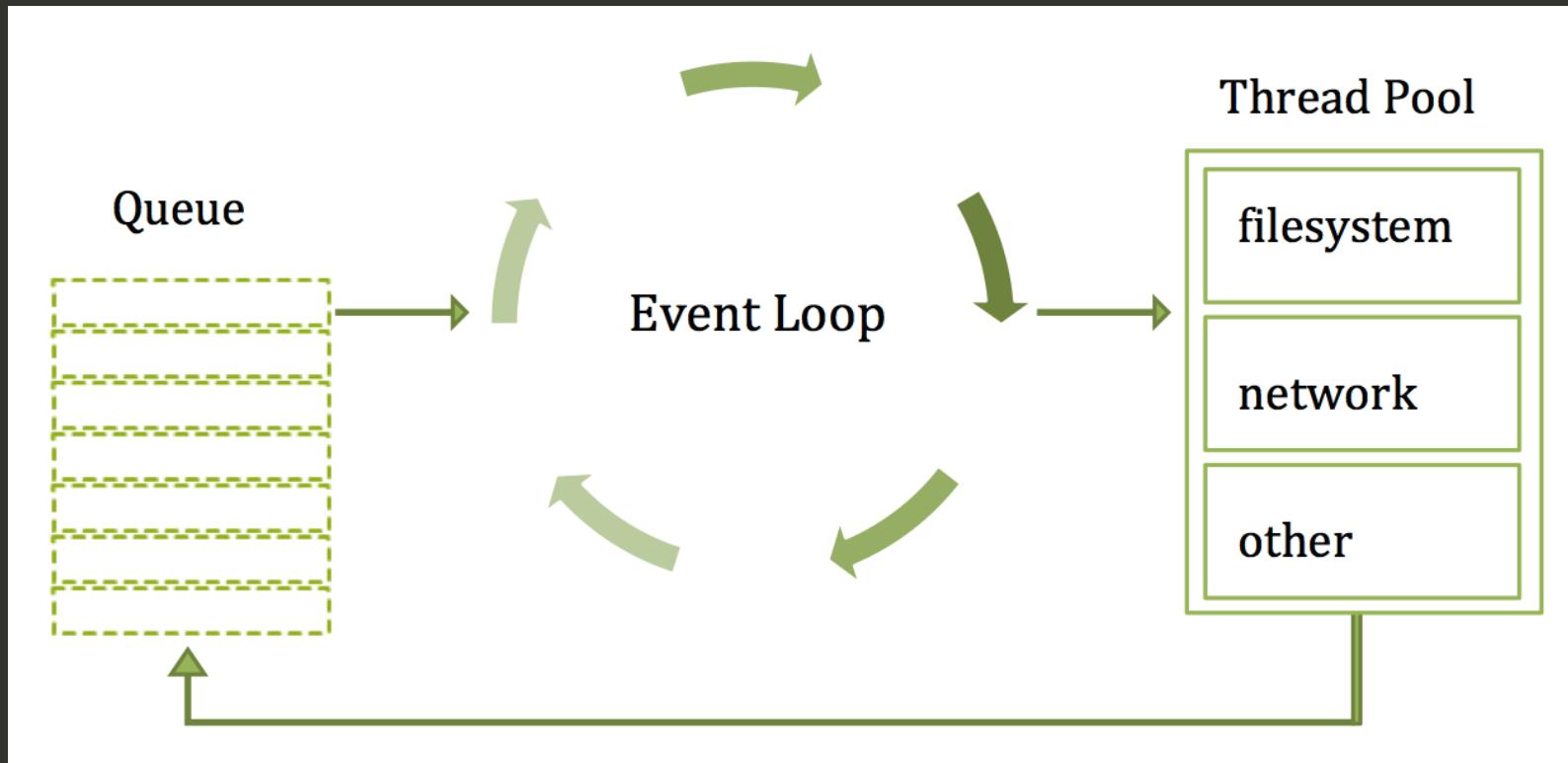
Node Event Loop

- Event Driven Programming
- Single-Threaded Continuous event loop
- Events are fired one at a time
- Non-blocking

Node Event Loop

- Everything except your code is executing in parallel.
- All I/O is evented and asynchronous
- Since Node doesn't spend time waiting for things to finish, it is able to sequentially execute a number of tasks very rapidly
- Small allocation of memory
- JavaScript's language features makes async easier

Events



Events

- Pub/Sub Pattern
- Subscribe to events
- Core libraries emit events
- Send your own custom events
- EventEmitter
- Alternative to “Callback Soup”

Events

```
var events = require('events');

var ee = new events.EventEmitter();

ee.on("someEvent", function () {
    console.log("event has occurred");

});

ee.emit("someEvent");
```

REPL

- Read-Eval-Print-Loop
- Available both as a standalone program and easily includable in other programs.
- Provides a way to interactively run JavaScript and see the results.
- Can be used for debugging, testing, or just trying things out.

NPM

- Node Package Manager
- Comes bundled with Node
- <https://www.npmjs.org/>
- `npm install <package name>`
- Written entirely in JavaScript



DEMO

Node Tooling

- Grunt JS
- Bower
- Yeoman
- Karma
- Gulp

Grunt JS

- JavaScript Task Runner
- CLI (Command Line Interface)
- Automate Repetitive tasks (JS Concat + Minify, Coffee -->JS)
- Live Reload
- Healthy Eco-system



GRUNT

Gulp

- Streaming Build System
- Easy to use
- Easy to Learn
- Fast



Bower

- A client side package manager
- Programmatic API
- Easily install packages
- Many common libraries



Yeoman

- Scaffolding with yo
- community generators
- Faster Development time





DEMO

MEAN

- MongoDB (Document Database)
- Express JS (Server Side Web Framework)
- Angular JS (Client Side Framework)
- Node JS (Core)

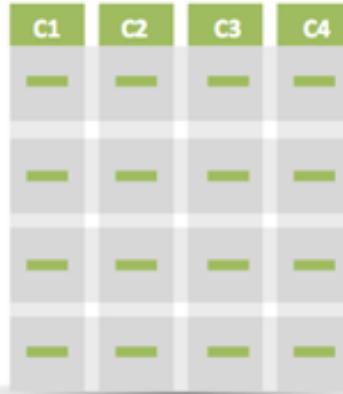


mongoDB



- Open Source Document Database
- NoSql
- Unstructured Data
- Fast and Efficient
- JavaScript as a query language
- Index support

mongoDB



Relational data model

Highly-structured table organization
with rigidly-defined data formats and
record structure.



Document data model

Collection of complex documents with
arbitrary, nested data formats and
varying “record” format.



DEMO

Express JS

- Web Application Framework
- Web Pages + REST API
- Middleware (Connect)
- Flexible



DEMO

Angular JS

- JavaScript Application Framework
- Created by Google
- MVC
- Single Page Applications (SPA)
- Testable



DEMO

SocketIO

- Real time communication between browser and server
- Different transport mechanisms
- Event Driven
- Installed via NPM



SocketIO

DEMO

KOA

- Next Generation Web Framework for Node
- by the folks that brought you Express
- ES6 generators
- Ditch Callbacks
- Similar to Rack with extra stuff

<http://koajs.com/>

<http://bit.ly/koa-steve>

KOA

```
var koa = require('koa');
var app = koa();

// x-response-time

app.use(function *(next){
  var start = new Date;
  yield next;
  var ms = new Date - start;
  this.set('X-Response-Time', ms + 'ms');
});

// logger

app.use(function *(next){
  var start = new Date;
  yield next;
  var ms = new Date - start;
  console.log('%s %s - %s', this.method, this.url, ms);
});

// response

app.use(function *(){
  this.body = 'Hello World';
});

app.listen(3000);
```

KOA

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var koa = require('koa');
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SAILS JS

- Real-time MVC framework for Node
- Automatically generate REST API
- Database agnostic
- Socket.IO

<http://sailsjs.org>

Ghost

- Blogging Platform
- Written in Node
- Open source

<http://ghost.org>

Hosting

- Windows Azure
- Heroku
- Nodejitsu
- Many more...

The End