

Module 6 Activity 1: Advanced Middleware and Routing in Express.js

Brandon Trinkle

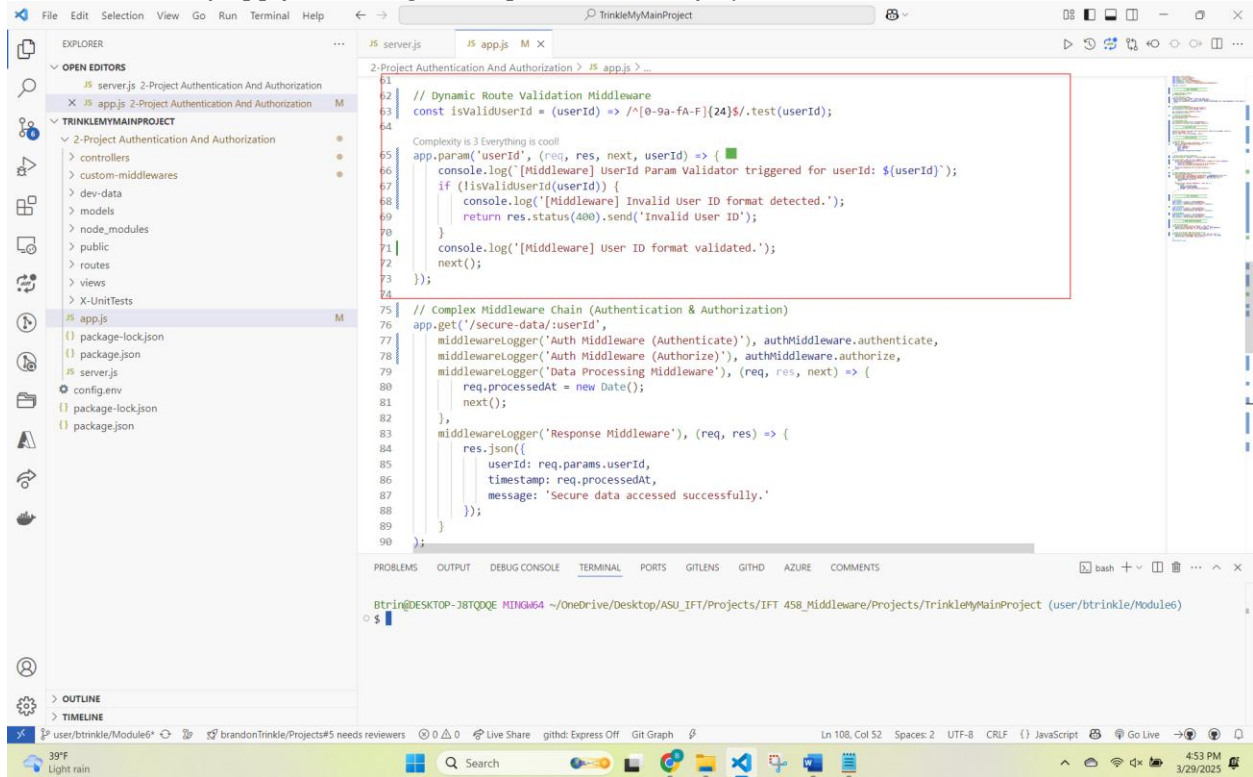
IFT 458: Middleware Programming

Professor Dinesh Sthapit

March 29, 2025

Module 6 Activity 2: Advanced Middleware and Routing in Express.js

Screenshot 1: Of app.js showing the implementation of dynamic routes.



Screenshot 2: Of the middleware code for request validation in app.js.

```

1 // Project Authentication And Authorization > JS app.js > ...
2 // Dynamic Route Validation Middleware
3 const isValidUserId = (userId) => /^[0-9a-fa-f]{24}$/.test(userId);
4
5 // Complexity is 3 Everything is cool!
6 app.param('userId', (req, res, next, userId) => {
7   console.log('[Middleware] UserId Param Validator triggered for userId: ${userId}');
8   if (!isValidUserId(userId)) {
9     console.log('[Middleware] Invalid User ID format detected.');
```

```

75 // Complex Middleware Chain (Authentication & Authorization)
76 app.get('/secure-data/:userId',
77   middlewareLogger('Auth Middleware (Authenticate)'), authMiddleware.authenticate,
78   middlewareLogger('Auth Middleware (Authorize)'), authMiddleware.authorize,
79   middlewareLogger('Data Processing Middleware'), (req, res, next) => {
80     req.processedAt = new Date();
81     next();
82   },
83   middlewareLogger('Response Middleware'), (req, res) => {
84     res.json({
85       userId: req.params.userId,
86       timestamp: req.processedAt,
87       message: 'Secure data accessed successfully.'
88     });
89   });
90
91

```

```

Btrink@DESKTOP-38TQQQE MINGW64 ~/OneDrive/Desktop/ASU_IFT/Projects/IFT_458_Middleware/Projects/TrinkleMyMainProject (user/btrinkle/Modules)
$

```

Screenshot 3: Showing a route in app.js with a complex middleware chain.

```

65 app.param('userId', (req, res, next, userId) => {
66   console.log('[Middleware] UserId Param Validator triggered for userId: ${userId}');
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68     console.log('[Middleware] Invalid User ID format detected.');
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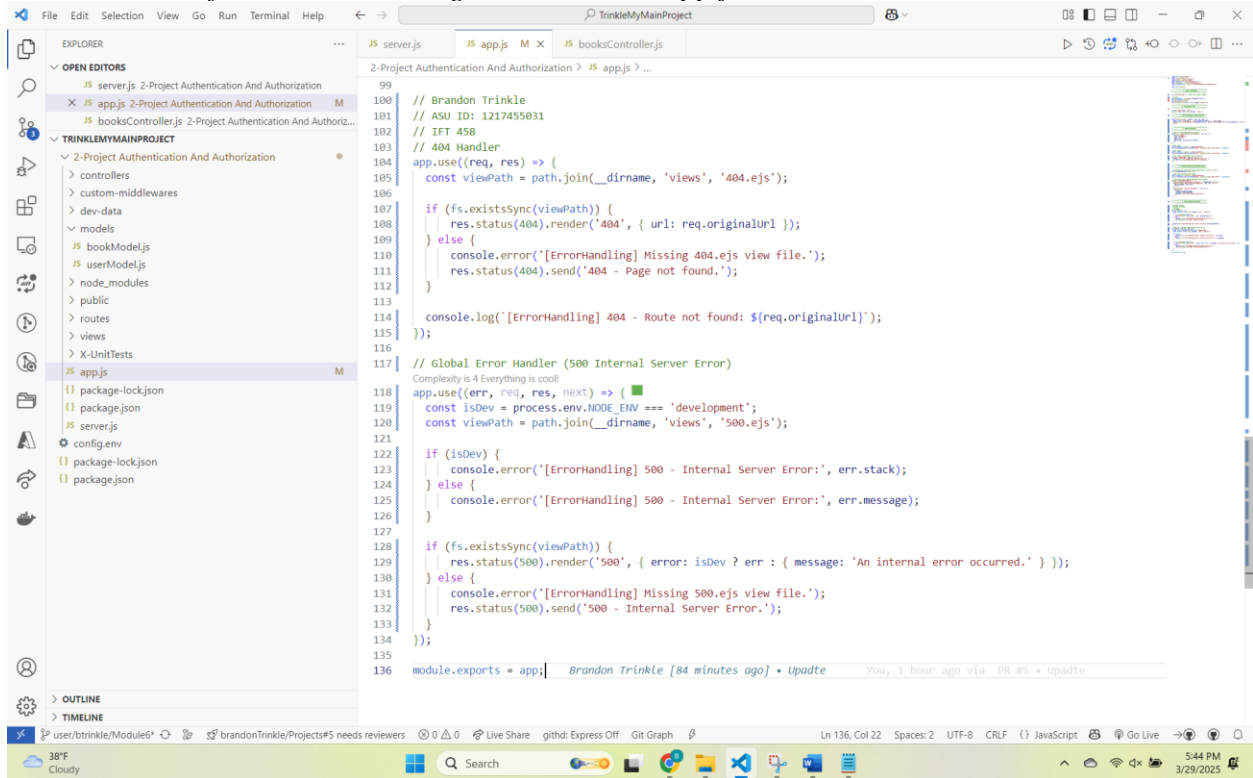
```

```

Btrink@DESKTOP-38TQQQE MINGW64 ~/OneDrive/Desktop/ASU_IFT/Projects/IFT_458_Middleware/Projects/TrinkleMyMainProject (user/btrinkle/Modules)
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```

Screenshot 4: Of the error handling middleware in app.js.



Note: During testing it outputs a lot of nuisance logs – I did my best to limit the number of logs.

Screenshot 5: Showcasing test cases and responses for different error types.

- Running host on server (Custom Middleware)

```

File Edit Selection View Go Run Terminal Help
TrinkleMyMainProject

EXPLORER
2-Project Authentication And Authorization
  server.js
  app.js
  2-Project Authentication And Authorization
    controllers
    custom-middlewarees
    dev-data
    models
      bookModel.js
      userModel.js
    node_modules
    public
    routes
    views
    X-UnitTests
  app.js
  package-lock.json
  package.json
  server.js
  config.env
  package-lock.json
  package.json

OUTLINE
TIMELINE

2-Project Authentication And Authorization > JS server.js > ...
1 // server.js
2
3 // Set up global punycode so that upstream dependencies use the userland version
4 global.punycode = require('punycode'); 217 (gzipped: 170)
5
6 // Load environment variables early
7 const dotenv = require('dotenv'); 6.3k (gzipped: 2.8k)
8 dotenv.config({ path: './config.env' });
9
10 // Import mongoose and configure strictQuery to suppress the warning
11 const mongoose = require('mongoose'); 832.8k (gzipped: 223.7k)
12 mongoose.set('strictQuery', false);
13
14 // Import your Express app
15 const app = require('./app');
16
17 // Define your MongoDB connection string (or use one from your environment variables)
18 const DB = {
19   process.env.DATABASE ||
20   "mongodb+srv://btrinkle52:lVfPGisucpwqBkn@trinklecluster.obqkf.mongodb.net/?retryWrites=true&majority&appName=Trinkle"
21 };
22 console.log("Connecting to DB:", DB);

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS GITHD AZURE COMMENTS
(node:6088) [DEP0049] DeprecationWarning: The 'punycode' module is deprecated. Please use a userland alternative instead.
(Use 'node --trace-deprecation ...' to show where the warning was created)
DB connection successful!
App running on port 4000...
To test the IFT 458 REST App, visit: http://localhost:4000...
[Custom Middleware] bodyParser URL Encoded - Method: GET, URL: /, Time: 2025-03-29T21:04:51.309Z
[Custom Middleware] bodyParser JSON - Method: GET, URL: /, Time: 2025-03-29T21:04:51.310Z
[Custom Middleware] cookieParser - Method: GET, URL: /, Time: 2025-03-29T21:04:51.311Z
[Custom Middleware] static Files Middleware - Method: GET, URL: /, Time: 2025-03-29T21:04:51.311Z
[Custom Middleware] Home Route - Method: GET, URL: /, Time: 2025-03-29T21:04:51.314Z
GET / 304.15.137 ms - -

```

- Logging in (Auth Middleware)

```

File Edit Selection View Go Run Terminal Help
TrinkleMyMainProject

EXPLORER
2-Project Authentication And Authorization
  server.js
  app.js
  booksController.js
  2-Project Authentication And Authorization
    controllers
    custom-middlewarees
    dev-data
    models
      bookModel.js
      userModel.js
    node_modules
    public
    routes
    views
    X-UnitTests
  app.js
  package-lock.json
  package.json
  server.js
  config.env
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  package.json

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19   process.env.DATABASE ||
20   "mongodb+srv://btrinkle52:lVfPGisucpwqBkn@trinklecluster.obqkf.mongodb.net/?retryWrites=true&majority&appName=Trinkle"
21 };
22 console.log("Connecting to DB:", DB);

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS GITHD AZURE COMMENTS
DB connection successful!
App running on port 4000...
To test the IFT 458 REST App, visit: http://localhost:4000...
[Custom Middleware] Home Route - User: Guest - Method: GET, URL: /, Time: 2025-03-29T21:15:34.461Z
GET / 304.28.516 ms - -
[Custom Middleware] View Router - User: Guest - Method: GET, URL: /api/v1/views/loginUser, Time: 2025-03-29T21:15:38.333Z
GET /api/v1/views/loginUser 304.2.791 ms - -
[Custom Middleware] User Router - User: Guest - Method: POST, URL: /api/v1/users/login, Time: 2025-03-29T21:15:47.773Z
POST /api/v1/users/login 200.325.737 ms - 2691
[Custom Middleware] View Router - User: Guest - Method: GET, URL: /api/v1/views, Time: 2025-03-29T21:15:49.168Z
GET /api/v1/views 304.2.700 ms - -
[AuthMiddleware] User authenticated: btrinkle1@asu.edu
[Custom Middleware] Book Router - User: btrinkle1@asu.edu - Method: GET, URL: /api/v1/books, Time: 2025-03-29T21:16:03.390Z
[AuthMiddleware] User authenticated: btrinkle1@asu.edu
[AuthMiddleware] Authorizing user: btrinkle1@asu.edu, role: client
No books found, rendering book exchange form.
GET /api/v1/books 304.145.285 ms - -

```

- Error handling Middleware 404

```

22 console.log("Connecting to DB:", DB);
23
24 // Connect to the database, then start the server if successful
25 mongoose
26
27 .connect(DB, {
28   useNewUrlParser: true,
29   useUnifiedTopology: true
30 })
31 .then(() => {
32   console.log('DB connection successful!');
33   const port = process.env.PORT || 3000;
34   app.listen(port, () => {
35     console.log(`App running on port ${port}...`);
36     console.log(`To test the IFT 458 REST App, visit: http://localhost:${port}...`);
37   });
38 })
39 .catch(err => {
40   console.error('DB connection failed!', err);
41 });

```

```

$ node "c:\Users\btrinkle\OneDrive\Desktop\ASU_IFT\Projects\IFT 458_Middleware\Projects\TrinkleMyMainProject\2-Project Authentication And Authorization\server.js"
Connecting to DB: mongodb+srv://btrinkle52:lvfpgisucpaw@btrinklecluster.obkqf.mongodb.net/?retryWrites=true&w=majority&appName=TrinkleCluster
(node:13592) [DEP0040] DeprecationWarning: The 'punycode' module is deprecated. Please use a userland alternative instead.
DB connection successful!
App running on port 4000...
To test the IFT 458 REST App, visit: http://localhost:4000...
[AuthMiddleware] User authenticated: btrinkle1@asu.edu
[ErrorHandler] Missing 404.ejs view file.
[ErrorHandler] 404 - Route not found: /non-existent-route
GET /non-existent-route 404 63.269 ms - 21

```

Method: Attempting to use <http://localhost:4000/non-existent-route>

- Error handling middleware 500


```

114 // Global Error Handler (500 Internal Server Error)
115 app.use((err, req, res, next) => {
116   const isDev = process.env.NODE_ENV === 'development';
117   const viewPath = path.join(__dirname, 'views', '500.ejs');
118
119   if (isDev) {
120     console.error('[ErrorHandling] 500 - Internal Server Error:', err.stack);
121   } else {
122     // ...
123   }
124 }
125
126 zation\server.js"
127 Connecting to DB: mongodb+srv://btrinkle52:lvfGisucpw@btrinklecluster.obkfq.mongodb.net/?retryWrites=true&majority=&appName=TrinkleCluster
128 (node:18684) [DEP0040] DeprecationWarning: The 'punycode' module is deprecated. Please use a userland alternative instead.
129 (Use 'node --trace-deprecation ...' to show where the warning was created)
130 DB connection successful!
131 App running on port 4000...
132 To test the IFT 458 REST App, visit: http://localhost:4000...
133 [Test] Triggering intentional 500 error.
134 [ErrorHandling] 500 - Internal Server Error: Error: Intentional 500 error for testing
135   at c:\Users\btrinkle\OneDrive\Desktop\ASU_IFT\Projects\IFT_458_Middleware\Projects\TrinkleMyMainProject\2-Project Authentication And Authorization\app.js:165:18
136   at Layer.handle [as handle_request] (c:\Users\btrinkle\OneDrive\Desktop\ASU_IFT\Projects\IFT_458_Middleware\Projects\TrinkleMyMainProject\2-Project Authentication And Authorization\node_modules\express\lib\router\layer.js:95:5)
137   at next (c:\Users\btrinkle\OneDrive\Desktop\ASU_IFT\Projects\IFT_458_Middleware\Projects\TrinkleMyMainProject\2-Project Authentication And Authorization\node_modules\express\lib\router\route.js:149:13)
138   at Route.dispatch (c:\Users\btrinkle\OneDrive\Desktop\ASU_IFT\Projects\IFT_458_Middleware\Projects\TrinkleMyMainProject\2-Project Authentication And Authorization\node_modules\express\lib\router\route.js:119:3)
139   at Layer.handle [as handle_request] (c:\Users\btrinkle\OneDrive\Desktop\ASU_IFT\Projects\IFT_458_Middleware\Projects\TrinkleMyMainProject\2-Project Authentication And Authorization\node_modules\express\lib\router\layer.js:95:5)
140   at Function.process_params (c:\Users\btrinkle\OneDrive\Desktop\ASU_IFT\Projects\IFT_458_Middleware\Projects\TrinkleMyMainProject\2-Project Authentication And Authorization\node_modules\express\lib\router\index.js:284:15)
141   at next (c:\Users\btrinkle\OneDrive\Desktop\ASU_IFT\Projects\IFT_458_Middleware\Projects\TrinkleMyMainProject\2-Project Authentication And Authorization\node_modules\express\lib\router\index.js:280:10)
142   at SendStream.error (c:\Users\btrinkle\OneDrive\Desktop\ASU_IFT\Projects\IFT_458_Middleware\Projects\TrinkleMyMainProject\2-Project Authentication And Authorization\node_modules\serve-static\index.js:121:7)
143   at SendStream.emit (node:events:524:28)
144 [ErrorHandling] Missing 500.ejs view file.
145 GET /trigger-500 500 8.387 ms - 28
146

```

Method: Need to add a bug to app.js where it attempts to call a route that is not defined. For this test I defined as trigger-500. Then I use the route to trigger error 500.