

Full Stack Development with MERN

API Development and Integration Report

Date	12 th July 2024
Team ID	SWTID1719933594
Project Name	Project - SHOPEZ
Maximum Marks	

Project Title: SHOPEZ – The E-COMMERCE APP

Date: 12th July 2024

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Objective

This report aims to document the API development progress and key aspects of the backend services implementation for the Shopez – Ecommerce app project.

Technologies Used

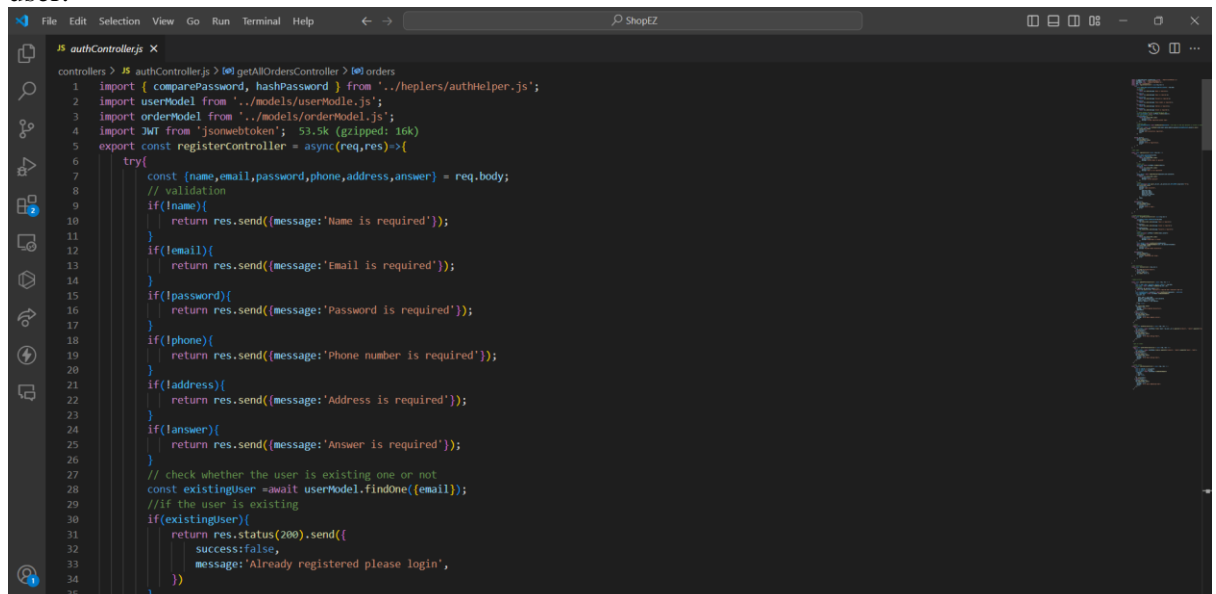
- **Backend Framework:** Node.js with Express.js
- **Database:** MongoDB
- **Authentication:** JWT

Key Directories and Files

/Controllers: Contains function to handle requests and responses.

- **authControllers**

Used to authenticate/ handle the requests and responses between the server and the user.



```
1 import { comparePassword, hashPassword } from '../helpers/authHelper.js';
2 import userModel from '../models/userModel.js';
3 import orderModel from '../models/orderModel.js';
4 import JWT from 'jsonwebtoken';
5 export const registerController = async (req, res) => {
6   try {
7     const { name, email, password, phone, address, answer } = req.body;
8     // validation
9     if (!name) {
10       return res.send({ message: 'Name is required' });
11     }
12     if (!email) {
13       return res.send({ message: 'Email is required' });
14     }
15     if (!password) {
16       return res.send({ message: 'Password is required' });
17     }
18     if (!phone) {
19       return res.send({ message: 'Phone number is required' });
20     }
21     if (!address) {
22       return res.send({ message: 'Address is required' });
23     }
24     if (!answer) {
25       return res.send({ message: 'Answer is required' });
26     }
27     // check whether the user is existing one or not
28     const existingUser = await userModel.findOne({ email });
29     // if the user is existing
30     if (existingUser) {
31       return res.status(200).send({
32         success: false,
33         message: 'Already registered please login',
34       });
35     }
36   } catch (error) {
37     console.log(error);
38     return res.status(500).send({
39       success: false,
40       message: 'Internal server error',
41     });
42   }
43 }
```

```
36 //register user
37 const hashedPassword = await hashPassword(password); //the logic to the hash password is written in authHelper.js file
38 //save
39 const user = await new userModel({name,email,phone,address,password:hashedPassword,answer}).save()
40 res.status(201).send({
41   success:true,
42   message:'User Successfully registered',
43   user,
44 })
45
46
47 }catch (error){
48   console.log(error);
49   res.status(500).send({
50     success:false,
51     message:'error in registration',
52     error
53   })
54 }
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```

```
JS authController.js M X
controllers > JS authController.js > ...
110 //forget password controller
111 export const forgetPasswordController= async(req,res)=>{
112   try{
113     const {email,answer,newPassword}=req.body
114     if(!email){
115       res.status(400).send({message:'Email is required'})
116     }
117     if(!answer){
118       res.status(400).send({message:'Answer is required'})
119     }
120     if(!newPassword){
121       res.status(400).send({message:'Password is required'})
122     }
123     //check
124     const user=await userModel.findOne({email,answer})
125     //validation
126     if(!user){
127       return res.status(404).send({
128         success:false,
129         message:'Wrong Email or Answer'
130       })
131     }
132     const hashed = await hashPassword(newPassword);
133     await userModel.findByIdAndUpdate(user._id,{password:hashed});
134     res.status(200).send({
135       success:true,
136       message:'Password Reset Successfully',
137     })
138   }
139   catch(error){
140     console.log(error)
141     res.status(500).send({
142       success:'Something went wrong',
143       error
144     })
145   }
146 }
```

```
JS authController.js M X
controllers > JS authController.js > ...
150 //Test controller
151 export const testController =(req,res)=>{
152   try {
153     res.send("Protected Routes");
154   } catch (error) {
155     console.log(error);
156     res.send( error );
157   }
158 };
159
```

```
JS authController.js M X
controllers > JS authController.js > testController
160 //update profile
161
162
163 export const updateProfileController = async (req, res) => {
164   try {
165     const { name, email, password, address, phone } = req.body;
166     const user = await userModel.findById(req.user._id);
167     //password
168     if (password && password.length < 6) {
169       return res.json({ error: "Password is required and 6 character long" });
170     }
171     const hashedPassword = password ? await hashPassword(password) : undefined;
172     const updatedUser = await userModel.findByIdAndUpdate(
173       req.user._id,
174       {
175         name: name || user.name,
176         password: hashedPassword || user.password,
177         phone: phone || user.phone,
178         address: address || user.address,
179       },
180       { new: true }
181     );
182     res.status(200).send({
183       success: true,
184       message: "Profile Updated Successfully",
185       updatedUser,
186     });
187   } catch (error) {
188     console.log(error);
189     res.status(400).send({
190       success: false,
191       message: "Error While Update profile",
192       error,
193     });
194   }
195 };
196
```

```
JS authController.js M X
controllers > JS authController.js > testController

197 //orders
198 export const getOrdersController = async (req, res) => {
199   try {
200     const orders = await orderModel.find({ buyer: req.user._id }).populate("products", "-photo").populate("buyer", "name");
201     res.json(orders);
202   } catch (error) {
203     console.log(error);
204     res.status(500).send({
205       success: false,
206       message: "Error While Getting Orders",
207       error,
208     });
209   }
210 };
211
212 //get all orders
213
214 //orders
215 export const getAllOrdersController = async (req, res) => {
216   try {
217     const orders = await orderModel.find({}).populate("products", "-photo").populate("buyer", "name");
218     res.json(orders);
219   } catch (error) {
220     console.log(error);
221     res.status(500).send({
222       success: false,
223       message: "Error While Getting Orders",
224       error,
225     });
226   }
227 };
```

```
JS authController.js M X
controllers > JS authController.js > testController

229 //order status
230 export const orderStatusController = async (req, res) => {
231   try {
232     const { orderId } = req.params;
233     const { status } = req.body;
234     const orders = await orderModel.findByIdAndUpdate(
235       orderId,
236       { status },
237       { new: true }
238     );
239     res.json(orders);
240   } catch (error) {
241     console.log(error);
242     res.status(500).send({
243       success: false,
244       message: "Error While Updateing Order",
245       error,
246     });
247   }
248 };
249
250
251
252
253
```

categoryController:

To handle the post, get, update, and delete categories of products in the server. To handle the categories in the client site and handle the order functions.

```
JS categoryController.js X
controllers > JS categoryController.js > ...

1 import categoryModel from "../models/categoryModel.js";
2 import slugify from "slugify"; // 8.8k (gzipped: 3.8k)
3 export const createCategoryController = async (req, res) => {
4   try {
5     const { name } = req.body;
6     if (!name) {
7       return res.status(401).send({ message: "Name is required" });
8     }
9     const existingCategory = await categoryModel.findOne({ name });
10    if (existingCategory) {
11      return res.status(200).send({
12        success: true,
13        message: "Category Already Exisits",
14      });
15    }
16    const category = await new categoryModel({
17      name,
18      slug: slugify(name),
19    }).save();
20    res.status(201).send({
21      success: true,
22      message: "new category created",
23      category,
24    });
25  } catch (error) {
26    console.log(error);
27    res.status(500).send({
28      success: false,
29      error,
30      message: "Errro in Category",
31    });
32  }
33 };
34
```

```
JS categoryController.js X
controllers > JS categoryController.js > ...
35 //update category
36 export const updateCategoryController = async (req, res) => {
37   try {
38     const { name } = req.body;
39     const { id } = req.params;
40     const category = await categoryModel.findByIdAndUpdate(
41       id,
42       { name, slug: slugify(name) },
43       { new: true }
44     );
45     res.status(200).send({
46       success: true,
47       message: "Category Updated Successfully",
48       category,
49     });
50   } catch (error) {
51     console.log(error);
52     res.status(500).send({
53       success: false,
54       error,
55       message: "Error while updating category",
56     });
57   }
58 }
59
```

```
JS categoryController.js X
controllers > JS categoryController.js > ...
60 // get all category
61 export const categoryController = async (req, res) => {
62   try {
63     const category = await categoryModel.find({});
64     res.status(200).send({
65       success: true,
66       message: "All categories List",
67       category,
68     });
69   } catch (error) {
70     console.log(error);
71     res.status(500).send({
72       success: false,
73       error,
74       message: "Error while getting all categories",
75     });
76   }
77 }
78
79 // single category
80 export const singleCategoryController = async (req, res) => {
81   try {
82     const category = await categoryModel.findOne({ slug: req.params.slug });
83     res.status(200).send({
84       success: true,
85       message: "Get Single Category Successfully",
86       category,
87     });
88   } catch (error) {
89     console.log(error);
90     res.status(500).send({
91       success: false,
92       error,
93       message: "Error While getting Single Category",
94     });
95   }
96 }

```

```
JS categoryController.js X
controllers > JS categoryController.js > ...
97 //delete category
98 export const deleteCategoryController = async (req, res) => {
99   try {
100     const { id } = req.params;
101     await categoryModel.findByIdAndDelete(id);
102     res.status(200).send({
103       success: true,
104       message: "Category Deleted Successfully",
105     });
106   } catch (error) {
107     console.log(error);
108     res.status(500).send({
109       success: false,
110       message: "error while deleting category",
111       error,
112     });
113   }
114 }
115 }

```

productController:

To handle the post, get, update, and delete products in the server. To handle the filters in client-side and handle the payment gateway

```
File Edit Selection View Go Run Terminal Help ShopEZ
productController.js X
controllers > JS productController.js > ...
1 import productModel from "../models/productModel.js"
2 import categoryModel from "../models/categoryModel.js"
3 import fs from 'fs'
4 import slugify from "slugify"; 8.8k (gzipped: 3.8k)
5 import braintree from "braintree"; 267.1k (gzipped: 61k)
6 import dotenv from 'dotenv'; 6.8k (gzipped: 3k)
7 import orderModel from "../models/orderModel.js";
8
9 dotenv.config();
10
11 //payment gateway
12 var gateway = new braintree.BraintreeGateway({
13   environment: braintree.Environment.Sandbox,
14   merchantId: process.env.BRAINTREE_MERCHANT_ID,
15   publicKey: process.env.BRAINTREE_PUBLIC_KEY,
16   privateKey: process.env.BRAINTREE_PRIVATE_KEY,
17 });
18
```

```
File Edit Selection View Go Run Terminal Help ShopEZ
productController.js X
controllers > JS productController.js > ...
20 export const createProductController = async(req,res)->{
21   try{
22     const { name, description, price, category, quantity, shipping } =
23       req.fields;
24     const { photo } = req.files;
25     //validation
26     switch (true) {
27       case !name:
28         return res.status(500).send({ error: "Name is Required" });
29       case !description:
30         return res.status(500).send({ error: "Description is Required" });
31       case !price:
32         return res.status(500).send({ error: "Price is Required" });
33       case !category:
34         return res.status(500).send({ error: "Category is Required" });
35       case !quantity:
36         return res.status(500).send({ error: "Quantity is Required" });
37       case photo && photo.size > 1000000:
38         return res
39           .status(500)
40           .send({ error: "photo is Required and should be less then 1mb" });
41     }
42
43     const products = new productModel({ ...req.fields, slug: slugify(name) });
44     if (photo) {
45       products.photo.data = fs.readFileSync(photo.path);
46       products.photo.contentType = photo.type;
47     }
48     await products.save();
49     res.status(201).send({
50       success: true,
51       message: "Product Created Successfully",
52       products,
53     });
54   } catch (error) {
55     console.log(error);
56   }
57 }
```

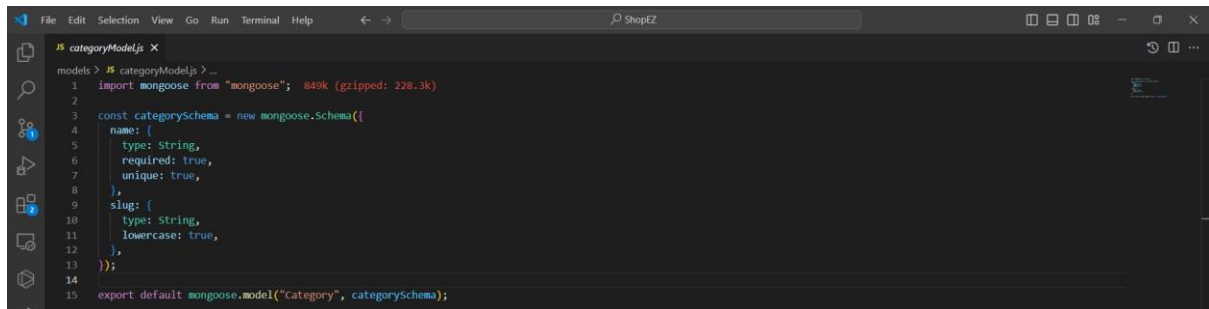
```
File Edit Selection View Go Run Terminal Help ShopEZ
productController.js X
controllers > JS productController.js > ...
65 //get all products
66 export const getProductController = async (req, res) => {
67   try {
68     const products = await productModel
69       .find({})
70       .populate("category")
71       .select("-photo")
72       .limit(12)
73       .sort({ createdAt: -1 });
74     res.status(200).send({
75       success: true,
76       countTotal: products.length,
77       message: "All Products ",
78       products,
79     });
80   } catch (error) {
81     console.log(error);
82     res.status(500).send({
83       success: false,
84       message: "Error in getting products",
85       error: error.message,
86     });
87   }
88 };
89 // get single product
90 export const getSingleProductController = async (req, res) => {
91   try {
92     const product = await productModel
93       .findOne({ slug: req.params.slug })
94       .select("-photo")
95       .populate("category");
96     res.status(200).send({
97       success: true,
98       message: "Single Product Fetched",
99       product,
100     });
101   } catch (error) {
102     console.log(error);
103   }
104 }
```

/models

Includes Mongoose schemas and models for MongoDB collection.

categoryModels:

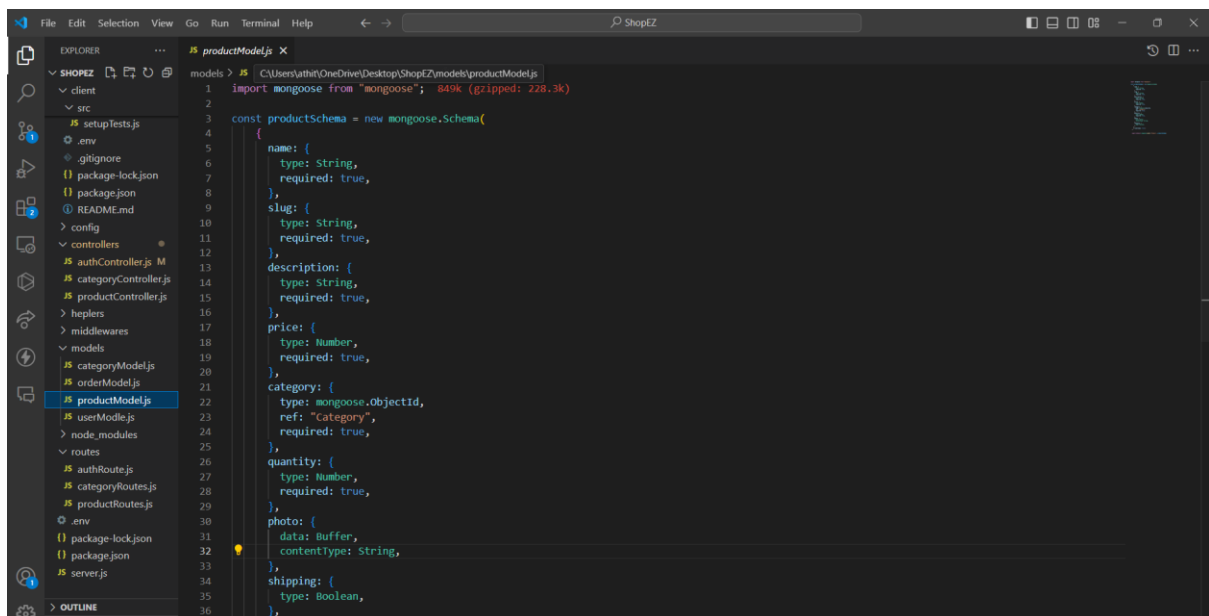
To create a collection 'Category' in MongoDB local host using Mongoose to store the data of categories of products in the server.

A screenshot of a Visual Studio Code editor window. The file explorer on the left shows a project named 'ShopEZ' with a 'models' directory. The 'categoryModel.js' file is open in the editor. The code defines a Mongoose schema for a 'category' with fields 'name' and 'slug', both of type 'String', required, and unique. The 'slug' field is also lowercase. The schema is then registered with Mongoose.

```
1 import mongoose from "mongoose";
2
3 const categorySchema = new mongoose.Schema({
4   name: {
5     type: String,
6     required: true,
7     unique: true,
8   },
9   slug: {
10    type: String,
11    lowercase: true,
12  },
13 });
14
15 export default mongoose.model("category", categorySchema);
```

productModels:

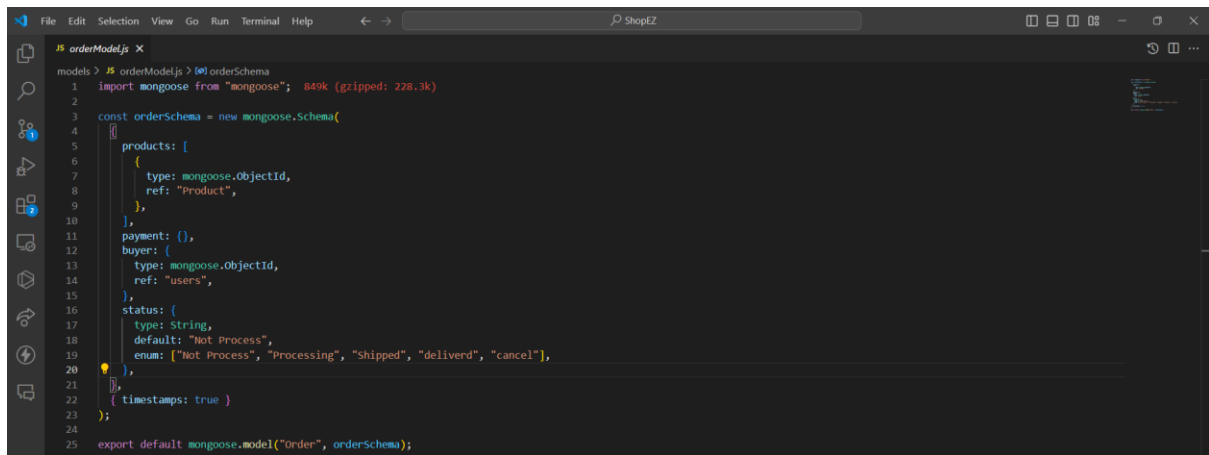
To create a collection 'Product' in MongoDB local host using Mongoose to store the data of products in the server.

A screenshot of a Visual Studio Code editor window. The file explorer on the left shows the 'ShopEZ' project with the 'productModel.js' file selected in the 'models' directory. The editor shows the code for the 'product' schema, which includes fields for 'name', 'slug', 'description', 'price', 'category' (a reference to the 'category' model), 'quantity', 'photo' (a buffer with content type), and 'shipping'. The schema is then registered with Mongoose.

```
1 import mongoose from "mongoose";
2
3 const productSchema = new mongoose.Schema(
4   {
5     name: {
6       type: String,
7       required: true,
8     },
9     slug: {
10      type: String,
11      required: true,
12    },
13     description: {
14       type: String,
15       required: true,
16     },
17     price: {
18       type: Number,
19       required: true,
20     },
21     category: {
22       type: mongoose.ObjectId,
23       ref: "Category",
24       required: true,
25     },
26     quantity: {
27       type: Number,
28       required: true,
29     },
30     photo: {
31       data: Buffer,
32       contentType: String,
33     },
34     shipping: {
35       type: Boolean,
36     },
37   },
38   { timestamps: true }
39 );
40
41 export default mongoose.model("Product", productSchema);
```

orderModel:

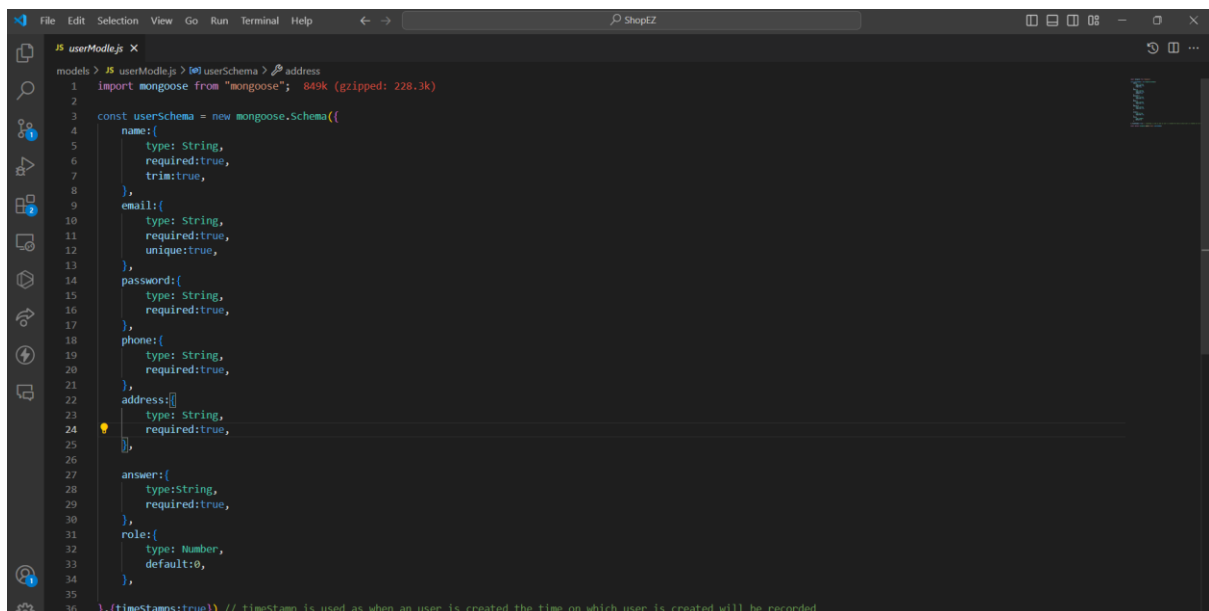
To create a collection of 'orders' in MongoDB local host using Mongoose to store the data of orders that are ordered by the user in the server.



```
orderModel.js
models > JS orderModel.js > [0] orderSchema
1 import mongoose from "mongoose"; 849k (gzipped: 228.3k)
2
3 const orderSchema = new mongoose.Schema(
4   {
5     products: [
6       {
7         type: mongoose.ObjectId,
8         ref: "Product",
9       },
10    ],
11    payment: {},
12    buyer: {
13      type: mongoose.ObjectId,
14      ref: "users",
15    },
16    status: {
17      type: String,
18      default: "Not Process",
19      enum: ["Not Process", "Processing", "Shipped", "delivered", "cancel"],
20    },
21  },
22  { timestamps: true }
23 );
24
25 export default mongoose.model("Order", orderSchema);
```

userModel:

To create a collection for ' users' in MongoDB local host using Mongoose to store the data of users that registered in the site.



```
userModel.js
models > JS userModel.js > [0] userSchema > address
1 import mongoose from "mongoose"; 849k (gzipped: 228.3k)
2
3 const userSchema = new mongoose.Schema({
4   name: {
5     type: String,
6     required: true,
7     trim: true,
8   },
9   email: {
10     type: String,
11     required: true,
12     unique: true,
13   },
14   password: {
15     type: String,
16     required: true,
17   },
18   phone: {
19     type: String,
20     required: true,
21   },
22   address: {
23     type: String,
24     required: true,
25   },
26   answer: {
27     type: String,
28     required: true,
29   },
30   role: {
31     type: Number,
32     default: 0,
33   },
34 }, { timestamps: true }); // timestamp is used as when an user is created the time on which user is created will be recorded
35
```

/routes:

Defines the API endpoints and links to the functions

authRoutes:

The authRoutes is used for defining API endpoints for registering, login, forget-password, profile update, and order controlling and this all links to the authController function.

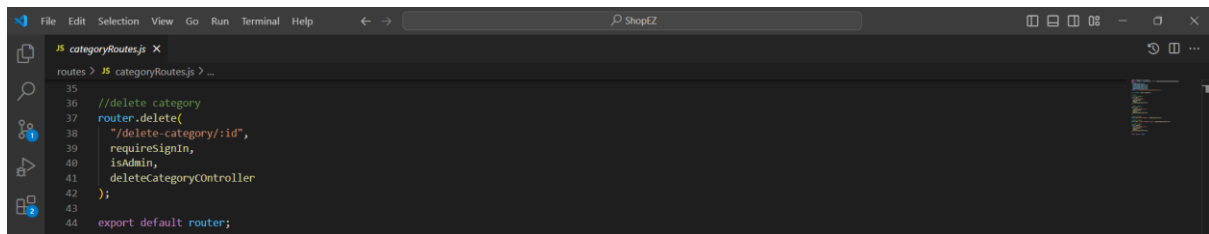

```
File Edit Selection View Go Run Terminal Help ShopEZ
JS authRoute.js X
routes > JS authRoute.js > ...
1 import express from 'express';
2 import { registerController, loginController, testController, forgetPasswordController, updateProfileController, getOrdersController, getAllOrdersController, orderStatusCon
3 import { isAdmin, requireSignIn } from '../middlewares/authMiddlewares.js';
4 //router object
5 const router = express.Router()
6
7 //routing
8 //Register || Method POST
9 router.post('/register',registerController);
10
11 //Login || Method POST
12 router.post('/login',loginController)
13
14 //forget password
15 router.post('/forgot-password',forgetPasswordController)
16 //test routes
17 router.get('/test',requireSignIn,isAdmin,testController)
18
19 // protected user route-auth
20 router.get('/user-auth',requireSignIn, (req,res)=>{
21   res.status(200).send({ok:true})
22 })
23 // protected admin route-auth
24 router.get('/admin-auth',requireSignIn,isAdmin, (req,res)=>{
25   res.status(200).send({ok:true})
26 })
27
```

```
File Edit Selection View Go Run Terminal Help ShopEZ
JS authRoute.js X
routes > JS authRoute.js > ...
28 //
29 //update profile
30 router.put('/profile',requireSignIn,updateProfileController)
31
32 //orders
33 router.get("/orders", requireSignIn, getOrdersController);
34
35 // all orders
36 router.get('/all-orders',requireSignIn, isAdmin, getAllOrdersController)
37
38
39
40 //order status update
41 router.put({
42   "/order-status/:orderId",
43   requireSignIn,
44   isAdmin,
45   orderStatusController
46 });
47
48
49 export default router;
```

categoryRoutes:

The categoryRoutes is used to define the API endpoints like the post, put, get, and delete of Categories of products and these are linked to the categoryController function.

```
File Edit Selection View Go Run Terminal Help ShopEZ
JS categoryRoutes.js X
routes > JS categoryRoutes.js > ...
1 import express from "express";
2 import { isAdmin, requireSignIn } from "../middlewares/authMiddlewares.js";
3 import {
4   categoryController,
5   createCategoryController,
6   deleteCategoryController,
7   singleCategoryController,
8   updateCategoryController,
9 } from "../controllers/categoryController.js";
10
11 const router = express.Router();
12
13 //routes
14 // create category
15 router.post(
16   "/create-category",
17   requireSignIn,
18   isAdmin,
19   createCategoryController
20 );
21
22 //update category
23 router.put(
24   "/update-category/:id",
25   requireSignIn,
26   isAdmin,
27   updateCategoryController
28 );
29
30 //getAll category
31 router.get("/get-category", categoryController);
32
33 //single category
34 router.get("/single-category/:slug", singleCategoryController);
35
```

A screenshot of the Visual Studio Code editor showing a file named 'categoryRoutes.js'. The file contains a single route definition for deleting a category. The code is as follows:

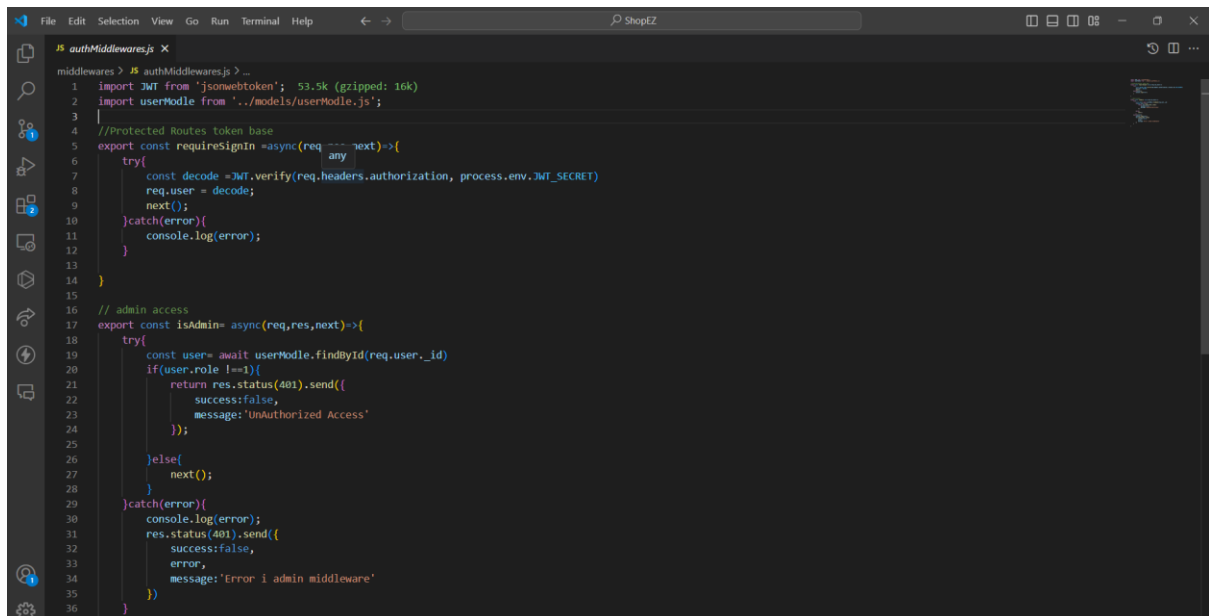
```
35 //delete category
36
37 router.delete(
38   "/delete-category/:id",
39   requireSignIn,
40   isAdmin,
41   deleteCategoryController
42 );
43
44 export default router;
```

/middlewares:

Custom middleware functions for request processing.

authmiddlewares:

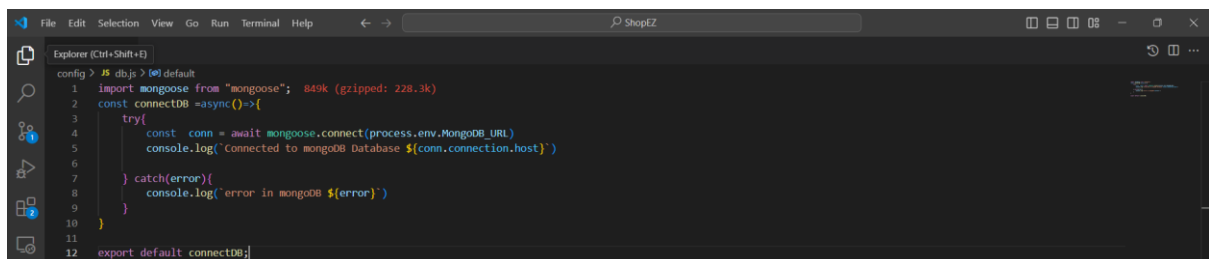
it is a function from the user side to request a process

A screenshot of the Visual Studio Code editor showing a file named 'authMiddlewares.js'. The file contains two middleware functions: 'requireSignIn' and 'isAdmin'. The code is as follows:

```
1 import JWT from 'jsonwebtoken'; // 53.5k (gzipped: 16k)
2 import userModel from '../models/userModel.js';
3
4 //Protected Routes token base
5 export const requireSignIn = async (req, res, next) => {
6   try {
7     const decode = JWT.verify(req.headers.authorization, process.env.JWT_SECRET);
8     req.user = decode;
9     next();
10  } catch (error) {
11    console.log(error);
12  }
13 }
14
15 // admin access
16 export const isAdmin = async (req, res, next) => {
17   try {
18     const user = await userModel.findById(req.user._id);
19     if (user.role !== 1) {
20       return res.status(401).send({
21         success: false,
22         message: 'Unauthorized Access'
23       });
24     } else {
25       next();
26     }
27   } catch (error) {
28     console.log(error);
29     res.status(401).send({
30       success: false,
31       error,
32       message: 'Error in admin middleware'
33     });
34   }
35 }
36
37 export default;
```

/config:

Configuration files for database connections, environment variables, etc.

A screenshot of the Visual Studio Code editor showing a file named 'config.js'. The file contains a function 'connectDB' that connects to a MongoDB database. The code is as follows:

```
1 import mongoose from 'mongoose'; // 849k (gzipped: 228.3k)
2 const connectDB = async () => {
3   try {
4     const conn = await mongoose.connect(process.env.MONGODB_URL);
5     console.log(`Connected to mongoDB Database ${conn.connection.host}`);
6   } catch (error) {
7     console.log(`error in mongoDB ${error}`);
8   }
9 }
10
11 export default connectDB;
```

API Endpoints

User/Admin Authentication:

POST /api/v1/auth/register – To register a new user

POST /api/v1/auth/login – To login into the website

POST /api/v1/auth/forgot-password – If the user forgets his/her password they can update it.

User Management:

GET /api/v1/auth/orders – to get the order details done by the user.

PUT /api/v1/auth/profile – To update the users profile

GET/api/v1/product/braintree/payment – take users to payment gateway

GET/api/v1/product/product-category/{params.slug} – to get product by category

GET /api/v1/category/get-category – To get all categories of products

GET /api/v1/product/product-list/{page}- To get product list by loading more in the page

GET/api/v1/product/product-count – To get total count of products

POST/api/v1/product/product-filters – To filter the products

GET/api/v1/product/related-product – To get similar product details

GET/api/v1/product/get-product/{params.slug} -To get a particular product

Admin Management

GET/api/v1/auth/all-orders – To get all the orders of the users

PUT/api/v1/auth/order-status/{orderId}- to change/ update the status of the order done by the user

POST/api/v1/category/create-category – to create category

GET/api/v1/category/update-category/{selected._id}: to update category based on the id of the category

DELETE/api/v1/product/delete-category/{pid} – to delete the category based on the id

POST/api/v1/product/create-product – to create product

GET/api/v1/product/get-product – to get all products

PUT/api/v1/product/update-product – to update product

DELETE/api/v1/product/delete-product/\${id} – to delete product based on the id

GET/api/v1/product/search/\${values.keyword} to search products based on keywords

Integration with Frontend

The backend communicates with the frontend via RESTful APIs. Key points of integration include:

- **Authentication and Authorization:**

- **Login/Signup:** Endpoints for user registration and login.
- **Token Management:** Using JWT (JSON Web Tokens) or other token systems to manage user sessions.
- **Authorization:** Middleware to protect certain routes based on user roles or permissions.

- **Data Retrieval and Manipulation:**

- **CRUD Operations:** Endpoints for Create, Read, Update, and Delete operations for various resources (e.g., products, users, orders).
- **Filtering and Sorting:** Parameters to filter and sort data based on specific criteria.
- **Pagination:** Handling large datasets by implementing pagination.

- **File Upload and Management:**

- **Image Upload:** Endpoints for uploading and managing images (e.g., product images).

- **Notifications and Messaging:**

- **Real-time Updates:** Using react-hot-tast for real-time notifications.

- **Payment Processing:**

- **Payment Gateways:** Integration with payment gateways (PayPal) for processing payments.
- **Order Management:** Handling order creation, updating payment status, and managing refunds.

Security:

Data Validation: Ensuring that data sent to the server is validated and sanitized.

Data fetching:

Axios : it is a JS library used for making HTTP requests from a web browser or Node.js/ it is used to fetch data from the server side and display it in the react side.

Error Handling and Validation

- **Error Handling:** Created and integrated a centralized error handling middleware to manage errors consistently across the application
- **Validation:** A middleware is applied to the POST route to ensure that incoming requests meet the specified criteria

Security Considerations

Authentication:

- **JWT Tokens:** JSON Web Tokens (JWT) is used for securely transmitting information between the client and server.
- **Token Expiration:** An expiration time for JWT tokens is set to reduce the risk of token misuse.

CORS (Cross-Origin Resource Sharing)

Enable CORS to restrict resources to specific domains and prevent unauthorized access.

Secure Data Storage

Encrypted the passwords and other sensitive information before storing them in the database.

Environment Variables

Use environment variables (dotenv) to store sensitive information such as API keys, database credentials, and secret keys.

