back-end

Server & Templating

lab 2/8

Stand-up!

Show what you did

issues

feedback

- Werk vanuit **1 repo** voor alle vakken van blok tech
- Ook geen subfolders per vak
- Dubbelcheck **je linkjes** in je issue, en **files op GH**
- Let goed op de **metainfo in package.json**
- Stop node_modules en .DS_Store **in .gitignore**
- **Index.js of server.js** staat in de root van je folder
- Schrijf in **ES6 stijl**
- **Global** versus **local && dep** versus **devdep**

today

I. ~~Stand-up~~

II. Webserver

- Request & Response
- Express
- Routes & Static & 404

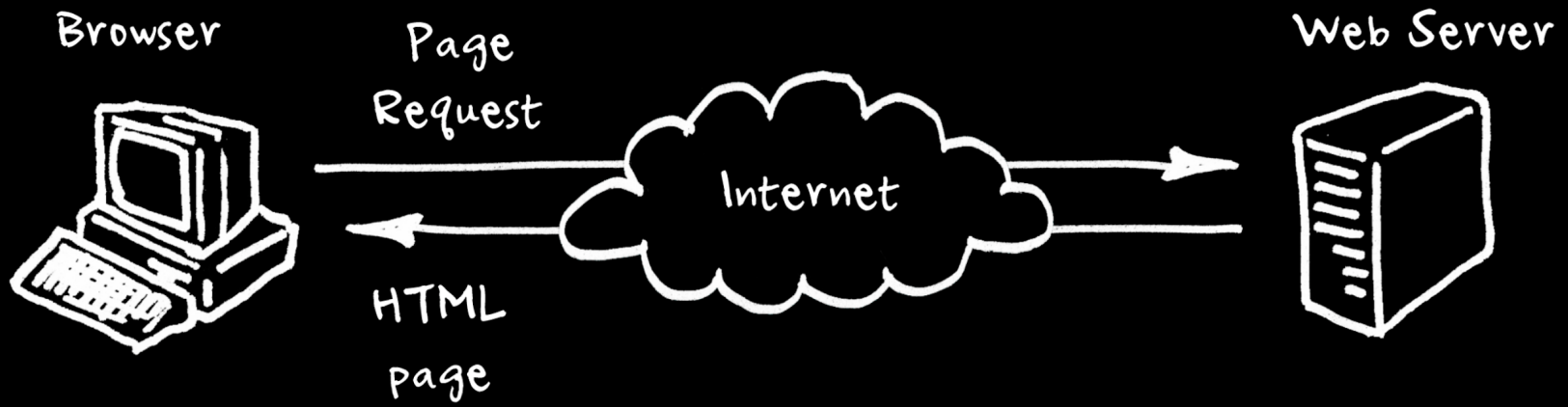
III. Templating

Webserver

Req & Res

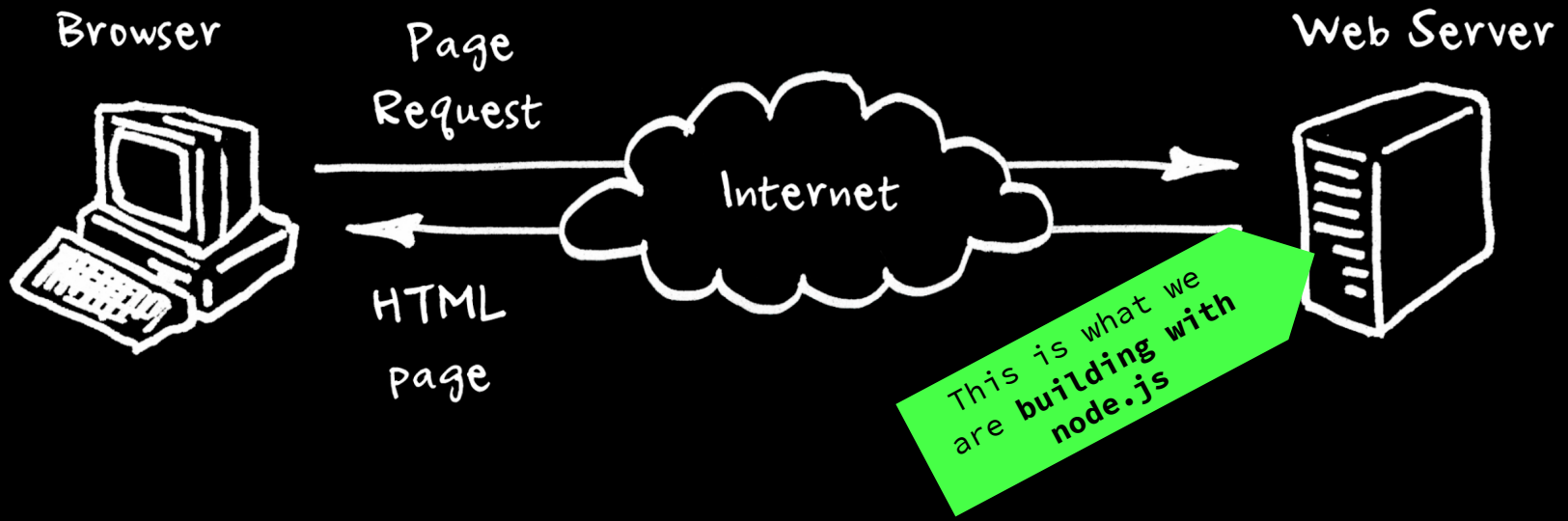
Servers

flow



Servers

flow



Servers

client/server

Client (request)

- Also know as user-agent: acts for the user
- Often a web browser
- Client ask for something: the request

Server (response)

- Connected machine waiting for requests
- Can be one machine, multiple machines, or multiple servers per machine
- Server sends something back: the response

Servers

request url

Servers

response

Servers

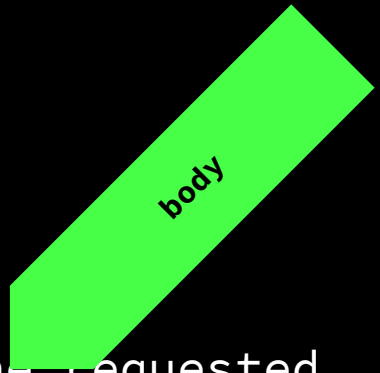
headers

```
HTTP/1.1 200 OK
Date: Mon, 19 Feb 2018 15:40:02 GMT
Last-Modified: Tue, 13 Feb 2018 20:18:22 GMT
Content-Length: 29769
Content-Type: text/html

<!DOCTYPE html… (here comes the 29769 bytes of the requested
web page)
```

Servers

response

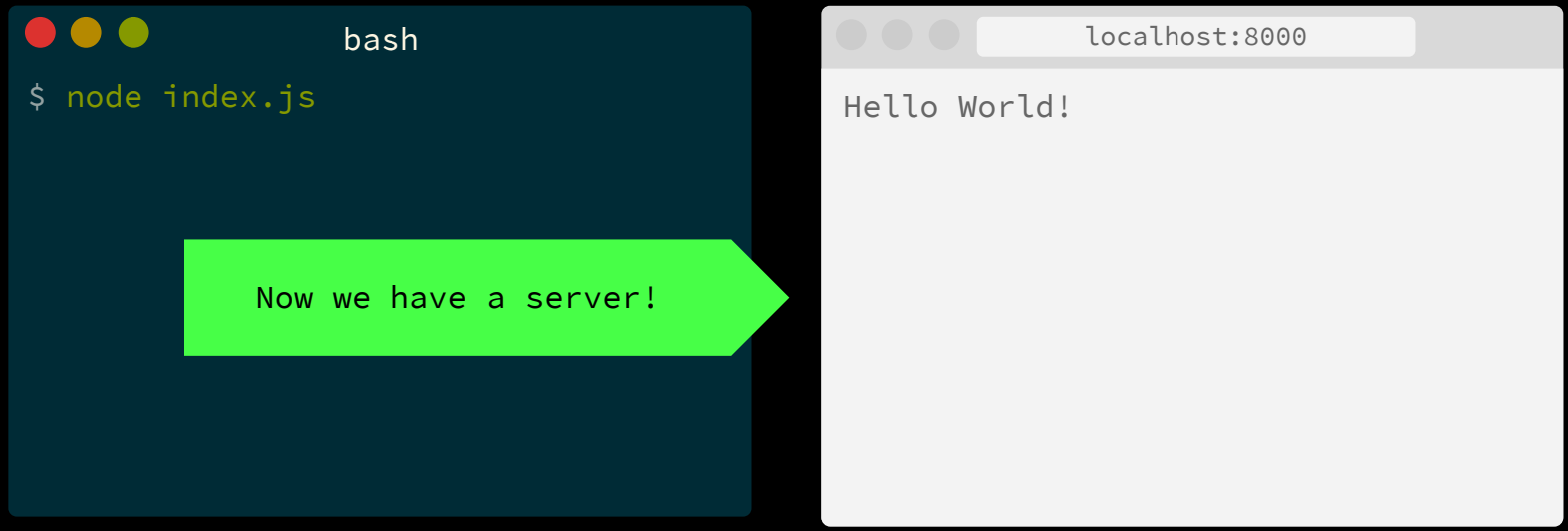
```
HTTP/1.1 200 OK
Date: Mon, 19 Feb 2018 15:40:02 GMT
Last-Modified: Tue, 13 Feb 2018 20:18:22 GMT
Content-Length: 29769
Content-Type: text/html

<!DOCTYPE html… (here comes the 29769 bytes of the requested
web page)
```



index.js

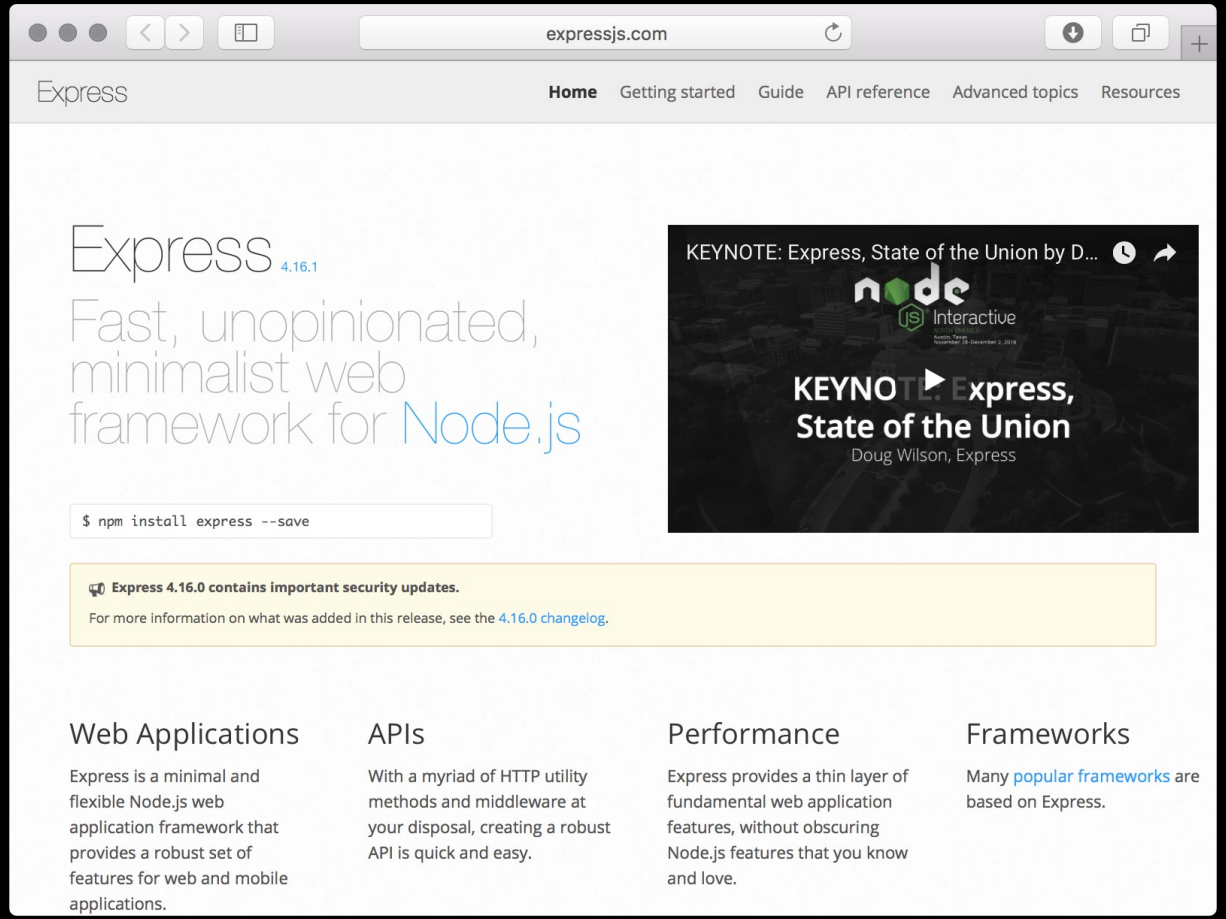
```
var http = require('http')

http.createServer(onrequest).listen(8000)

function onrequest(req, res) {
  res.statusCode = 200
  res.setHeader('Content-Type', 'text/html')
  res.send('Hello World!\n')
}
```

Handle each request by **sending “Hello World”**


bash
$ node index.js
Now we have a server!
localhost:8000
Hello World!

Note: this is a pretty simple server **that actually misses a lot of features:** routes, static files, mime types, streaming etc.

Express



?

expressjs.com

Express

?

- **Web Applications**: Express is a minimal and flexible Node web application framework that provides a robust set of features for web and mobile applications
- **APIs**: With a myriad of HTTP utility methods and middleware at your disposal, creating a robust API is quick and easy

expressjs.com

index.js

```
const express = require('express')

express()
  .get('/', onhome)
  .listen(8000)

function onhome(req, res) {
  res.send('<h1>Hello Client</h1>\n')
}
```

Express

index.js

```
const express = require('express')

express()
  .get('/', onhome)
  .listen(8000)

function onhome(req, res) {
  res.send('<h1>Hello Client</h1>')
}
```

Require **express** package

Express

index.js

```
const express = require('express')

express()
  .get('/', onhome)
  .listen(8000)

function onhome(req, res) {
  res.send('<h1>Hello Client</h1>')
}
```

Handle each request by **sending “Hello World”**

Express

express

middleware

Middleware functions are functions that have **access to the request and the response object.** [...] Middleware can **make changes** to the request and response objects.

Express

expressjs.com

index.js

```
const express = require('express')
const compression = require('compression')

express()
  .get('/', onhome)
  .listen(8000)
  .use(compression)

function onhome(req, res) {
  res.send('<h1>Hello Client</h1>')
}
```

For example **compression** is middleware

Express

Routes & Static

Routes

GET product/catbed

GET profile/ivo

GET about-us

GET hatseflats

product/****

1. Get info for product
2. Render product view

Product name

Price

user/****

1. Get info for user
2. Render user view

Username

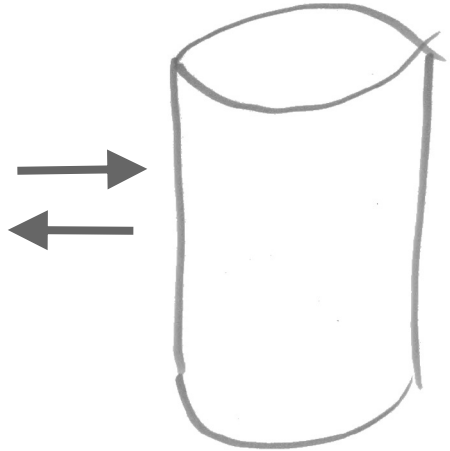
Email
Age
Address

about-us

Serve static
HTML page

everything
else

Error 404



Client

Server
(Node.js & Express)

Database

express

routing

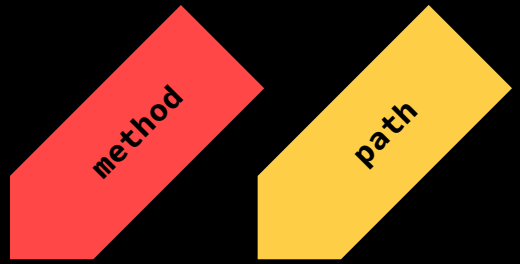
Routing refers to determining **how an application responds to a client request to a particular endpoint**, which is a URI (or path) and a specific HTTP request method (GET, POST).

Express

expressjs.com

express

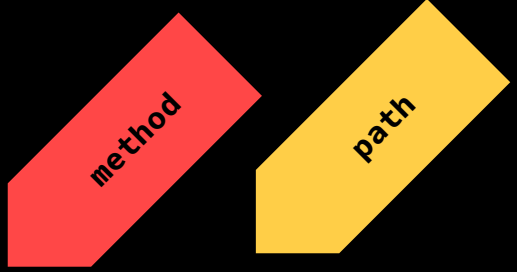
methods




```
app.get('/', callback)
```

Express

express



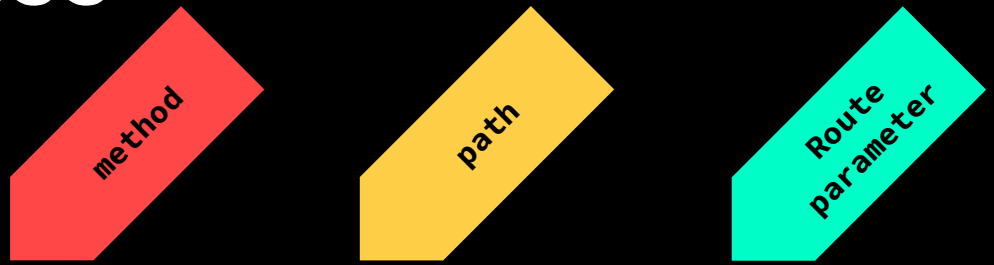
methods

```
app.get('/', callback)
```

```
examples from imdb.com:
app.get('/', callback)
app.get('/conditions', callback)
app.get('/chart/top', callback)
app.get('/chart/boxoffice', callback)
app.get('/title/:movieID', callback)
app.get('/title/:movieID/reviews', callback)
app.get('/name/:celebID', callback)
```

express

methods




```
app.get('/title/:movieID', callback)
```

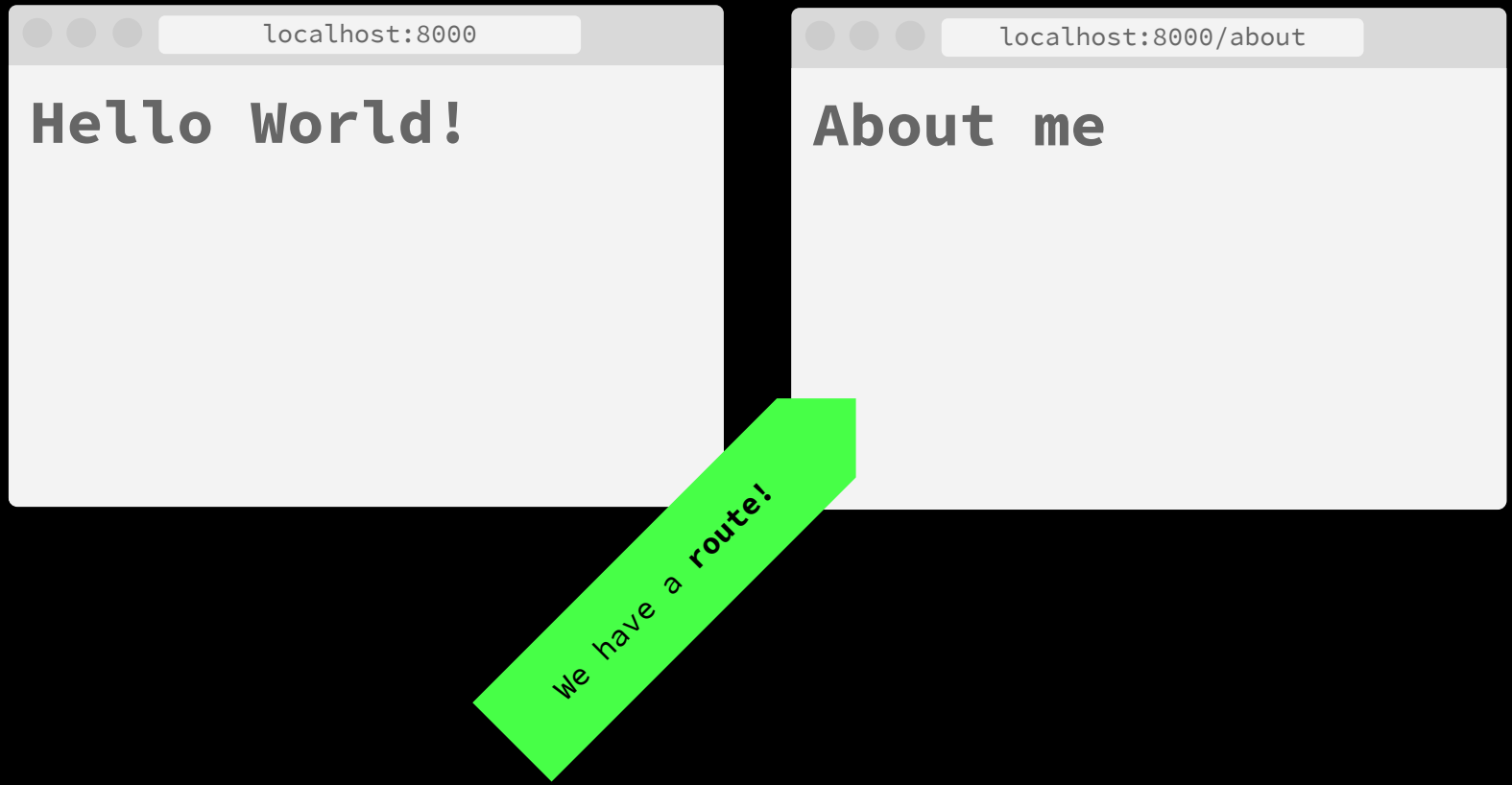
Access route parameter with

```
req.params.movieId
```

index.js

```
const express = require('express')

express()
  .get('/', onhome)
  .get('/about', onabout)

  .listen(8000)

function onhome(req, res) {
  res.send('<h1>Hello World!</h1>')
}

function onabout(req, res) {
  res.send('<h1>About me</h1>')
}
```

Express


localhost:8000
Hello World!
localhost:8000/about
About me
We have a route!

express

static

Static files are files that are **not dynamically generated.** For example; .css, images, fonts. Express provides static middleware to look up files relative to the static directory.

Express

expressjs.com

express

folders

```
// Files
plain-server/
├─ index.js
└─ static/
   ├─ css
   │     └─ style.css
   ├─ images
   │     └─ kitten.jpg
```

express

folders

```
// Files
plain-server/
├─ index.js
└─ static/
   ├─ css
   │     └─ style.css
   ├─ images
   │     └─ kitten.jpg
```

Note: everything in the **static folder will be public!**

index.js

```
const express = require('express')

express()
  .use('/static',express.static('static'))

  .get('/', onhome)
  .get('/about', onabout)

  .listen(8000)

function onhome(req, res) {
  res.send('<h1>Hello World!</h1>')
}

function onabout(req, res) {
  res.send('<h1>About me</h1>')
}
```

Use **static** middleware

Express

localhost:8000

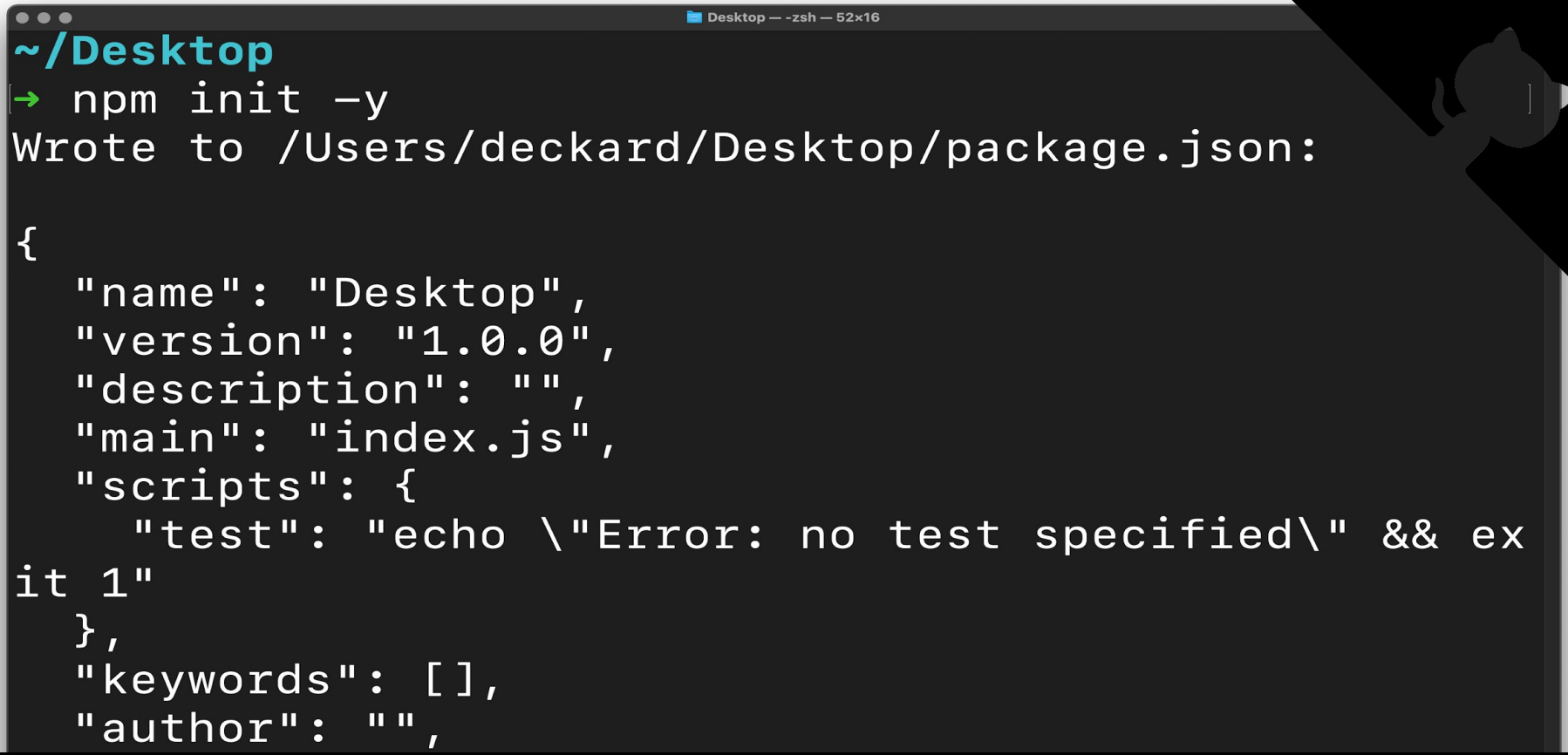
Hello World!

404

Not Found

CSS and Kittens!

Break!



Live demo express

Serve

> In this assignment you'll build a static file server with a little help from Express.

Synopsis

- **Time**: 4:00h
- **Goals**: subgoal 3, subgoal 4
- **Due**: before week 3

Description

Create a server that handles routes and serves static files in Node.js. Use the `express` web framework. Make sure it does (atleast) the following three things:

1. **Basic routing:** Have a couple of different `routes` (e.g. `/about` `/login`) that are useful for your matching-application.
2. **Error handling:** Respond with a `404 Not Found` if you go to a route that doesn't exist.
3. **Serve `static files`** : such CSS but also media files such as images, video's or audio files.

work on serve

Break!

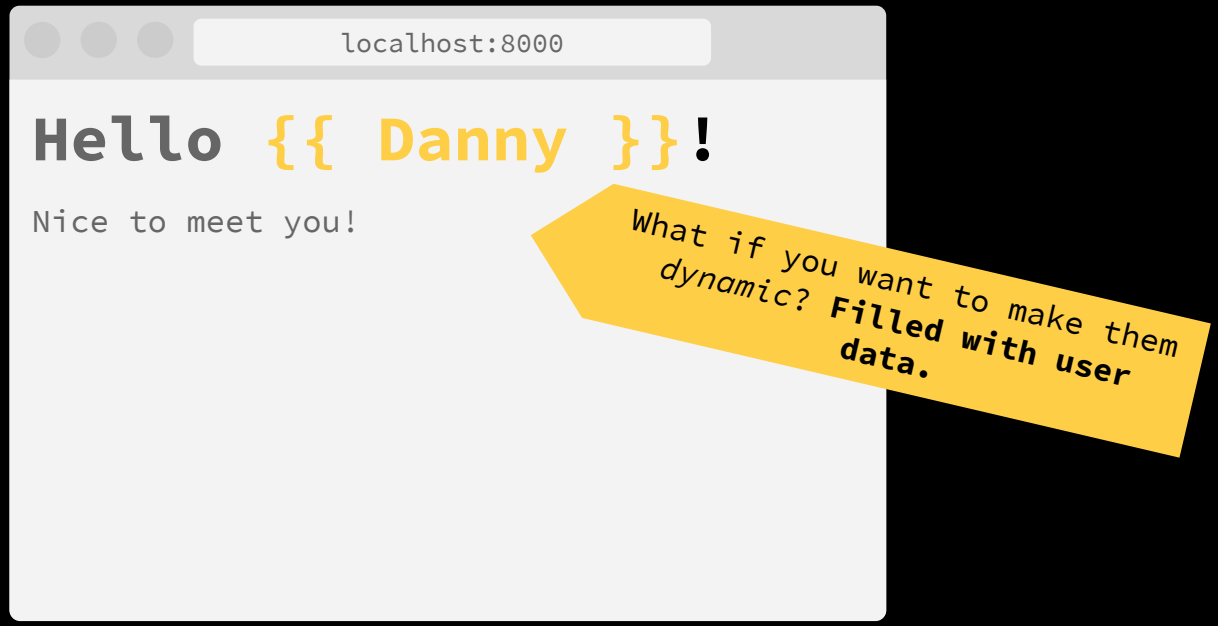
Templating

templating

static

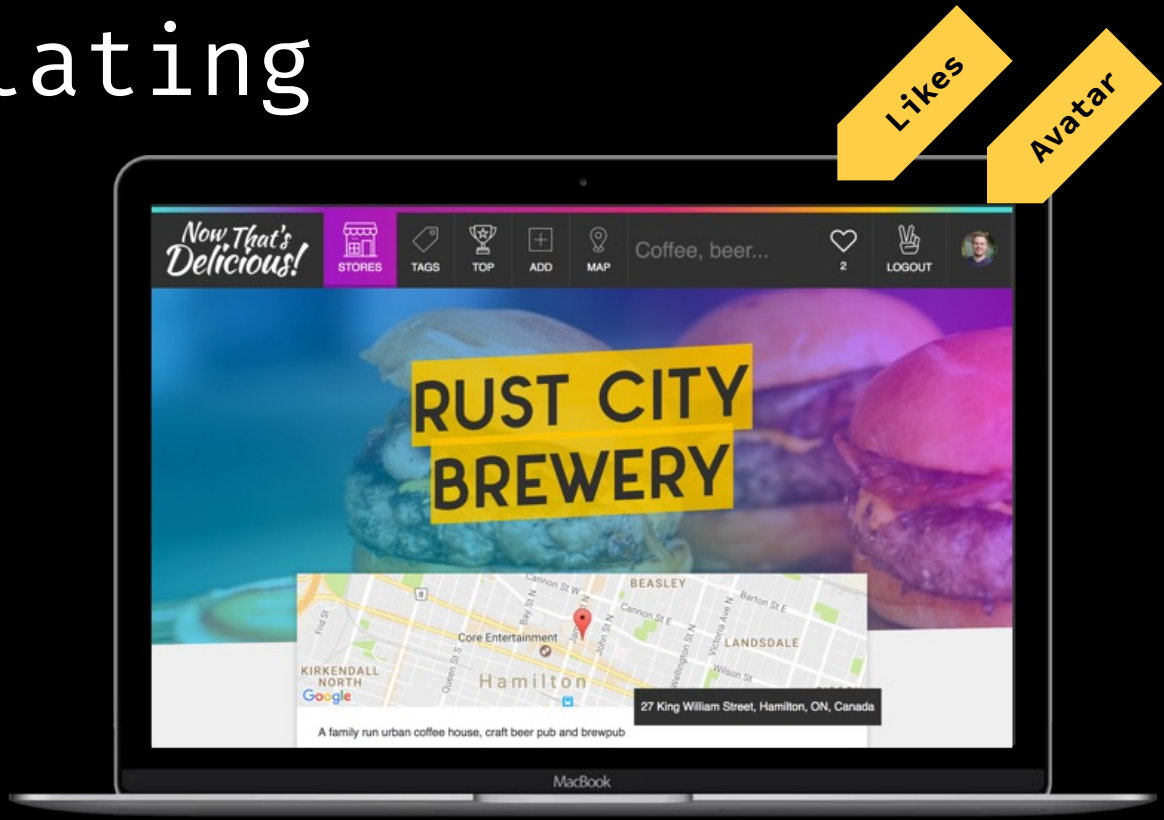
templating

dynamic



templating

dynamic



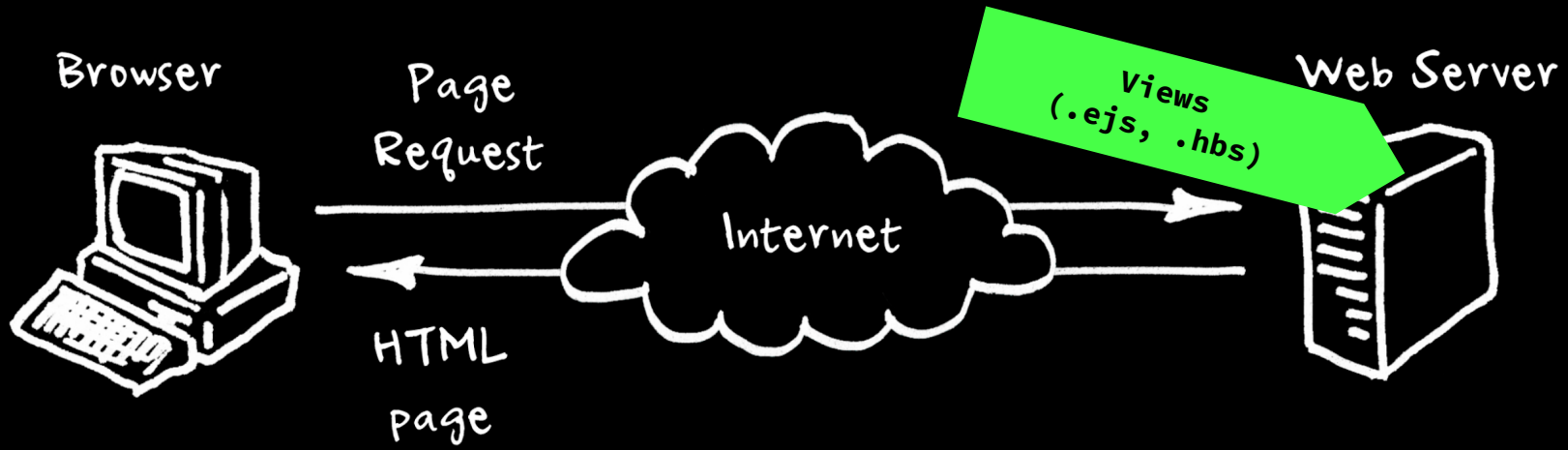
templating

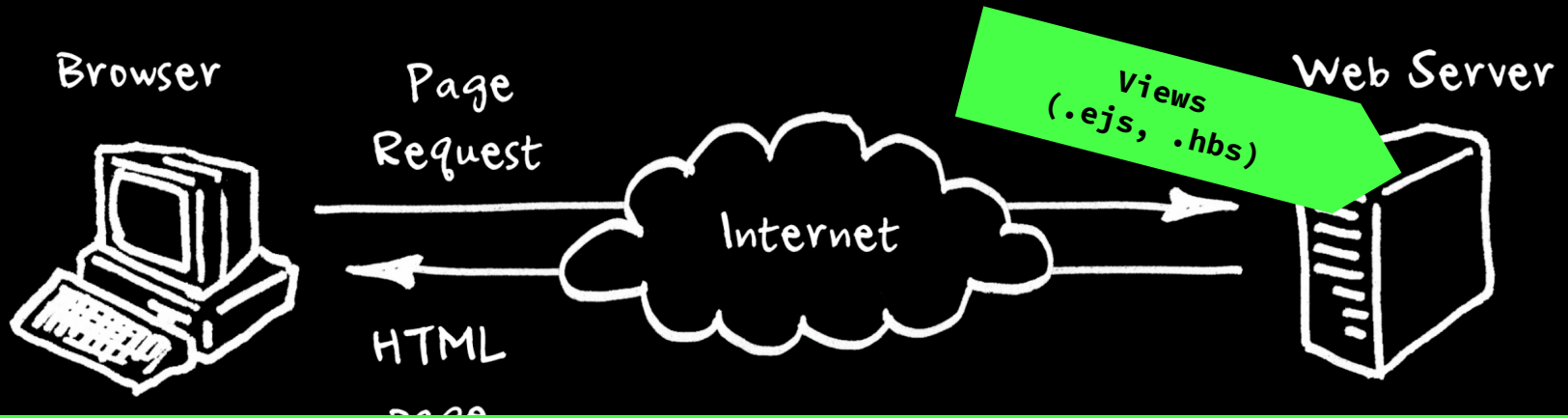
?

A template engine enables you to use static template files in your application. […] the template engine replaces variables in a **template file with actual values, and transforms the template into an HTML file sent to the client.**

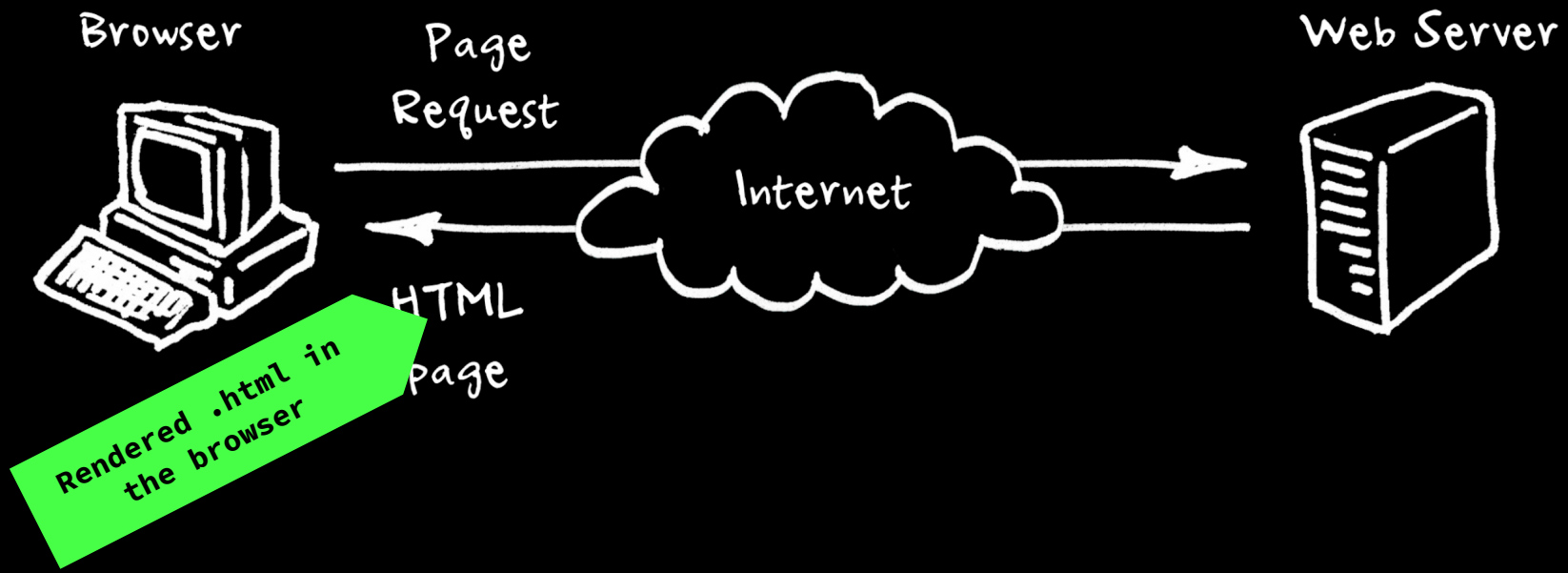
Express

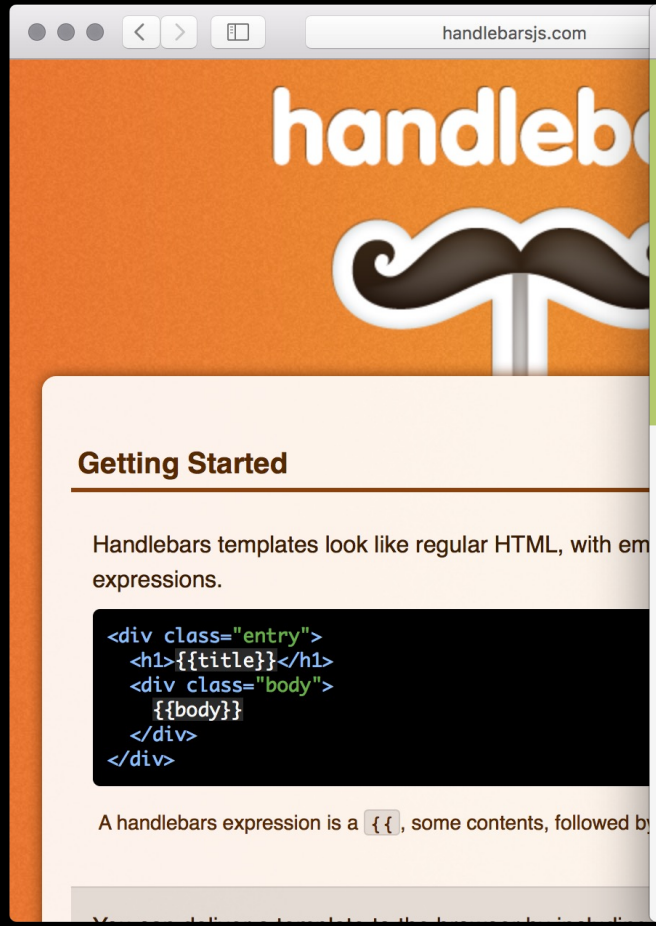
expressjs.com

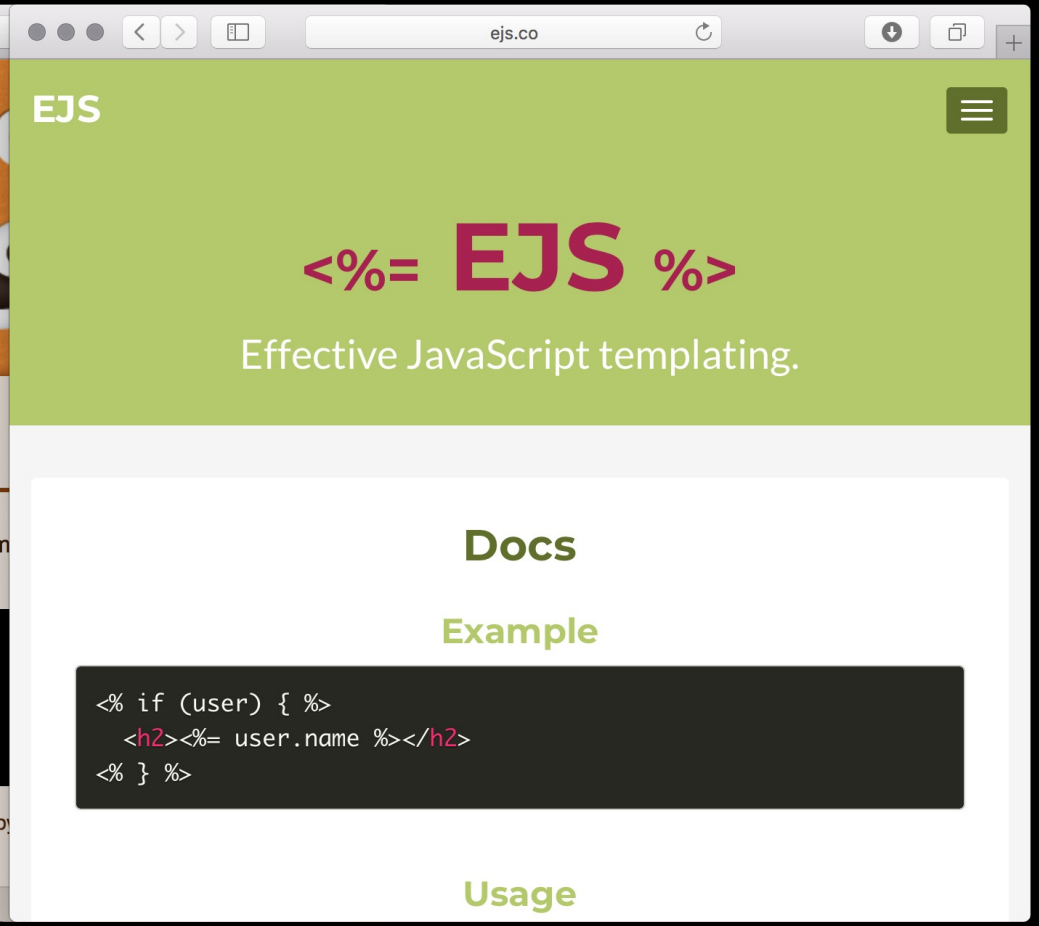

Browser
Page
Request
Internet
Views
(.ejs, .hbs)
Web Server
HTML
page



Note: instead of storing .html files you store ‘views’ (templating files)


Browser
Page
Request
Internet
Web Server
HTML
Page
Rendered .html in
the browser





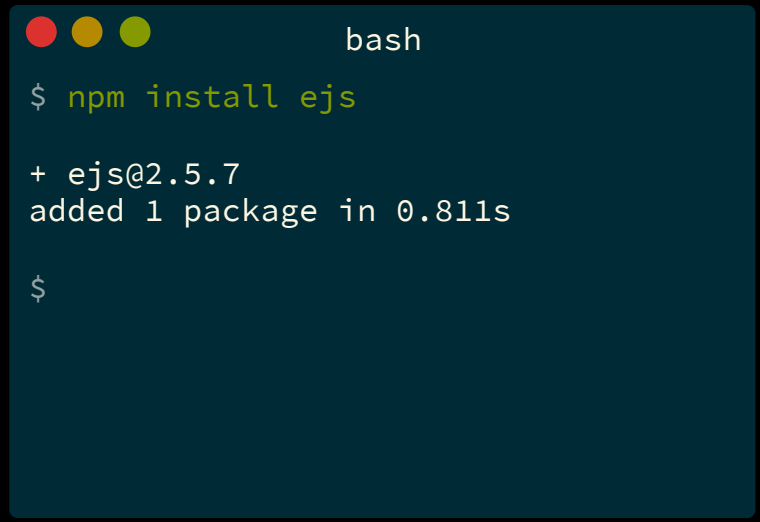
handlebarsjs.com

ejs.co

templating

views

```
// Files
express-server/
├─ node_modules/
├─ static/
│  └─ index.css
├─ view/
│  ├─ detail.ejs
│  ├─ list.ejs
│  └─ not-found.ejs
├─ index.js
└─ package.json
```



Express

templating

view/not-found.ejs

```
<!doctype html>
<link
  rel=stylesheet
  href=/index.css
>
<title>Not found - My movie
website</title>
<h1>Not found</h1>
<p>Uh oh! We couldn’t find this
page!</p>
```


```
<!doctype h
<link
  rel=s          t
  href=          .css
>
<title><%= data.title %> - My
movie website</title>
<h1><%= data.title %></h1>
<p><%= data.description %></p>
<p><a href="/">Back to
list</a></p>
```

Express

templating

partials

```
// Files
express-server/
├─ node_modules/
├─ static/
│  └─ index.css
├─ view/
│  ├─ detail.ejs
│  ├─ head.ejs
│  ├─ list.ejs
│  └─ not-found.ejs
├─ index.js
└─ package.json
```

Express

templating

partials

view/head.ejs

```
<!doctype html>
<link
  rel=stylesheet
  href=/index.css
>
```

view/not-found.ejs

```
<% include head.ejs %>
<title>Not found - My movie
website</title>
<h1>Not found</h1>
<p>Uh oh! We couldn’t find this
page!</p>
```

Express

index.js

```
…

express()
  .use(express.static('static'))
  .set('view engine', 'ejs')
  .set('views', 'view')
  …

function movies(req, res) {
  res.render('list.ejs', {data: data})
}

function movie(req, res, next) {
  …
  res.render('detail.ejs', {data: movie})
}

function notFound(req, res) {
  res.status(404).render('not-found.ejs')
}
```

Express

index.js

```
…

express()
  .use(express.static(‘static'))
  .set('view engine', 'ejs')
  .set('views', 'view')
  …

function movies(req, res) {
  res.render('list.ejs', {data: data})
}

function movie(req, res, next) {
  …
  res.render('detail.ejs', {data: movie})
```

Note: Views are **rendered** (combined with data) on the server. The resulting HTML is sent to the client.

index.js

```
var express = require('express')

var moviesList = [
  {
    id: 'evil-dead',
    title: 'Evil Dead',
    description: 'Five friends head to a remote …'
  },
  {
    id: 'the-shawshank-redemption',
    title: 'The Shawshank Redemption',
    description: 'Andy Dufresne is a young and  …'
  }
]

express()
  .get('/', movies)
  .listen(8000)

function movies(req, res) {
  res.render('list.ejs', {data: moviesList})
}
```

Express

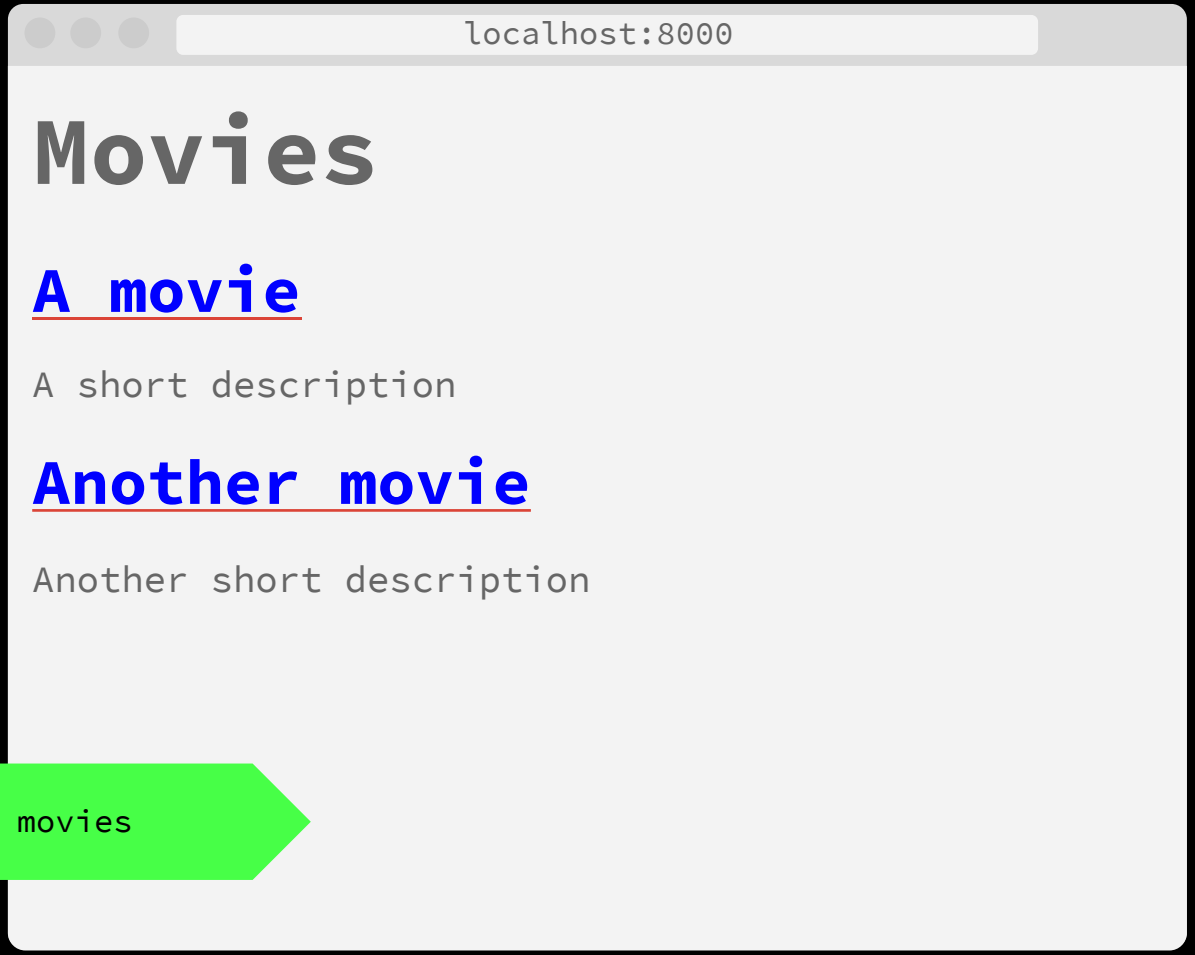
view/list.ejs

```
<!doctype html>
<link rel=stylesheet href=/index.css>
<title>Movies - My movie website</title>
<h1>Movies</h1>
<% for (var index = 0; index < data.length; index++) { %>
  <h2>
    <a href="/<%= data[index].id %>">
      <%= data[index].title %>
    </a>
  </h2>
  <p><%= data[index].desciption %></p>
<% } %>
```

<% is JavaScript without output

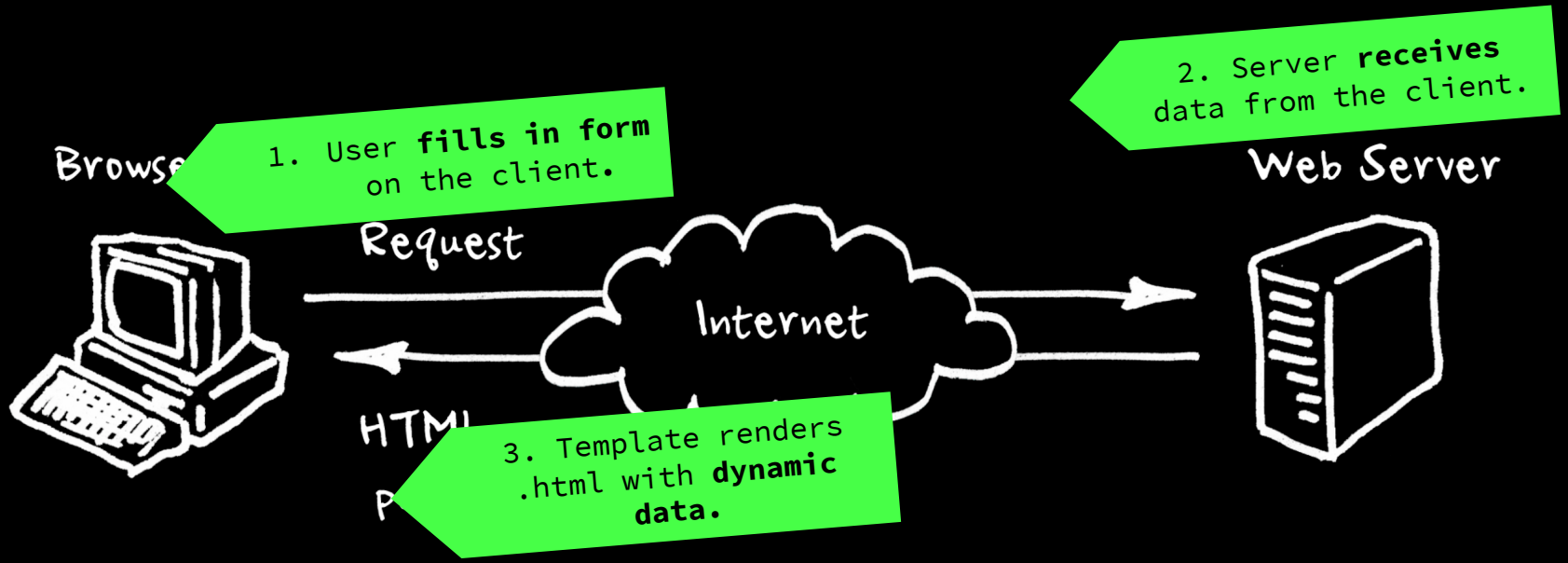
<% stops JavaScript

Express

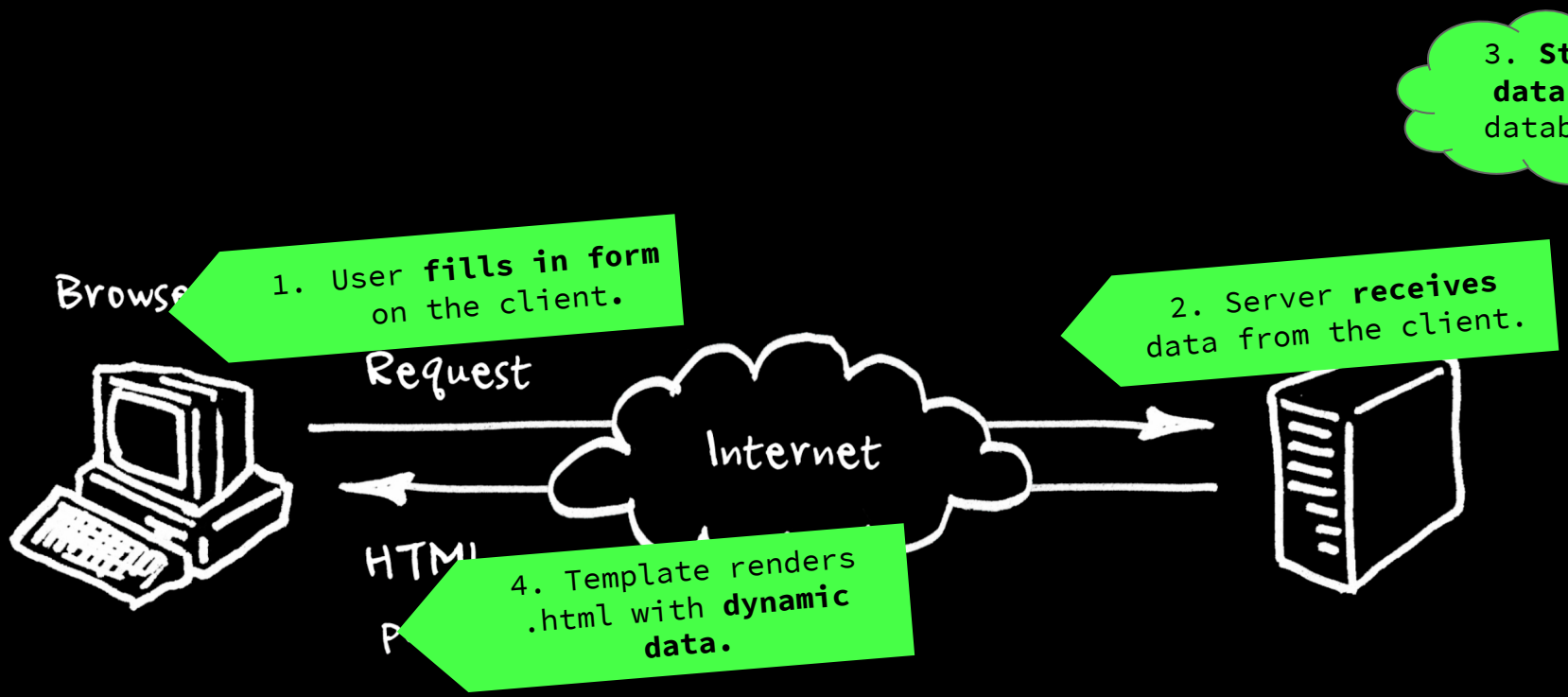


List with movies

Express



Next up: get that data from user input.
So, for example, **a form**!



Next up: And then store that data into **a database**!

Templating

templating

> Learn how to use a templating engine to dynamically render data and create components for your matching application.

Synopsis

- **Time**: 6:00h
- **Goals**: subgoal 4
- **Due**: before week 3

Description

We are slowly going to build the interface and components for your matching application. You already have a server up an running, now it's time to actually send dynamic HTML to the client using a templating engine.

1. Research different templating engines and read there documentation such as `pug`, `ejs` or `handlebars`. Document your research in your wiki. Pick one and install it in your project.

2. Then, create views and try to render a page using the templating engine. Start with (simple) HTML pages and make sure you get

work on templating

exit;

see you in lab-3!