

# Intro to Express.js and View Engines

Router, Static Files, Middleware, Handlebars



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**#js-back-end**

## 1. Express

- Introduction
- Router
- Middleware
- Static Files

## 2. View Engines

- Templating Concepts
- Handlebars





# Introduction to Express.js

# Introduction to Express.js

```
npm install express
```

```
const express = require('express')
const app = express();
const port = 3000;
app.get('/', (req, res) => {
  res.status(200);
  res.send('Welcome to Express.js!');
})
app.listen(port, () => console.log(`Express running
on port: ${port}...`));
```

Create a new **instance** of  
the **application**



# Router in Express.js

# Router

- Routing has the following syntax

```
app.METHOD(PATH, HANDLER)
```

- Where
  - **app** is an **instance** of express
  - **METHOD** is an HTTP **request** method, in **lowercase**
  - **PATH** is a path on the **server**
  - **HANDLER** is the function **executed** when the route is **matched**



# Route Methods

*// GET method route*

```
app.get('/', (req, res) => {  
  res.send('GET request to the homepage')  
})
```

*// POST method route*

```
app.post('/', (req, res) => {  
  res.send('POST request to the homepage')  
})
```

*// PUT method route*

```
app.put('/', (req, res) => {  
  res.send('PUT request to the homepage')  
})
```





# Route Methods

*// ALL methods route*

```
app.all('/about', (req, res, next) => {  
  console.log('Middleware execution..')  
  next()  
}, (req, res) => {  
  res.send('Show about page.')  
})
```

The next handler to be called

Shows the about page after  
middleware execution



# Router Paths

- Paths can **contain** special characters:

```
app.get('*', (req, res) => {  
  res.send('Matches everything')  
})
```

Based on **string** patterns

```
app.get('/ab*cd', (req, res) => {  
  res.send('abcd, abANYTHINGcd')  
})
```


Based on **regular** expressions

```
app.get(/.*fly$/, (req, res) => {  
  res.send('butterfly, dragonfly')  
})
```



# Extracting Parameters

- Paths can have **parameters**



```
app.get('/users/:userId', (req, res) => {  
  const paramsObj = req.params  
  res.send(paramsObj) })
```

- You can also **validate** parameters with **regular expressions** (it is not recommended)

```
app.get('/users/:userId(\\d+)', (req, res) => {  
  const paramsObj = req.params  
  res.send(paramsObj) })
```

- You can create **chainable** route handlers using '**app.route()**'

```
app.route('/home')
```

Better for **ordering** routes

```
.get((req, res) => {  
  res.send('GET home page') })  
.post((req, res) => {  
  res.send('POST home page') })  
.all((req, res) => {  
  res.send('Everything else')  
})
```

Always place '**all**' as a **final** method

# Router Responses

- Responses

- `res.download` - prompt a file to be downloaded

```
app.get('/pdf', (req, res) => {  
  res.download('FULL PATH TO PDF')  
})
```

- `res.end` - end the response process
  - `res.json` - send a JSON response



# Router Responses

- `res.redirect` - redirect a request (to **another** page)

```
app.get('/about/old', (req, res) => {  
  res.redirect('/about') })
```

- `res.sendFile` - send a **file** as an **octet**-stream


```
app.get('/file/:fileName', (req, res) => {  
  const fileName = req.params.fileName  
  res.sendFile("PATH TO FILE" + fileName) })
```

- `res.render` - render a **view template**



# Modular Routers

- You can use **express.Router** for modular route handlers
  - **Mounted** on a route (e.g. '/about')
  - Can use middleware, specific **only** to that router




```
const express = require('express')
const router = express.Router()
router.use(/* add middleware */)
router.get(/* define route handlers */)
app.use('/about', router)
```



# Middleware



# Middleware

- 
- **Function** that has **access** to
    - The **request** and **response** object
    - The **next** middleware in the application's **request-response cycle**
  - Different **kinds** of middleware exist
    - Application, route, error

```
const app = express()  
app.use((req, res, next) => {  
  console.log('Time:', Date.now())  
  next() })
```

Next **handler** to be called

# Custom Middleware

- Middleware can be for **specific** path

```
app.use('/user/:userId', (req, res, next) => {  
  const userId = req.params.userId  
  // TODO: Check if user exists in db/session  
  let userExists = true  
  if (!userExists) { res.redirect('/login') }  
  else { next() }  
})  
app.get('/user/:userId', (req, res) => {  
  res.send('User home page!')  
})
```



# Custom Middleware

- Can be on Application-level:

```
app.use(function (req, res, next) {  
  console.log('Time:', Date.now()) next()  
});
```

- Can be used for error-handling

```
app.use(function (err, req, res, next) {  
  console.error(err.stack)  
  res.status(500).send('Something broke!')  
});
```



```
app.set('view engine', 'pug');  
app.set('views', __dirname + '/views');  
app.use(cookieParser());  
app.use(session({secret: 'magic unicorns'}));  
app.use(passport.initialize());  
app.use(passport.session());  
app.use(express.static(config.rootPath + '/public'));
```



**Static Files**

- Serving static files

```
app.use(express.static('public'))  
app.use('/static', express.static('public'))  
app.use('/static', express.static(__dirname + '/public'))
```

- And all **files** from the directory will be **public**

```
http://localhost:3000/images/kitten.jpg  
http://localhost:3000/css/style.css  
http://localhost:3000/js/app.js  
http://localhost:3000/images/bg.png  
http://localhost:3000/hello.html
```



# Templating Concepts

# Templating

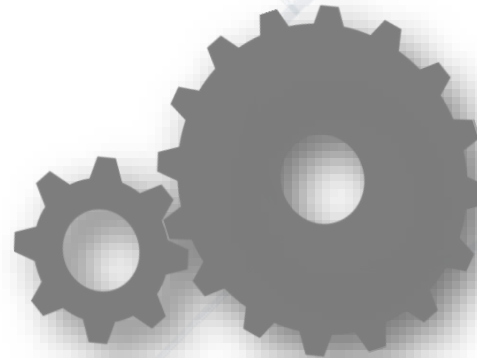
- Allows similar content to be **replicated** in a web page, **without repeating** the corresponding markup everywhere

## HTML

```
<div>  
<span>  
<button>
```

## Dynamic

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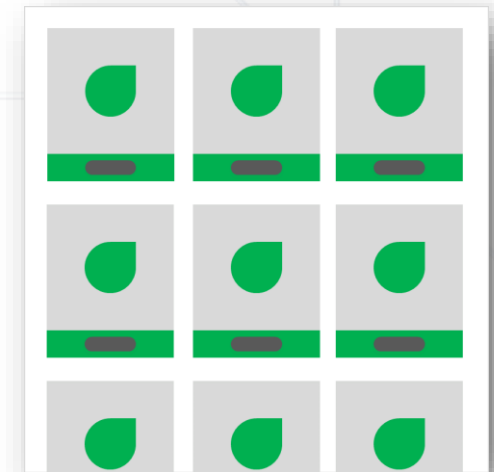
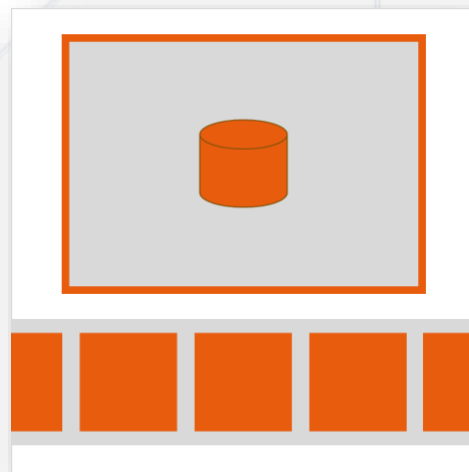
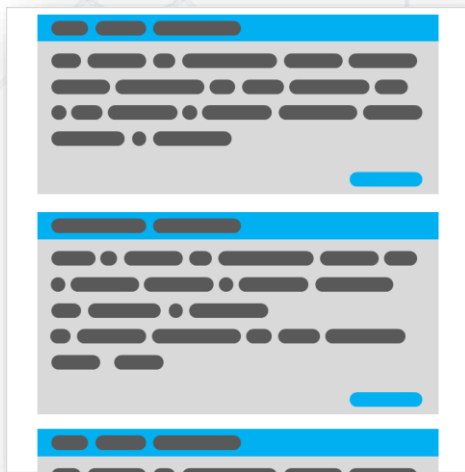
# Templating Concepts

- The **static parts** of a webpage are stored as **templates**
- The **dynamic content** is kept separately (e.g. in a **database**)
- A **view engine** combines the two
- Benefits
  - **Productivity** - avoid writing the same markup over and over
  - **Easier upkeep** - only change the code in one place
  - **Composability** - a single element can be used on multiple pages



# Examples

- Display articles in a blog
- Display a gallery of photos
- Visualize user profiles
- Show items in a catalog



- Server view engines **return** ready-to-use **HTML** to the **client** (the browser)
  - They parse the **data** to **HTML** on the **server**
  - Web applications, created with **server** view engines are **not** real **SPA** apps (In **most** cases)
- Famous View Engines
  - Pug, Mustache, Handlebars, EJS, Vash

handlebars



# Templating with Handlebars

# Handlebars

- Based on **Mustache** specification
- Expressions are **initialized** with '{{' and finish with '}}



```
<div class="entry">
  <h1>{{title}}</h1>
  <div class="body">
    {{body}}
  </div>
</div>
```

```
<div class="entry">
  <h1>My New Post</h1>
  <div class="body">
    This is my first post!
  </div>
</div>
```

# Integration in Express

```
npm install express-handlebars
```

```
const app = require('express')()  
const exphbs = require('express-handlebars')  
const handlebars = exphbs.create({ extname: '.hbs' });  
app.engine('.hbs', handlebars.engine)  
app.set('view engine', '.hbs')
```

```
app.get('/', function (req, res) {  
  res.render('home');  
})
```

Call the template

# Handlebars directory structure

- Must have a **views** folder containing all the Handlebars templates:



- The **layouts** folder inside the views folder will contain the layouts or the template wrappers
- The **main.hbs** file is the main layout
- **Note:** The default name of the folders can be changed with an appropriate setting

- A template can be **repeated** for every entry in an **array**

```
const context = {  
  contacts: [  
    { name: 'Maria Petrova', email: 'mar4eto@abv.bg'},  
    { name: 'Jordan Kirov', email: 'jordk@gmail.com'} ]};
```

```
<ul id="contacts">  
  {{#each contacts}}  
    <li>{{name}}: {{email}}</li>  
  {{/each}}  
</ul>
```

The expression  
inside  
the loop uses each  
**entry as context**



# Conditional Statements

```
{{#if sunny}}  
  The sky is clear  
{{else}}  
  The sky is overcast  
{{/if}}
```

Variable to check  
for **truthiness**

Will be shown if  
the array is **empty**

```
<ul id="contacts">  
  {{#each contacts}}  
    <li>{{name}}: {{email}}</li>  
  {{else}}  
    <i>(empty)</i>  
  {{/each}}  
</ul>
```



# Partials

- **Templates** that can be **inserted into** other templates

```
<div id="contacts">
  {{#each contacts}}
    {{> contact}}
  {{else}}
    <i>(empty)<i>
  {{/each}}
</div>
```



- By default, any strings that are evaluated will be **HTML-escaped**
- To prevent this, use the "**triple-stash**"

```
title: "All about <p> Tags"  
body: "<p>This is a post about &lt;p> tags</p>"
```

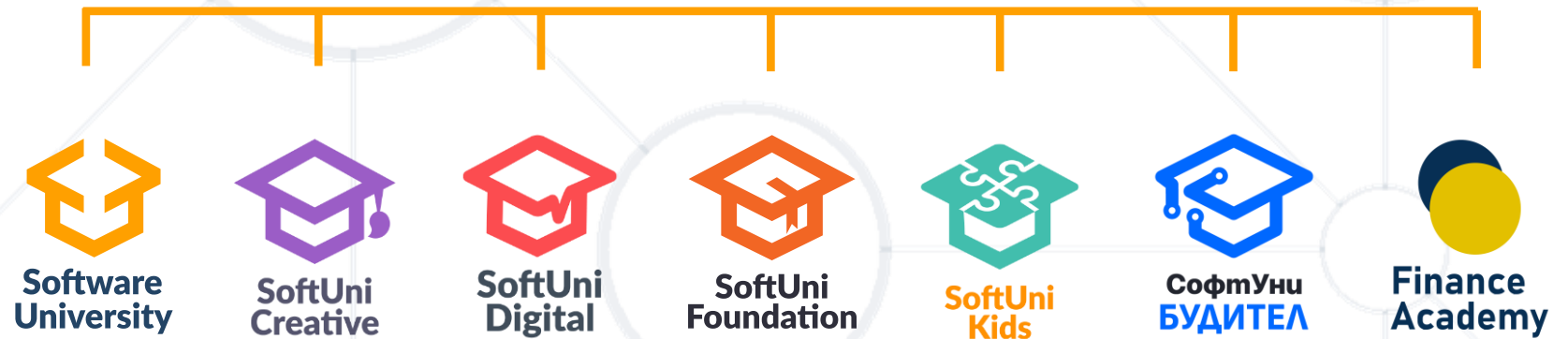
```
<h1>{{title}}</h1>  
  <div class="body">  
    {{{body}}}  
  </div>
```

```
<h1>All About &lt;p> Tags</h1>  
  <div class="body">  
    <p>This is a post about &lt;p> tags</p>  
  </div>
```

- Express.js is a **fast** web **framework** for Node.js
- **Middlewares** can **manipulate** requests and responses
- Templates **speed up** and **simplify** development
- View Engines **render templates**
- **Handlebars** offers effective templates and simple helper functions



# Questions?



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