Intro to Express.js

CS 390 – Web Application Development

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Outline

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- Express is explicitly *unopiniontated*. This is important, since it allows us to self-select an implementation strategy for our application.

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- Express works fundamentally as an abstraction layer over the traditional API implementation. It's a big reason why it's so easy to work with.
- Middleware allows us fine-grained control over the routing process within the API, enabling us to extend the Express functionality depending on the use-case.

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An endpoint is the network location of a resource or application. During development, the API endpoint we will use is `http://localhost:1337/`.

HTTP Request Methods

HTTP Methods define the type of action requested by a user at a given endpoint. The following HTTP methods are especially relevant:

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Method	**Use**
GET	Retrieve information
POST	Insert new information
PUT	Update information
DELETE	Delete a specified resource

HTTP Response Codes

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Some useful status codes:

Status Code	**Use**
200	OK

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500	Internal Server Error

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503	Service Unavailable

Outline

Basic Routing

Express relies on routing to determine how the API responds to a client request.

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Syntax: `app.<method>(<path>, <middleware>);`
Example: `app.get('/', (req, res) => { res.send('Hello World!'); });`
The above example responds to a `GET` request sent to the root endpoint.

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Example: `app.get(‘/’, (req, res) => { res.send(‘Hello World!’); });`
The above example responds to a `GET` request sent to the root endpoint.

We can also use `all` in place of a method, to respond to every method with a single function.

MVP from Monday (Express.js Version)

If you can view this screen, I am making a mistake.

Static Files

The syntax for serving a static file is straightforward:

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// ... some code
app.use('/location', express.static('path/to/dir'))
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The directory is crucial to **containerize** file serving!

This can also be used to serve HTML files, by making a `GET` request to the endpoint followed by the path.

Alternatively, you can send a file without exposing a directory:
Syntax: `res.sendFile('path/to/file.html');`

Route Chaining

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One solution is route-chaining; multiple methods by specifying `route` outside the methods.
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Syntax: `app.route('/path').get(f).post(f).put(f).delete(f);`

Instead of:

```
app.get('/path', f);
app.post('/path', f);
app.put('/path', f);
app.delete('/path', f);
```

Where `f` is a function handling the operation for the route.

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We can export it the same way as a normal node module, by adding `exports.<route>` and importing the module path with `require`.

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- Remove `bin/`.
- Prune `app.js`.
- Add `nodemon` as a dev dependency.
- Update `package.json` to reflect the above changes.

Let’s Build a Static File Server!

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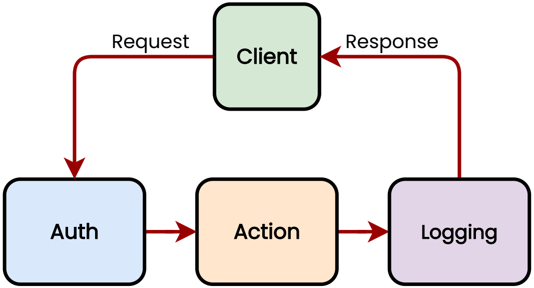
Idea: Everything is Middleware!

Q: What happens when we run an Express function? How does Express interpret it?
A: It runs a series of functions sequentially - like traversing a linked list. It propagates forward when `next();` is called. Once all function calls are completed, the response is returned.



Middleware – Syntax

Let's break down some sample code:

```
// ... some code
app.get('/', f, (req, res) => {
                    res.send('Hello from the Express
                        API!!');
            })

function f(req, res, next) {
          console.log('f');
          next();
}
// ... some code
```

Middleware – Passing Values Between Functions

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Passing data is incredibly important; it's what allows functions to communicate. Here's how we do it:

```
// ... some code
function f(req, res, next) {
        console.log('f');
        req.f = true;
        next();
}

app.get('/', f, (req, res) => {
                  console.log(`${req.f}`);
                  res.send('Hello from the Express
                      API!!');
           })
// ... some code
```

Middleware – Some Nuance

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Secondly:

- Middleware is called in order of declaration.
- Don't accidentally call authentication after the action!

Let's Implement Server Logging!

If you can view this screen, I am making a mistake (again).

Outline

Reminder – Project Proposal

Due on 10th October, 2023 @ 11:59pm.

Project Template in Brightspace under CONTENT > Project > Project Proposal Template.

Teams are ideally between 2-4 contributors. If you'd want to deviate from this, please email us or post on piazza!

Thank you!

Have an awesome rest of your day!

Slides:

`https://cs.purdue.edu/homes/jsetpal/slides/intro-express.pdf`

If anything's incorrect or unclear, please ping `jsetpal@purdue.edu`
I'll patch it ASAP.