

BỘ GIÁO DỤC VÀ ĐÀO TẠO
TRƯỜNG ĐẠI HỌC CẦN THƠ
TRƯỜNG CÔNG NGHỆ THÔNG TIN & TRUYỀN THÔNG



PHÁT TRIỂN ỨNG DỤNG WEB

NỘI DUNG:
THỰC HÀNH 1: BACKEND 1

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MỤC LỤC

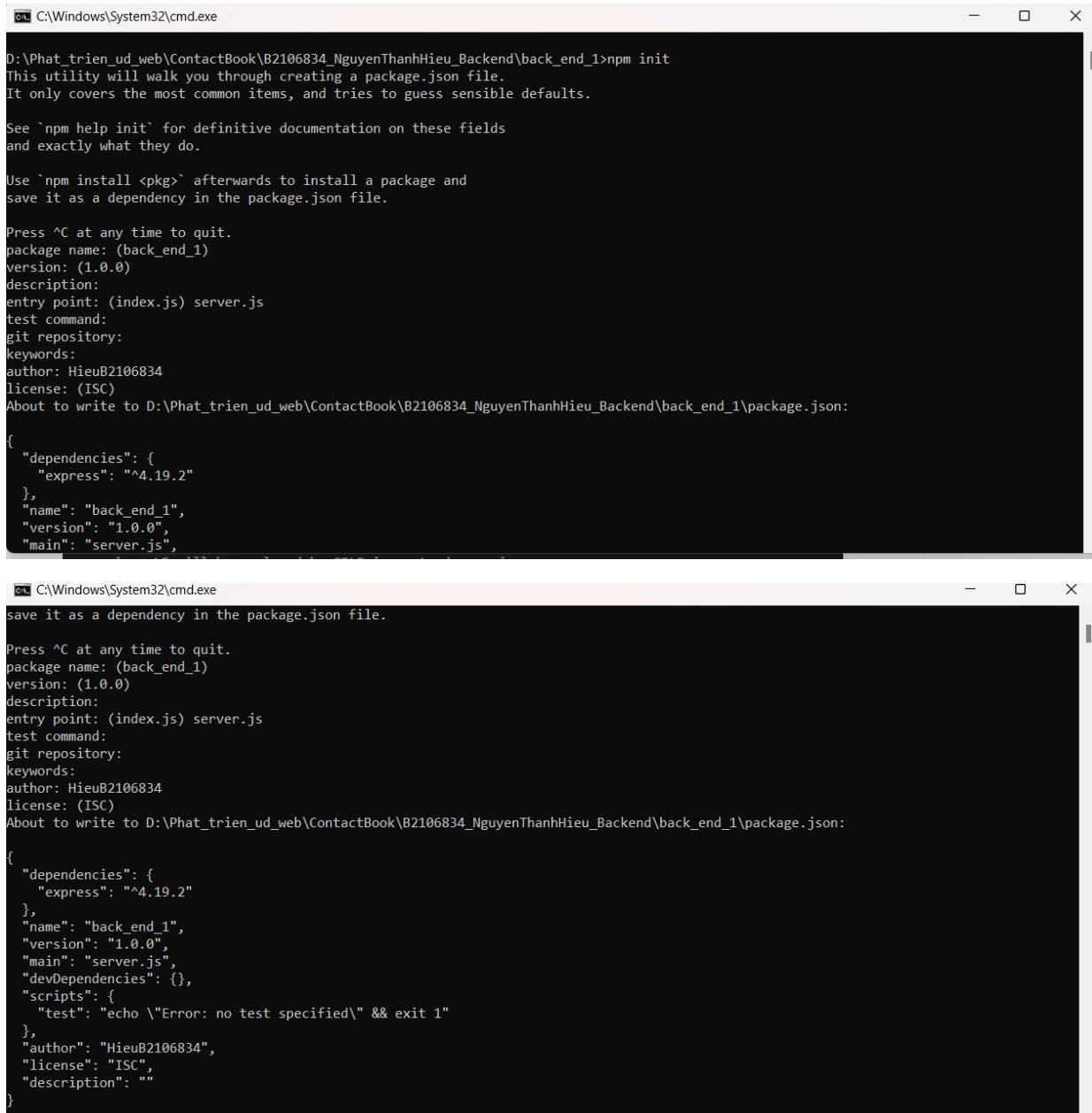
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1. THỰC HÀNH 1: BACKEND 1

1.1 BƯỚC 1: Tạo Ứng Dụng Node

1.1.1 Khởi tạo dự án

npm init



The first screenshot shows the command prompt window titled 'C:\Windows\System32\cmd.exe'. The user has entered 'D:\Phat_trien_ud_web\ContactBook\B2106834_NguyenThanhHieu_Backend\back_end_1>npm init'. The output shows the utility walking through the creation of a package.json file, asking for package name, version, description, entry point, test command, git repository, keywords, author, and license. The user has entered 'back_end_1' for package name, '1.0.0' for version, and 'ISC' for license. The output shows the resulting package.json file with the following content:

```
{
  "dependencies": {
    "express": "^4.19.2"
  },
  "name": "back_end_1",
  "version": "1.0.0",
  "main": "server.js",
  "devDependencies": {},
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "author": "HieuB2106834",
  "license": "ISC",
  "description": ""
}
```

The second screenshot shows the same command prompt window. The user has entered 'npm install express cors'. The output shows the packages being installed and the resulting package.json file with the following content:

```
{
  "dependencies": {
    "express": "^4.19.2",
    "cors": "^2.8.5"
  },
  "name": "back_end_1",
  "version": "1.0.0",
  "main": "server.js",
  "devDependencies": {},
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "author": "HieuB2106834",
  "license": "ISC",
  "description": ""
}
```

npm install express cors

```
C:\Windows\System32\cmd.exe

D:\B2106834_NguyenThanhHieu_Backend_1>npm install express cors

added 66 packages, and audited 67 packages in 3s

12 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities

D:\B2106834_NguyenThanhHieu_Backend_1>
```

1.2 BƯỚC 2: Quản Lý Mã Nguồn Dự Án Với Git Và Github

npx gitignore node

git init

git status

```
C:\Windows\System32\cmd.exe

D:\Phat_trien_ud_web\ContactBook\B2106834_NguyenThanhHieu_Backend\back_end_1>
D:\Phat_trien_ud_web\ContactBook\B2106834_NguyenThanhHieu_Backend\back_end_1>npx gitignore node
Need to install the following packages:
gitignore@0.7.0
Ok to proceed? (y) y

Created .gitignore file for flag type node.

D:\Phat_trien_ud_web\ContactBook\B2106834_NguyenThanhHieu_Backend\back_end_1>git init
Reinitialized existing Git repository in D:/Phat_trien_ud_web/ContactBook/B2106834_NguyenThanhHieu_Backend/back_end_1/.git/

D:\Phat_trien_ud_web\ContactBook\B2106834_NguyenThanhHieu_Backend\back_end_1>git status
On branch master

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        .gitignore
        package-lock.json
        package.json

nothing added to commit but untracked files present (use "git add" to track)

D:\Phat_trien_ud_web\ContactBook\B2106834_NguyenThanhHieu_Backend\back_end_1>git add .gitignore package-lock.json package.json
warning: in the working copy of '.gitignore', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'package-lock.json', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'package.json', LF will be replaced by CRLF the next time Git touches it
```

```
C:\Windows\System32\cmd.exe

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        .gitignore
        package-lock.json
        package.json

nothing added to commit but untracked files present (use "git add" to track)

D:\B2106834_NguyenThanhHieu_Backend_1>git add .gitignore package-lock.json package.json
warning: in the working copy of '.gitignore', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'package-lock.json', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'package.json', LF will be replaced by CRLF the next time Git touches it

D:\B2106834_NguyenThanhHieu_Backend_1>git status
On branch main

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   .gitignore
        new file:   package-lock.json
        new file:   package.json

D:\B2106834_NguyenThanhHieu_Backend_1>
```

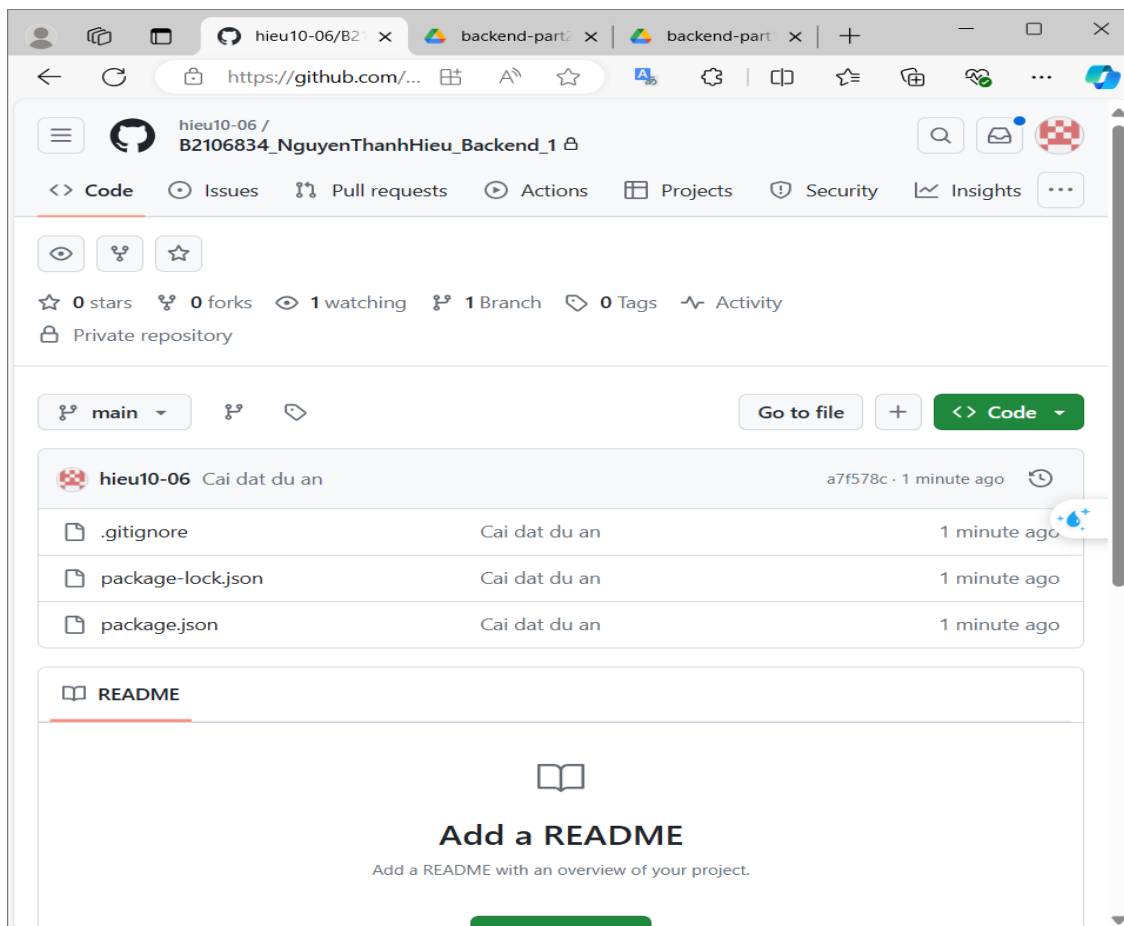
```
C:\Windows\System32\cmd.exe

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
    new file:   .gitignore
    new file:   package-lock.json
    new file:   package.json

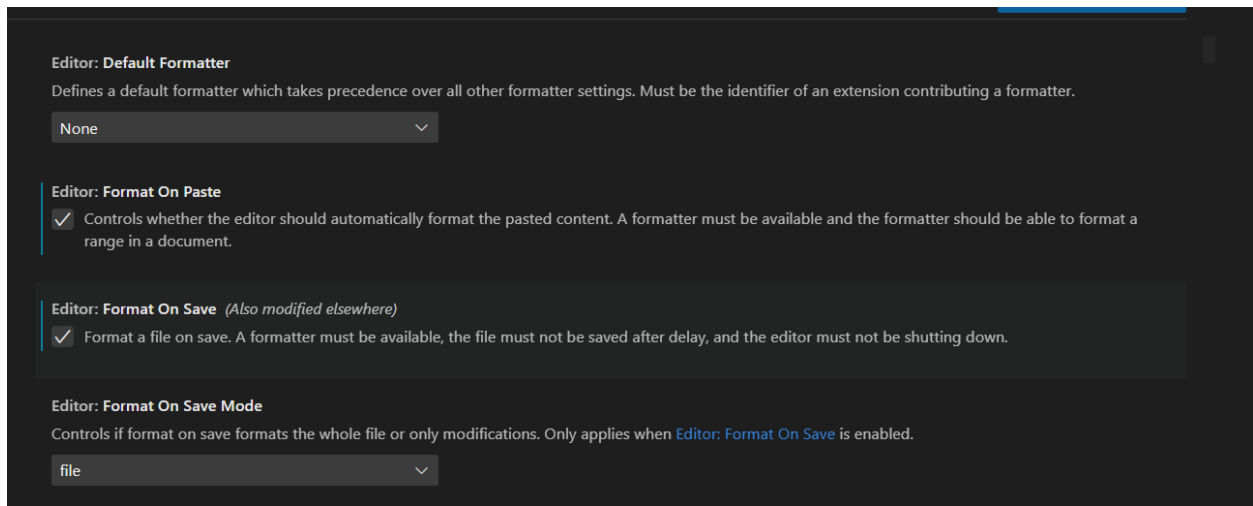
D:\B2106834_NguyenThanhHieu_Backend_1>git commit -m "Cai dat du an"
[main (root-commit) a7f578c] Cai dat du an
 3 files changed, 929 insertions(+)
 create mode 100644 .gitignore
 create mode 100644 package-lock.json
 create mode 100644 package.json

D:\B2106834_NguyenThanhHieu_Backend_1>git push
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 8 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 8.72 KiB | 4.36 MiB/s, done.
Total 5 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/hieu10-06/B2106834_NguyenThanhHieu_Backend_1.git
 * [new branch]      main -> main
```

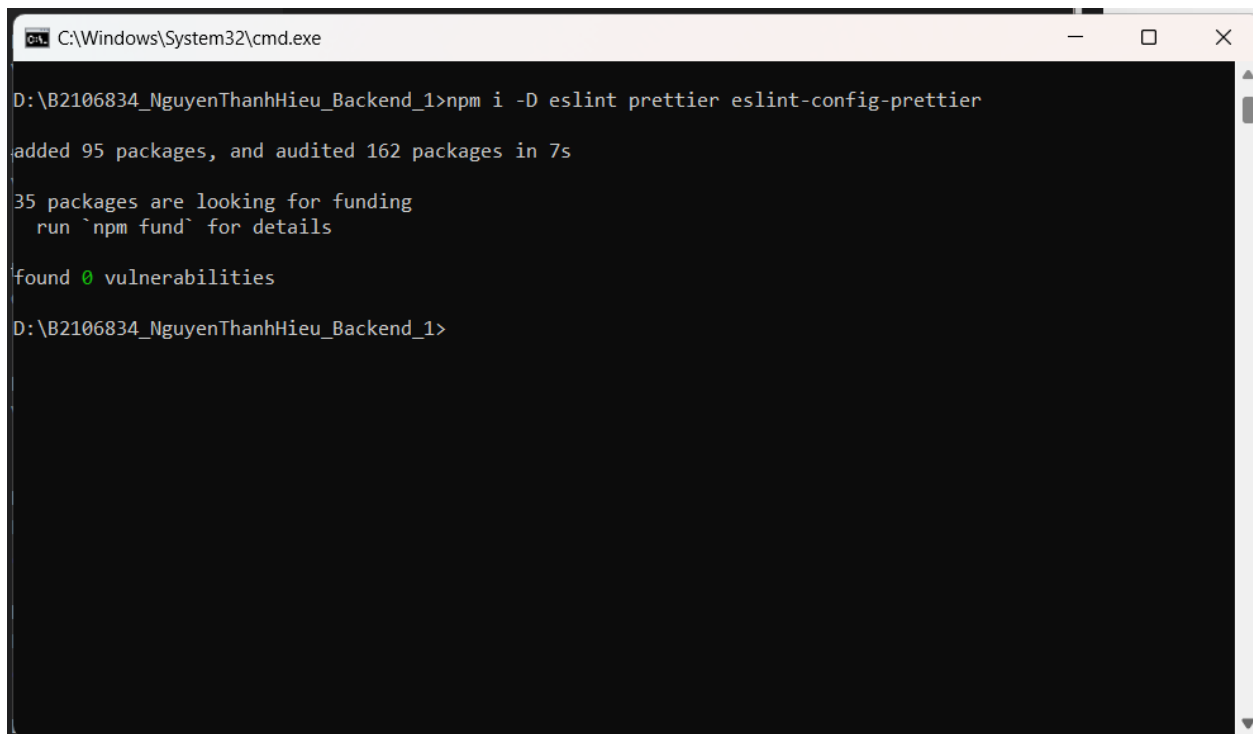


1.3 BƯỚC 3: Cấu Hình Visual Studio Code, ESLint Và Prettier

1.3.1 Cài đặt:



`npm i -D eslint prettier eslint-config-prettier`



1.3.2 Tạo tập tin `.eslintrc.js`

```
You, last month | 1 author (You)
1 module.exports = {
2   env: {
3     node: true,
4     commonjs: true,
5     es2021: true,
6   },
7   extends: ['eslint:recommended', 'prettier'],
8 };
```

1.3.3 Lưu thay đổi lên git:

```
C:\Windows\System32\cmd.exe
Successfully created D:\B2106834_NguyenThanhHieu_Backend_1\eslint.config.mjs file.

D:\B2106834_NguyenThanhHieu_Backend_1>git add -u
warning: in the working copy of 'package-lock.json', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'package.json', LF will be replaced by CRLF the next time Git touches it

D:\B2106834_NguyenThanhHieu_Backend_1>git add .eslintrc.js

D:\B2106834_NguyenThanhHieu_Backend_1>git commit -m "Cau hinh ESLint cho du an"
[main 5beb7f1] Cau hinh ESLint cho du an
3 files changed, 1474 insertions(+), 5 deletions(-)
create mode 100644 .eslintrc.js

D:\B2106834_NguyenThanhHieu_Backend_1>git push
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 8 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 20.18 KiB | 10.09 MiB/s, done.
Total 5 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/hieu10-06/B2106834_NguyenThanhHieu_Backend_1.git
a7f578c..5beb7f1 main -> main

D:\B2106834_NguyenThanhHieu_Backend_1>
```


1.4 BƯỚC 4: Cài Đặt Express

1.4.1 Cấu hình

app.js:

```
const express = require("express");
const cors = require("cors");
const app = express();

app.use(cors());
app.use(express.json());

app.get("/", (req, res) => {
  res.json({ message: "Welcome to book application!" });
});

module.exports = app; You, 1 second ago • Uncommitted changes
```

server.js:

```
const app = require("./app");
const config = require("./app/config");

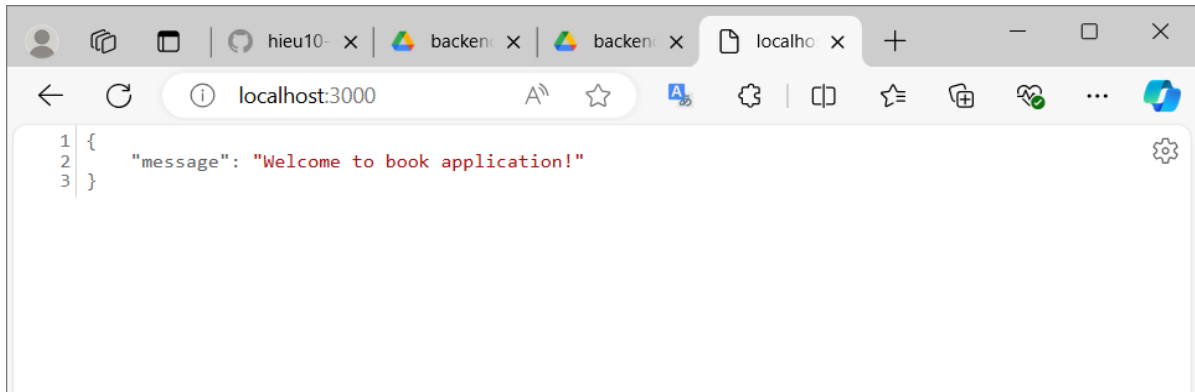
const PORT = config.app.port;
app.listen(PORT, () => {
  console.log(`server is running on port ${PORT}.`);
}); You, last month • Cai dat express chay thon bao
```

app/config/index.js:

```
app > config > JS index.js > [?] <unknown>
You, last month | 1 author (You)
1  const config = {
2      app: {
3          port: process.env.PORT || 3000,
4      }
5  };
6
7  module.exports = config;
You, last month
```

node server.js

```
C:\Windows\System32\cmd.exe - node server.js
D:\B2106834_NguyenThanhHieu_Backend_1>git add -u
warning: in the working copy of 'package-lock.json', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'package.json', LF will be replaced by CRLF the next time Git touches it
D:\B2106834_NguyenThanhHieu_Backend_1>git add .eslinttrc.js
D:\B2106834_NguyenThanhHieu_Backend_1>git commit -m "Cau hinh ESLint cho du an"
[main 5beb7f1] Cau hinh ESLint cho du an
3 files changed, 1474 insertions(+), 5 deletions(-)
create mode 100644 .eslinttrc.js
D:\B2106834_NguyenThanhHieu_Backend_1>git push
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 8 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 20.18 KiB | 10.09 MiB/s, done.
Total 5 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/hieu10-06/B2106834_NguyenThanhHieu_Backend_1.git
a7f578c..5beb7f1  main -> main
D:\B2106834_NguyenThanhHieu_Backend_1>node server.js
server is running on port 3000.
```



1.4.2 Cài đặt nodemon:

npm install nodemon --save-dev

```
"scripts": {  
  "start": "nodemon server.js"  
},
```

1.4.3 Lưu các thay đổi vào git:

```
C:\Windows\System32\cmd.exe  
D:\B2106834_NguyenThanhHieu_Backend_1>git add -u  
warning: in the working copy of 'package-lock.json', LF will be replaced by CRLF the next time Git touches it  
warning: in the working copy of 'package.json', LF will be replaced by CRLF the next time Git touches it  
D:\B2106834_NguyenThanhHieu_Backend_1>git add .  
D:\B2106834_NguyenThanhHieu_Backend_1>git commit -m "Cai dat express chay thon bao xin chao"  
[main c6c2a88] Cai dat express chay thon bao xin chao  
5 files changed, 330 insertions(+), 1 deletion(-)  
create mode 100644 app.js  
create mode 100644 app/config/index.js  
create mode 100644 server.js  
D:\B2106834_NguyenThanhHieu_Backend_1>git push  
Enumerating objects: 12, done.  
Counting objects: 100% (12/12), done.  
Delta compression using up to 8 threads  
Compressing objects: 100% (7/7), done.  
Writing objects: 100% (9/9), 3.91 KiB | 1.96 MiB/s, done.  
Total 9 (delta 2), reused 0 (delta 0), pack-reused 0  
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.  
To https://github.com/hieu10-06/B2106834_NguyenThanhHieu_Backend_1.git  
5beb7f1..c6c2a88  main -> main  
D:\B2106834_NguyenThanhHieu_Backend_1>
```

1.5 BƯỚC 5: định nghĩa Controller và các route

1.5.1 Cấu hình

tập tin contact.controller.js:

```
app > controllers > JS contact.controller.js > dele (parameter) res: any
You, last month | 1 author (You)
1 exports.create = (req, res) => {
2   res.send({ message: "create handler" });
3
4 };
5
6 exports.findAll = (req, res) => {
7   res.send({ message: "findAll handler" });
8 };
9
10 exports.findOne = (req, res) => {
11   res.send({ message: "findOne handler" });
12 };
13
14 exports.update = (req, res) => {
15   res.send({ message: "update handler" });
16 };
17
18 exports.delete = (req, res) => { You, last month
19   res.send({ message: "delete handler" });
20 };
21
22 exports.deleteAll = (req, res) => {
23   res.send({ message: "deleteAll handler" });
24 };
25 exports.findAllFavorite = (req, res) => {
26   res.send({ message: "findallFavorite handler" });
27 };
```

contact.route.js:

app > routes > JS contact.route.js > ...

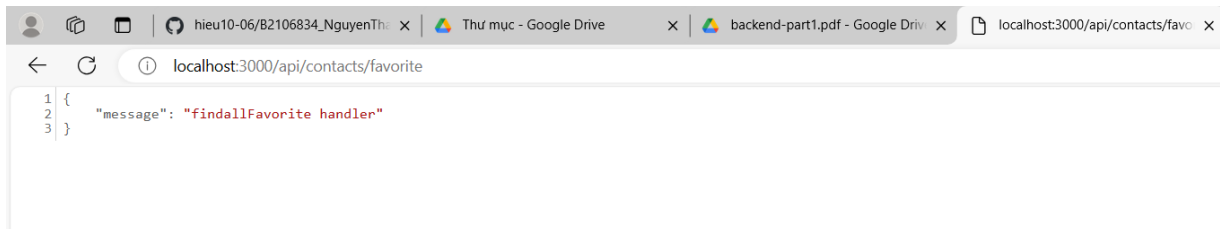
```
You, last month | 1 author (You)
1  const express = require("express");
2  const contacts = require("../controllers/contact.controller");
3
4  const router = express.Router();
5
6  router.route("/")
7    .get(contacts.findAll)
8    .post(contacts.create)
9    .delete(contacts.deleteAll);
10 router.route("/favorite")
11    .get(contacts.findAllFavorite);
12 router.route("/:id")
13    .get(contacts.findOne)
14    .put(contacts.update)
15    .delete(contacts.delete);
16
17 module.exports = router;
```

1.5.2 Hiệu chỉnh app.js:

```
const contactsRouter = require("./app/routes/contact.route");
app.use("/api/contacts", contactsRouter);

module.exports = app;
```

1.5.3 Yêu cầu GET đến URL: <http://localhost:3000/api/contact/favorite>



1.5.4 Lưu các thay đổi:

```
C:\Windows\System32\cmd.exe
server is running on port 3000.
[nodemon] starting `node server.js`
server is running on port 3000.
^CTerminate batch job (Y/N)? y

D:\B2106834_NguyenThanhHieu_Backend_1>git add .
warning: in the working copy of 'package.json', LF will be replaced by CRLF the next time Git touches it

D:\B2106834_NguyenThanhHieu_Backend_1>git commit -m "Định nghĩa các route cho tài nguyên của Contact"
[main 3464621] Định nghĩa các route cho tài nguyên của Contact
3 files changed, 46 insertions(+), 1 deletion(-)
create mode 100644 app/controllers/contact.controller.js
create mode 100644 app/routes/contact.route.js

D:\B2106834_NguyenThanhHieu_Backend_1>git push
Enumerating objects: 11, done.
Counting objects: 100% (11/11), done.
Delta compression using up to 8 threads
Compressing objects: 100% (6/6), done.
Writing objects: 100% (8/8), 985 bytes | 985.00 KiB/s, done.
Total 8 (delta 2), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To https://github.com/hieu10-06/B2106834_NguyenThanhHieu_Backend_1.git
c6c2a88..3464621 main -> main

D:\B2106834_NguyenThanhHieu_Backend_1>
```

1.6 BƯỚC 6: cài đặt xử lý lỗi

1.6.1 Cấu hình

tập tin app/api-error.js

```
app > JS api-error.js > ⚙️ ApiError > 📦 constructor
You, last month | 1 author (You)
1 class ApiError extends Error {
2   constructor(statusCode, message) {
3     super();
4     this.statusCode = statusCode;
5     this.message = message;
6   }
7 }
8 module.exports = ApiError;
```

cài các middleware trong app.js:

```

JS app.js > ...
You, 1 second ago | 1 author (You)
1 | const ApiError = require("../app/api-error");
2 |
3 | const express = require("express");
4 | const cors = require("cors");
5 | const app = express();
6 |
7 | app.use(cors());
8 | app.use(express.json());
9 |
10 | app.get("/", (req, res) => {
11 |     res.json({ message: "Welcome to book application!" });
12 | });
13 |
14 | const contactsRouter = require("../app/routes/contact.route");
15 | app.use("/api/contacts", contactsRouter);
16 |
17 | app.use((req, res, next) => {
18 |     return next(new ApiError(404, "Resource not found"));
19 | });
20 |
21 | app.use((err, req, res, next) => {
22 |     return res.status(err.statusCode || 500).json({
23 |         message: err.message || "Internal Server Error",
24 |     });
25 | });
26 | module.exports = app;
27 |

```

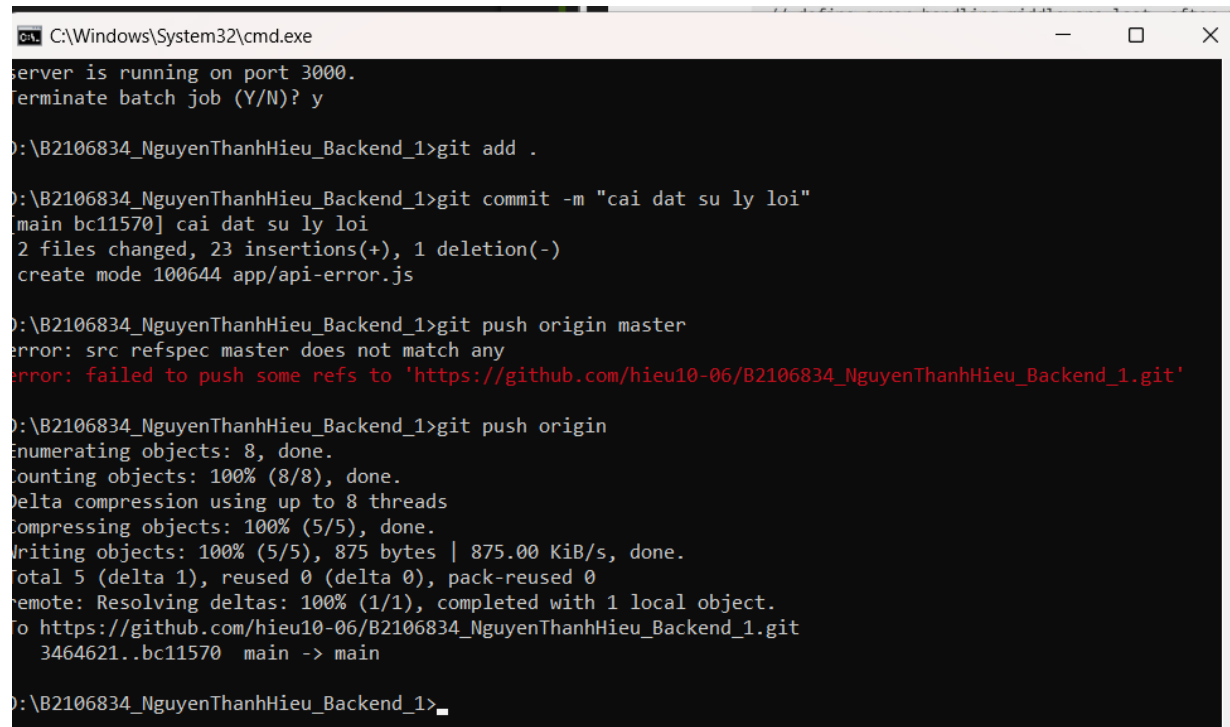
1.6.2 Kiểm tra:

The screenshot shows a web client interface with the following details:

- URL:** `http://localhost:3000/api/contacts/favorite`
- Method:** `POST`
- Status:** `404 Not Found` (10 ms, 306 B)
- Response Body:** `{"message": "Resource not found"}`

The interface includes tabs for Params, Auth, Headers (7), Body, Scripts, and Settings. The Body tab is currently selected, showing the response in a Pretty, Raw, Preview, or Visualize format. The response is displayed in the Pretty format.

1.6.3 Lưu các thay đổi:



```
C:\Windows\System32\cmd.exe
server is running on port 3000.
Terminate batch job (Y/N)? y

D:\B2106834_NguyenThanhHieu_Backend_1>git add .

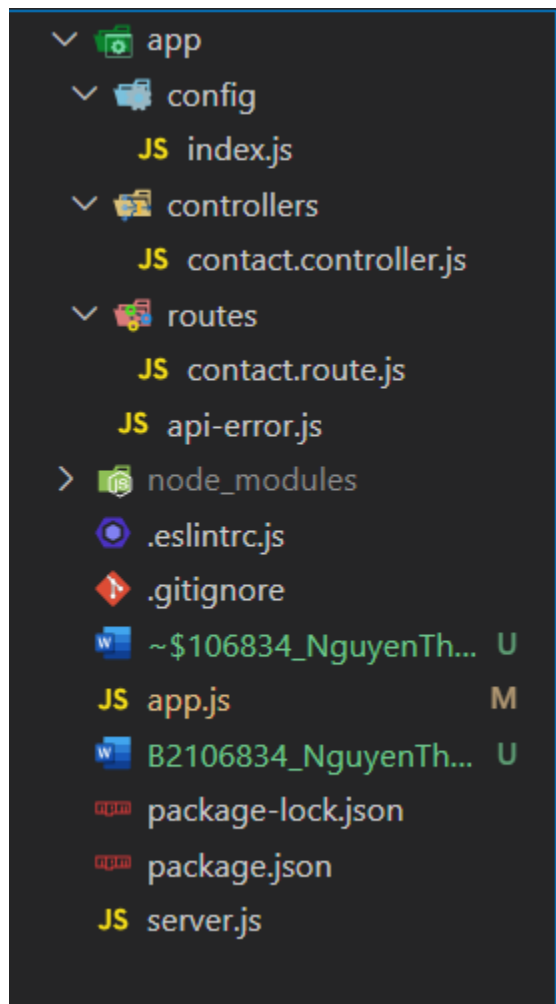
D:\B2106834_NguyenThanhHieu_Backend_1>git commit -m "cai dat su ly loi"
[main bc11570] cai dat su ly loi
 2 files changed, 23 insertions(+), 1 deletion(-)
 create mode 100644 app/api-error.js

D:\B2106834_NguyenThanhHieu_Backend_1>git push origin master
error: src refspec master does not match any
error: failed to push some refs to 'https://github.com/hieu10-06/B2106834_NguyenThanhHieu_Backend_1.git'

D:\B2106834_NguyenThanhHieu_Backend_1>git push origin
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 8 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 875 bytes | 875.00 KiB/s, done.
Total 5 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/hieu10-06/B2106834_NguyenThanhHieu_Backend_1.git
 3464621..bc11570  main -> main

D:\B2106834_NguyenThanhHieu_Backend_1>
```


1.7 Cấu trúc cây thư mục dự án:



1.8 Link Github của dự án backend 1

[hieu10-06/B2106834_NguyenThanhHieu_Backend_1 \(github.com\)](https://github.com/hieu10-06/B2106834_NguyenThanhHieu_Backend_1)

2. THỰC HÀNH 2: BACKEND 2

2.1 Cài đặt thư viện MongoDB, định nghĩa hàm trợ giúp kết nối và lớp dịch vụ truy xuất CSDL

2.1.1 Cài đặt thư viện MongoDB

npm install mongodb

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  GITLENS  COMMENTS

PS D:\B2106834_NguyenThanhHieu_Backend_2> npm install mongodb

added 11 packages, and audited 213 packages in 3s

46 packages are looking for funding
  run `npm fund` for details

5 vulnerabilities (2 moderate, 3 high)

To address all issues, run:
  npm audit fix

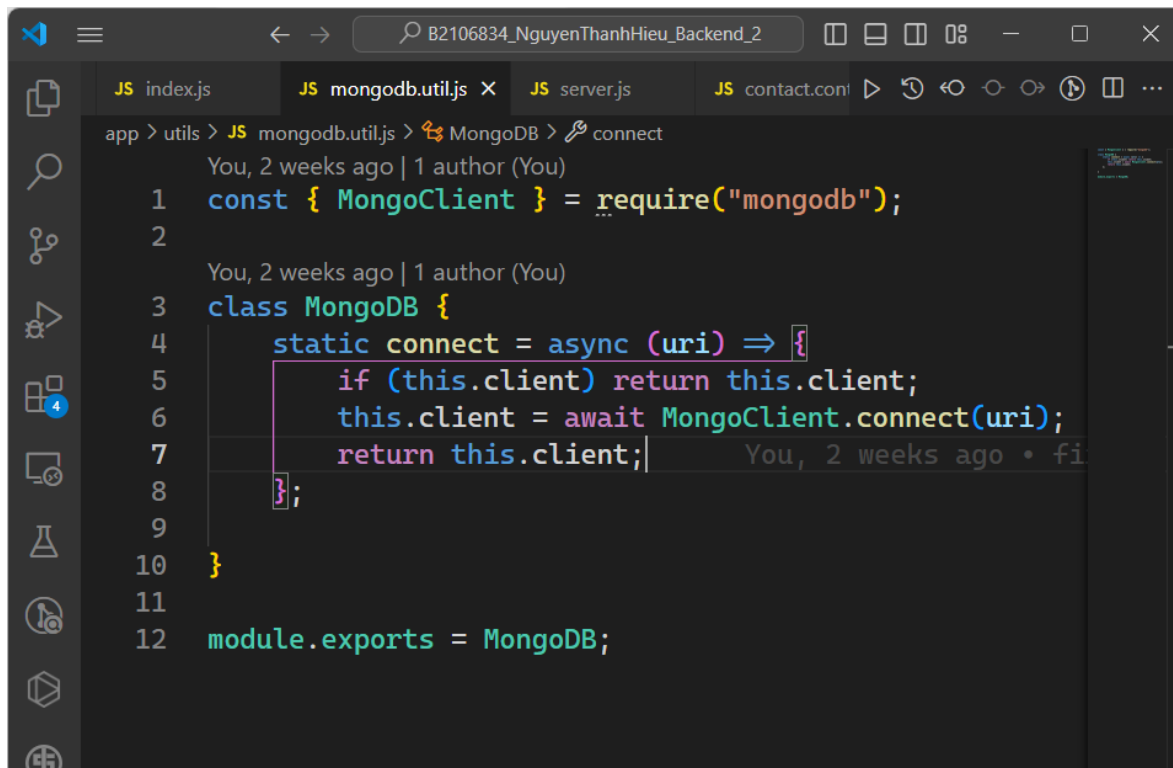
Run `npm audit` for details.
PS D:\B2106834_NguyenThanhHieu_Backend_2> █
```

2.1.2 Định nghĩa hàm trợ giúp kết nối và lớp dịch vụ truy xuất CSDL

2.1.2.1 Index.js

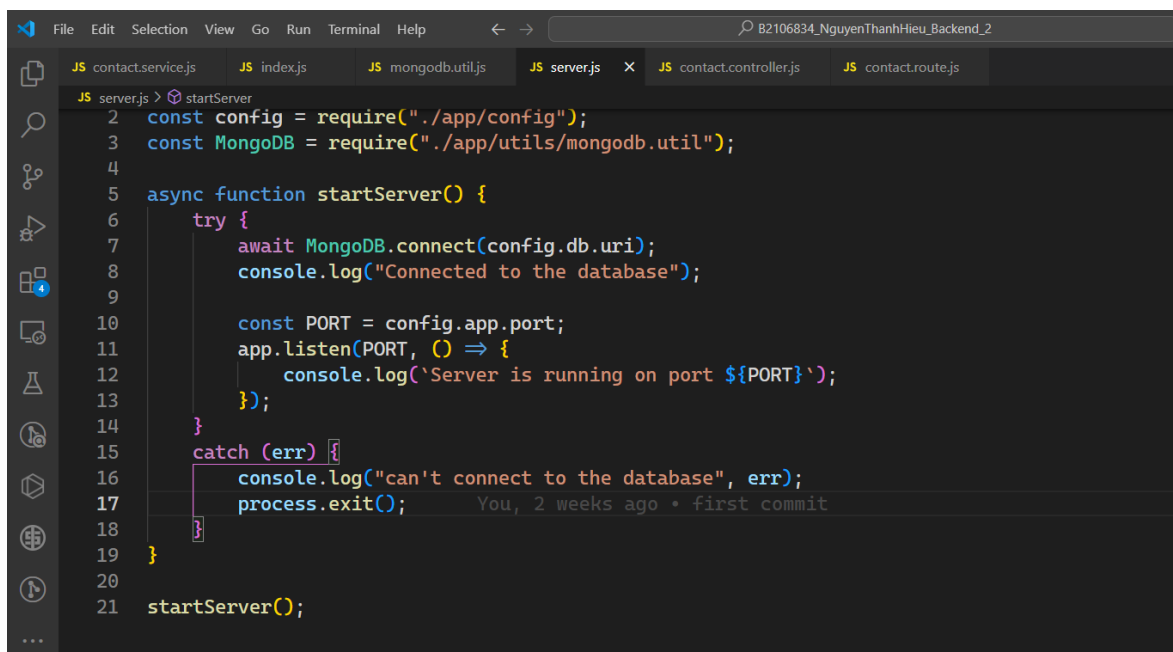
```
app > config > JS index.js > ...
You, 1 second ago | 1 author (You)
1  const config = {
2    app: {
3      port: process.env.PORT || 3000,
4    },
5  },
6  db: {
7    uri: process.env.MONGODB_URI || "mongodb://localhost:27017/ContactBook"
8  }
9  };
10 module.exports = config; AbortController.call(this); You, 2 weeks ago • first commit
```

2.1.2.2 Mongodb.util.js



```
app > utils > JS mongodb.util.js > MongoDB > connect
You, 2 weeks ago | 1 author (You)
1  const { MongoClient } = require("mongodb");
2
3  You, 2 weeks ago | 1 author (You)
4  class MongoDB {
5      static connect = async (uri) => {
6          if (this.client) return this.client;
7          this.client = await MongoClient.connect(uri);
8          return this.client;
9      };
10 }
11
12 module.exports = MongoDB;
```

2.1.2.3 Server.js



```
JS server.js > startServer
2  const config = require("../app/config");
3  const MongoDB = require("../app/utils/mongodb.util");
4
5  async function startServer() {
6      try {
7          await MongoDB.connect(config.db.uri);
8          console.log("Connected to the database");
9
10         const PORT = config.app.port;
11         app.listen(PORT, () => {
12             console.log(`Server is running on port ${PORT}`);
13         });
14     }
15     catch (err) {
16         console.log("can't connect to the database", err);
17         process.exit();
18     }
19 }
20
21 startServer();
```

2.1.2.4 Contact.service.js

2.2 Cài đặt các handler

2.2.1 Cài đặt handler create

2.2.1.1 Contact.controller.js

2.2.1.2 Contact.service.js

```
app > services > JS contact.service.js > ContactService > create
3  class ContactService {
8    extractContactData(payload) {
9      const contact = {
10        name: payload.name,
11        email: payload.email,
12        address: payload.address,
13        phone: payload.phone,
14        favorite: payload.favorite,
15      };
16      Object.keys(contact).forEach(
17        (key) => contact[key] === undefined && delete contact[key]
18      );
19      return contact;
20    }
21    async create(payload) {
22      const contact = this.extractContactData(payload);
23      const result = await this.Contact.findOneAndUpdate(
24        contact,
25        {
26          $set: { favorite: contact.favorite === true },
27        },
28        {
29          returnDocument: "after", upsert: true
30        }
31      );
32      return result;
33    }
  }
```

2.2.1.3 Kiểm tra với Postman

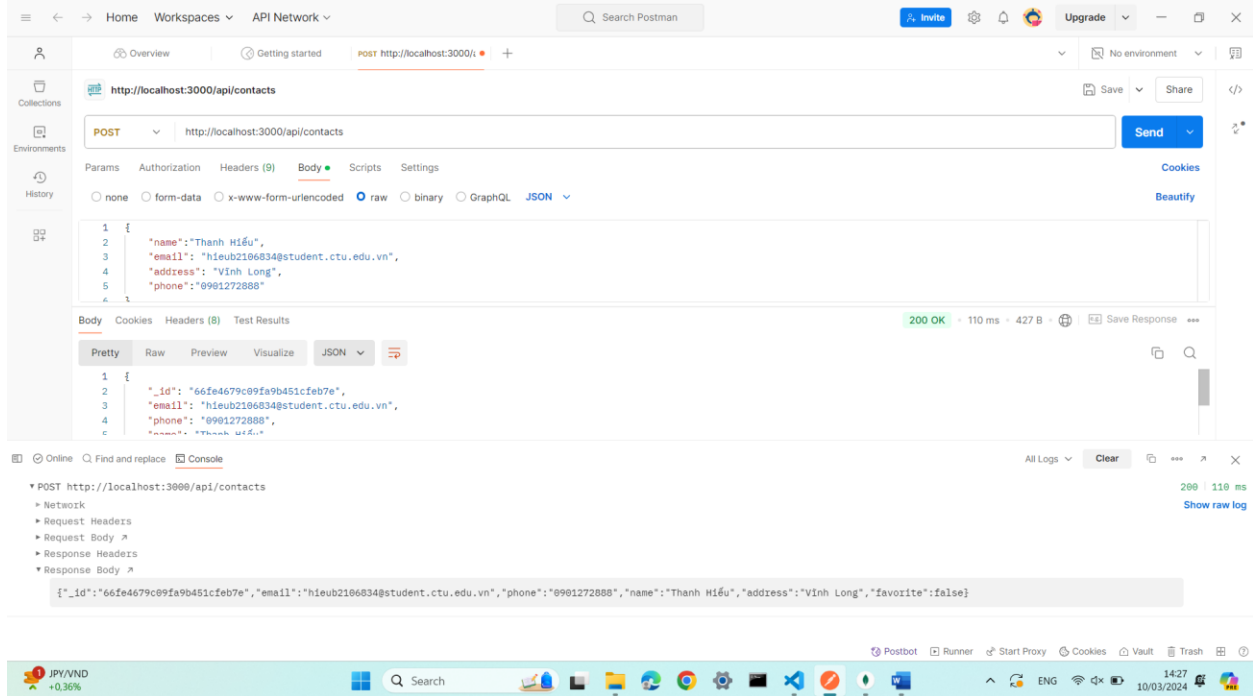
The image displays two screenshots of the Postman application interface, illustrating the setup for a POST request.

Top Screenshot: The interface shows a POST request to `http://localhost:3000/api/contacts`. The **Headers** tab is selected, showing 8 headers (7 hidden). The **Content-Type** header is set to `application/json`. The **Response** section is empty, displaying a rocket launch illustration.

Bottom Screenshot: The interface shows the same POST request, but the **Body** tab is selected. The body is set to **raw** with a **JSON** format. The JSON payload is:

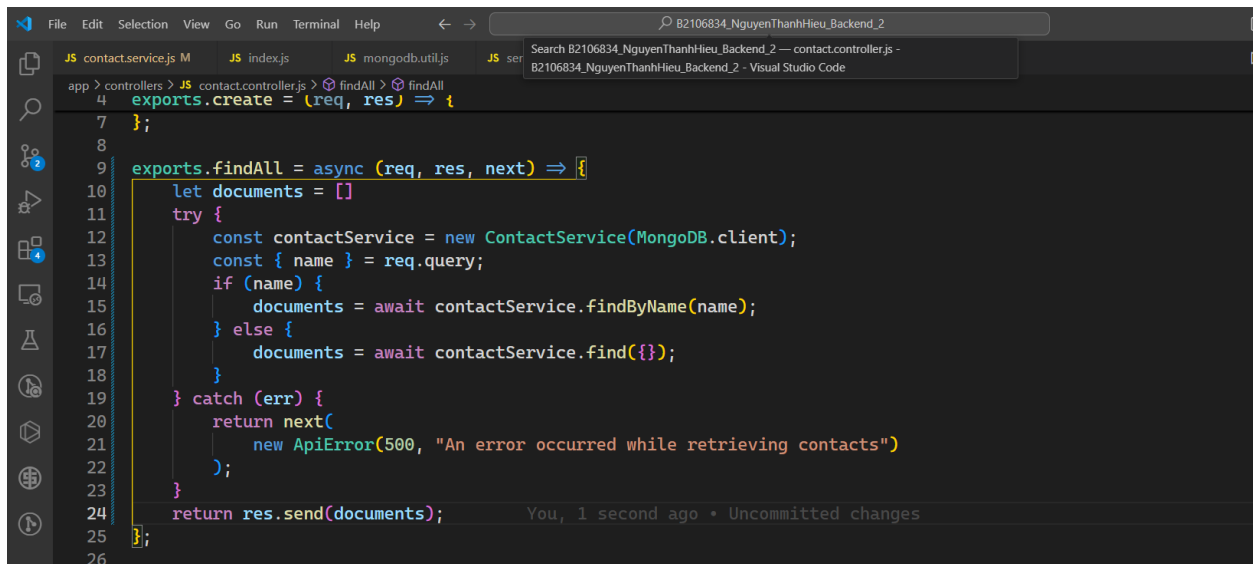
```
1 {
2   "name": "Thanh-Hiếu",
3   "email": "hieub2106834@student.ctu.edu.vn",
4   "address": "Vinh Long",
5   "phone": "0909091112"
6 }
```

The **Response** section is also visible at the bottom of the interface.



2.2.2 Cài đặt handler *findAll*

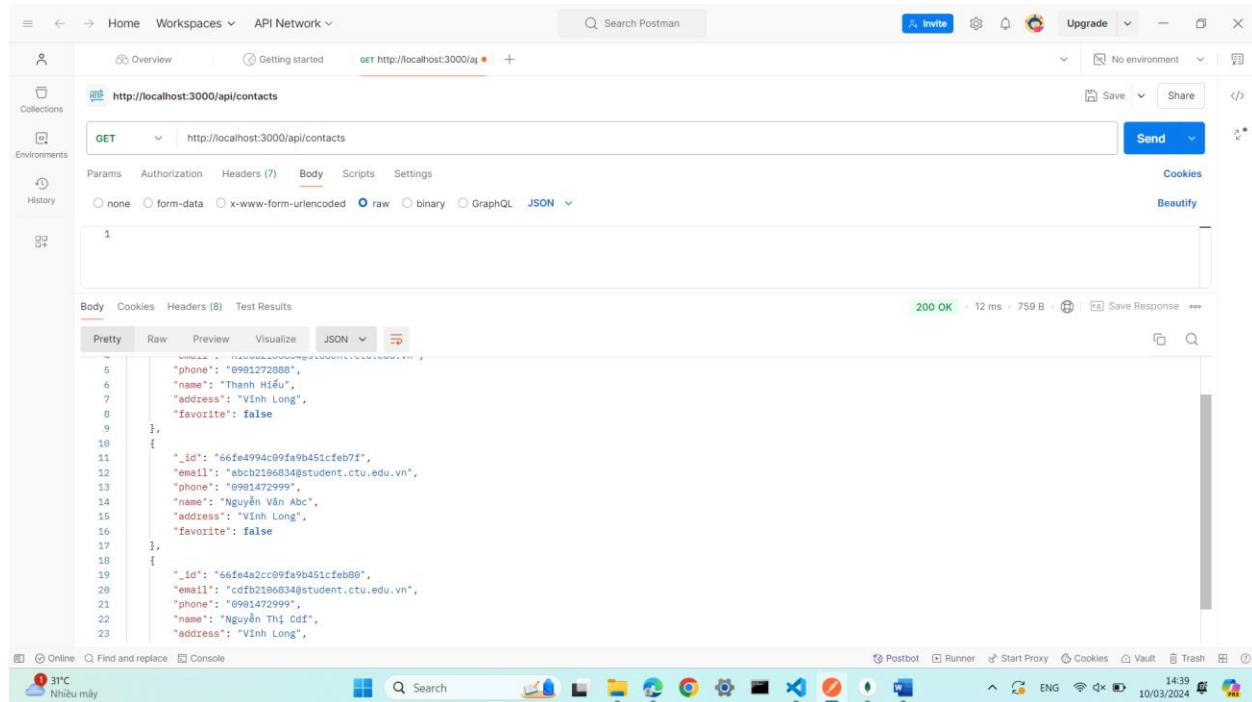
2.2.2.1 *Contact.controller.js*



2.2.2.2 *Contact.service.js*

```
run Terminal Help ← → B2106834_NguyenThanhHieu_Backend_2
JS contact.service.js M X JS index.js JS mongodb.util.js JS server.js JS contact.controller.js 2, M JS contact.route.js
app > services > JS contact.service.js > ContactService > extractContactData
3 class ContactService {
39
40   async find(filter) {
41     const cursor = await this.Contact.find(filter);
42     return await cursor.toArray();
43   }
44   async findByName(name) {
45     return await this.find({
46       name: { $regex: new RegExp(new RegExp(name)), $options: "i" },
47     });
48   }
49 }
50 module.exports = ContactService;
```

2.2.2.3 Kiểm tra với Postman



2.2.3 Cài đặt findOne

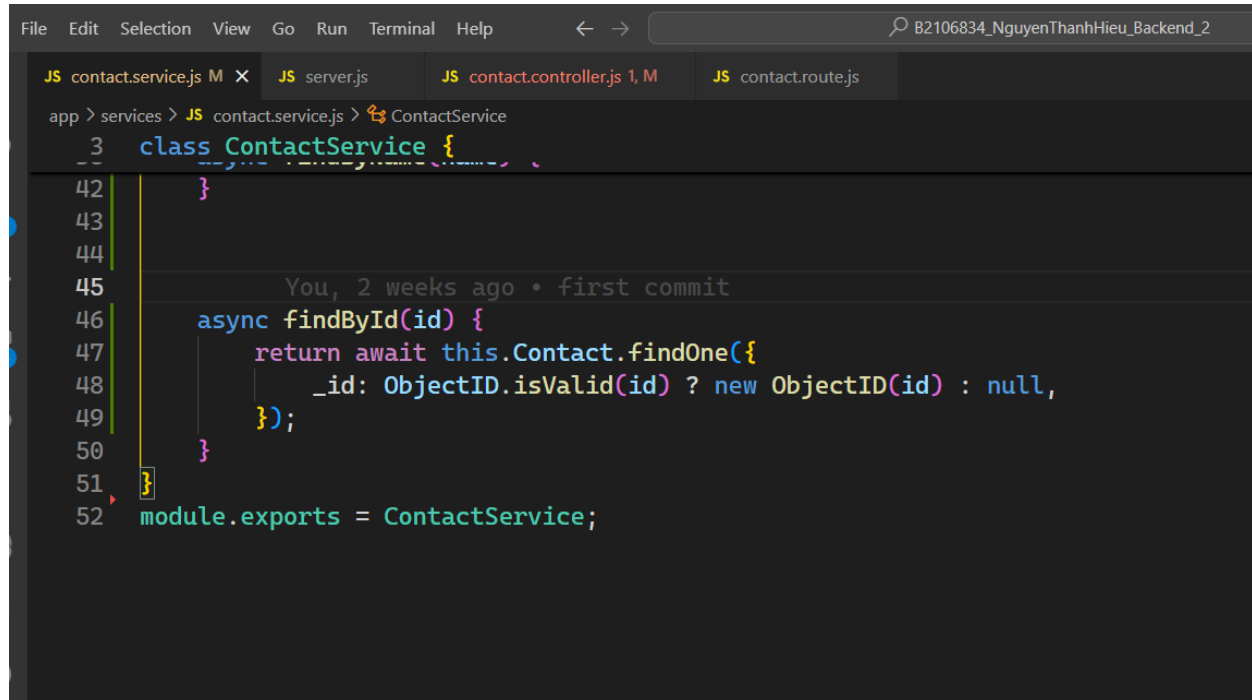
2.2.3.1 Contact.controller.js


```

39
40 exports.findOne = async (req, res, next) => {
41   try {
42     const contactService = new ContactService(MongoDB.client);
43     const document = await contactService.findById(req.params.id);
44     console.log(req.params.id);
45     if (!document) {
46       return next(new ApiError(404, "Contact not found"));
47     }
48     return res.send(document);
49   } catch (err) {
50     return next(
51       new ApiError(500, `Error retrieving contact with id ${req.params.id}`)
52     );
53   }
54 };
55

```

2.2.3.2 *Contact.service.js*

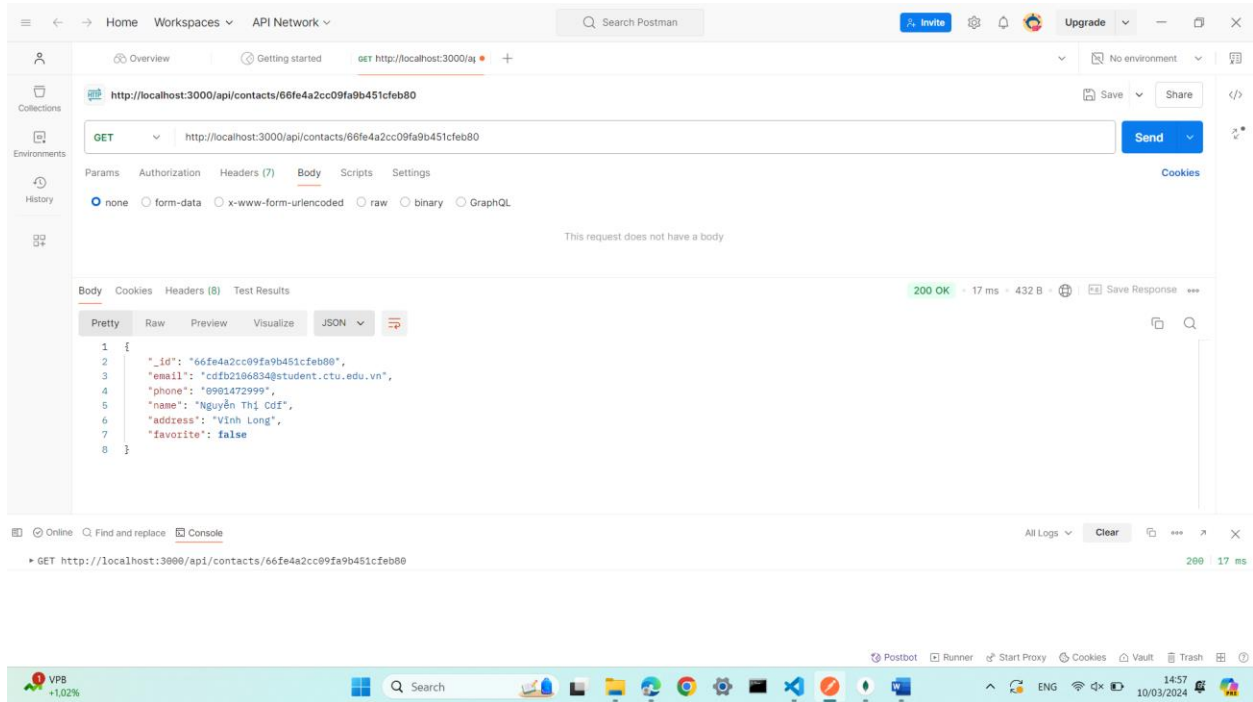


```

File Edit Selection View Go Run Terminal Help
JS contact.service.js M X JS server.js JS contact.controller.js 1, M JS contact.route.js
app > services > JS contact.service.js > ContactService
3 class ContactService {
42   }
43
44
45   You, 2 weeks ago • first commit
46   async findById(id) {
47     return await this.Contact.findOne({
48       _id: ObjectID.isValid(id) ? new ObjectID(id) : null,
49     });
50   }
51 }
52 module.exports = ContactService;

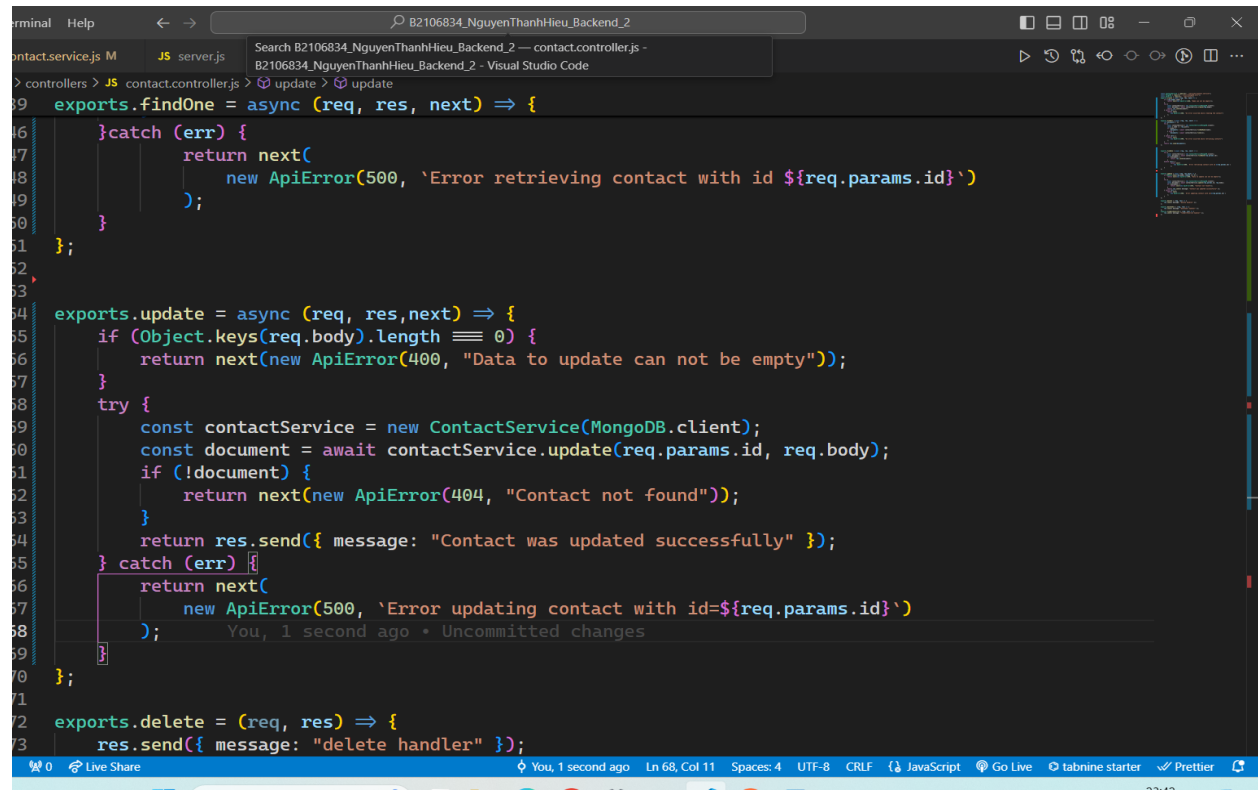
```

2.2.3.3 Kiểm tra với Postman



2.2.4 Cài đặt handler update

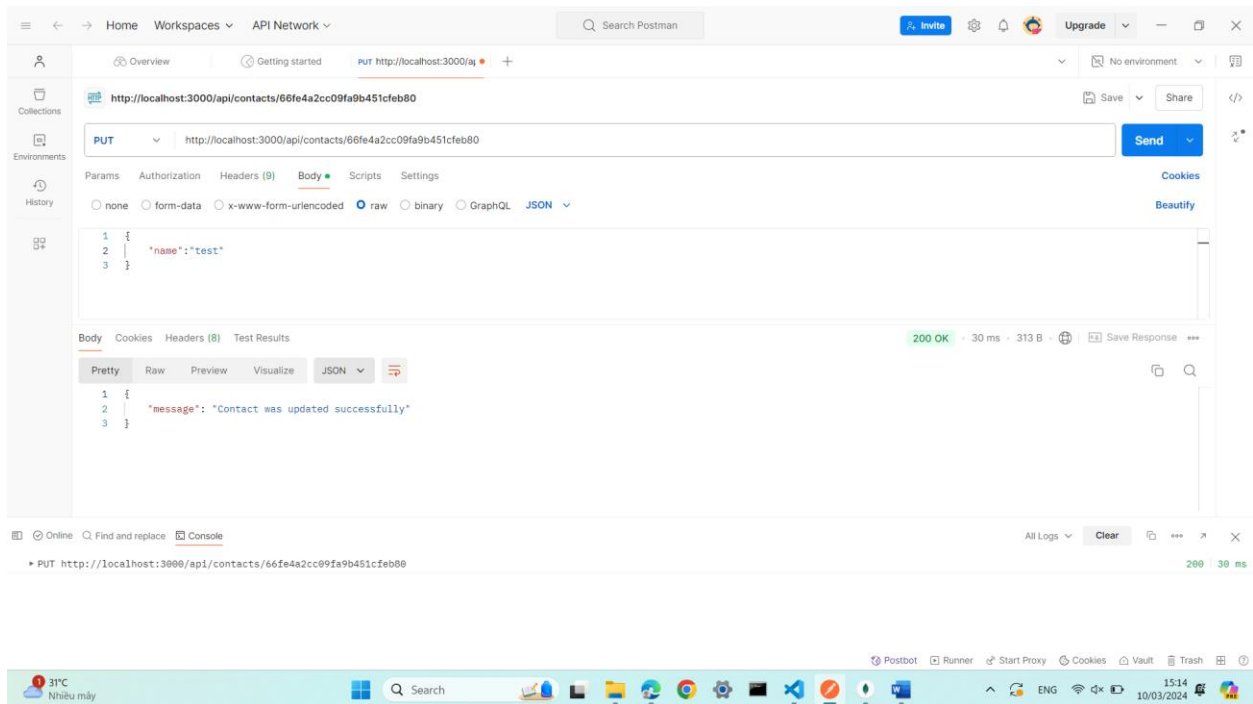
2.2.4.1 Contact.controller.js



2.2.4.2 Contact.service.js

```
49   async update(id, payload) {
50     const filter = {
51       _id: ObjectId.isValid(id) ? new ObjectId(id) : null,
52     };
53     const update = this.extractContactData(payload);
54     const result = await this.Contact.findOneAndUpdate(
55       filter,
56       { $set: update },
57       { returnDocument: "after" }
58     );
59     return result;
60   }
61 }
```

2.2.4.3 Kiểm tra với Postman



2.2.5 Cài đặt handler delete

2.2.5.1 Contact.controller.js

```

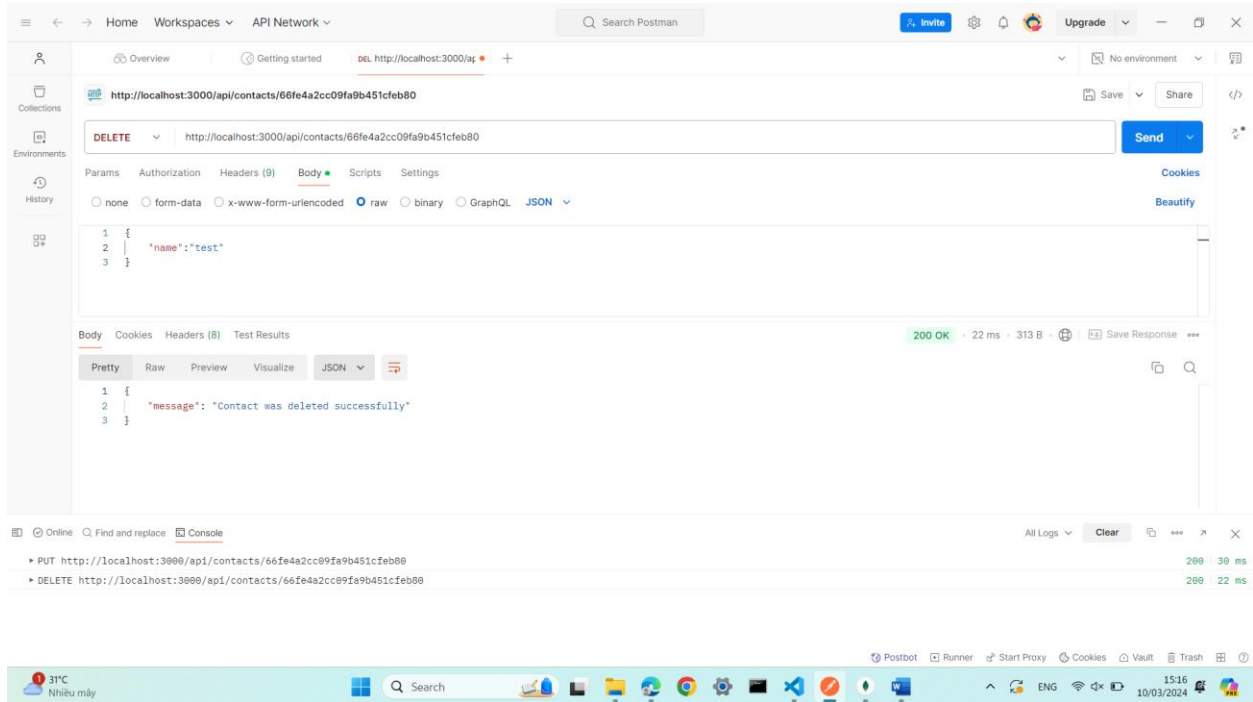
71
72 exports.delete = async (req, res, next) => {
73   try {
74     const contactService = new ContactService(MongoDB.client);
75     const document = await contactService.delete(req.params.id);
76     if (!document) {
77       return next(new ApiError(404, "Contact not found"));
78     }
79     return res.send({ message: "Contact was deleted successfully" });
80   } catch (err) {
81     return next(
82       new ApiError(500, `Could not delete contact with id = ${req.params.id}`)
83     );
84   }
85 };
86
87
88
89
```

2.2.5.2 Contact.service.js

```

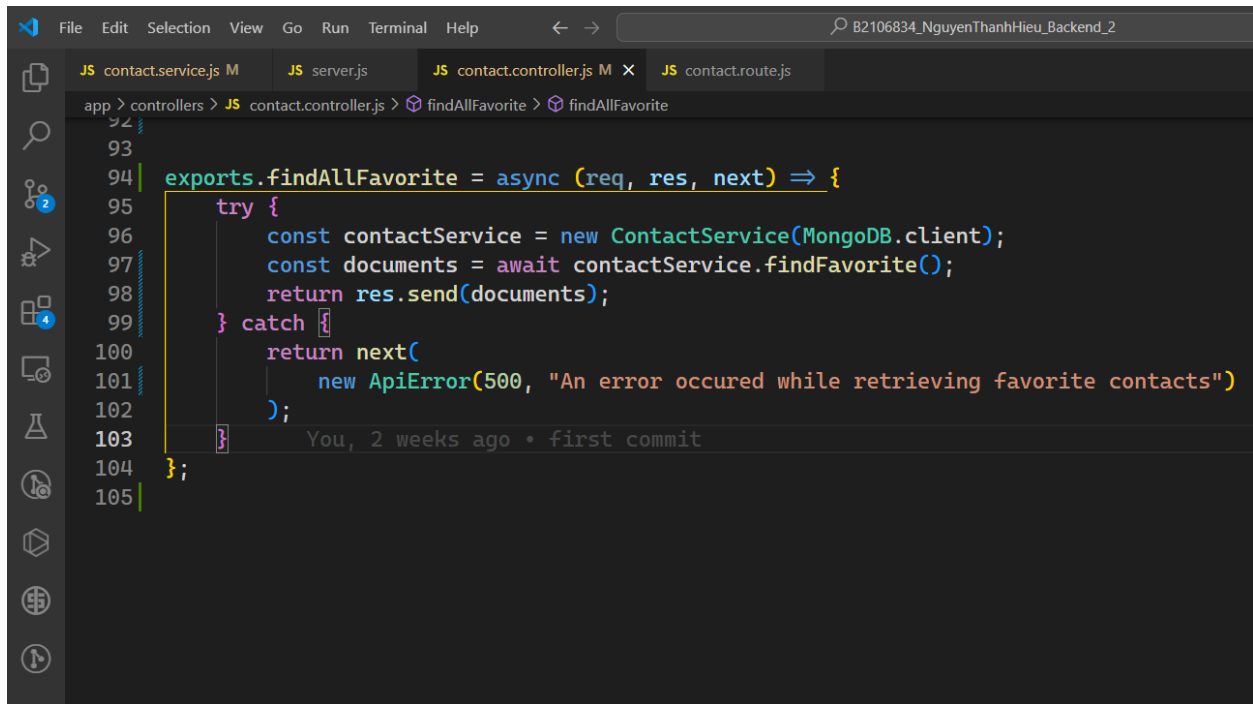
3 class ContactService {
61
62   async delete(id) {
63     const result = await this.Contact.findOneAndDelete({
64       _id: ObjectID.isValid(id) ? new ObjectID(id) : null,
65     });
66     return result;
67   }
68 }
69 module.exports = ContactService;
```

2.2.5.3 Kiểm tra với Postman



2.2.6 Cài đặt handler `findAllFavorite`

2.2.6.1 `Contact.controller.js`



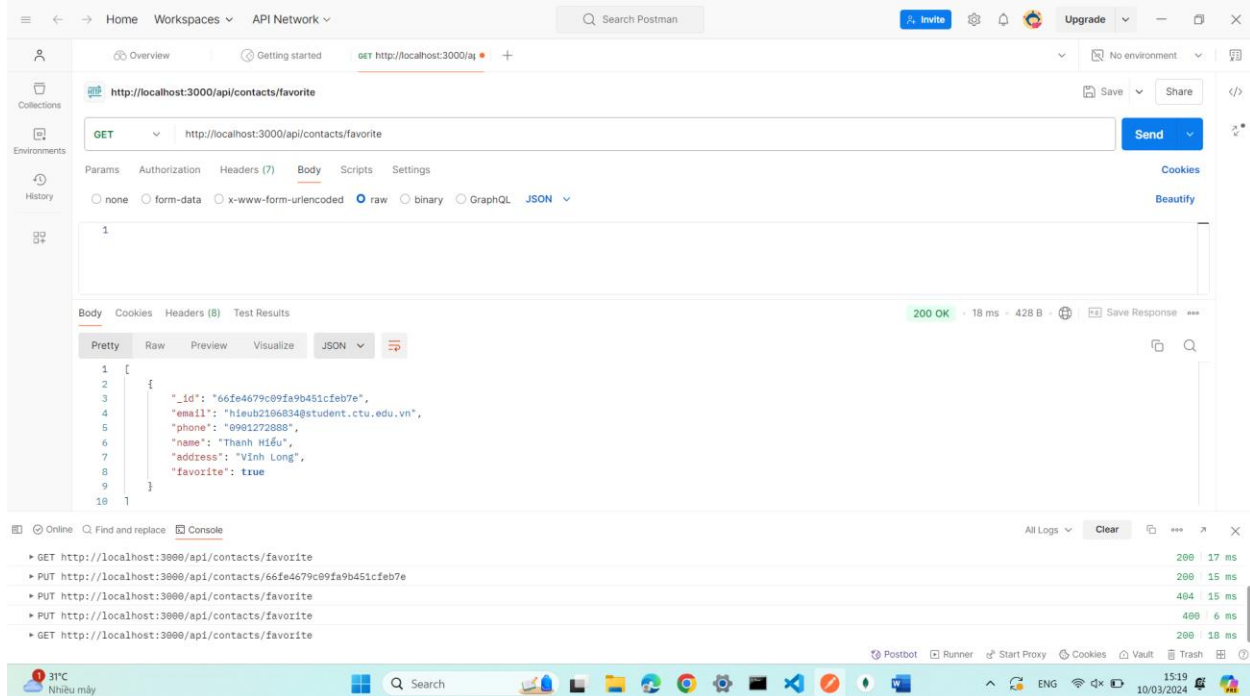
2.2.6.2 `Contact.service.js`

```

69   async findFavorite() {
70       return await this.find({favorite: true});
71   }
72

```

2.2.6.3 Kiểm tra với Postman



2.2.7 Cài đặt handler `deleteAll`

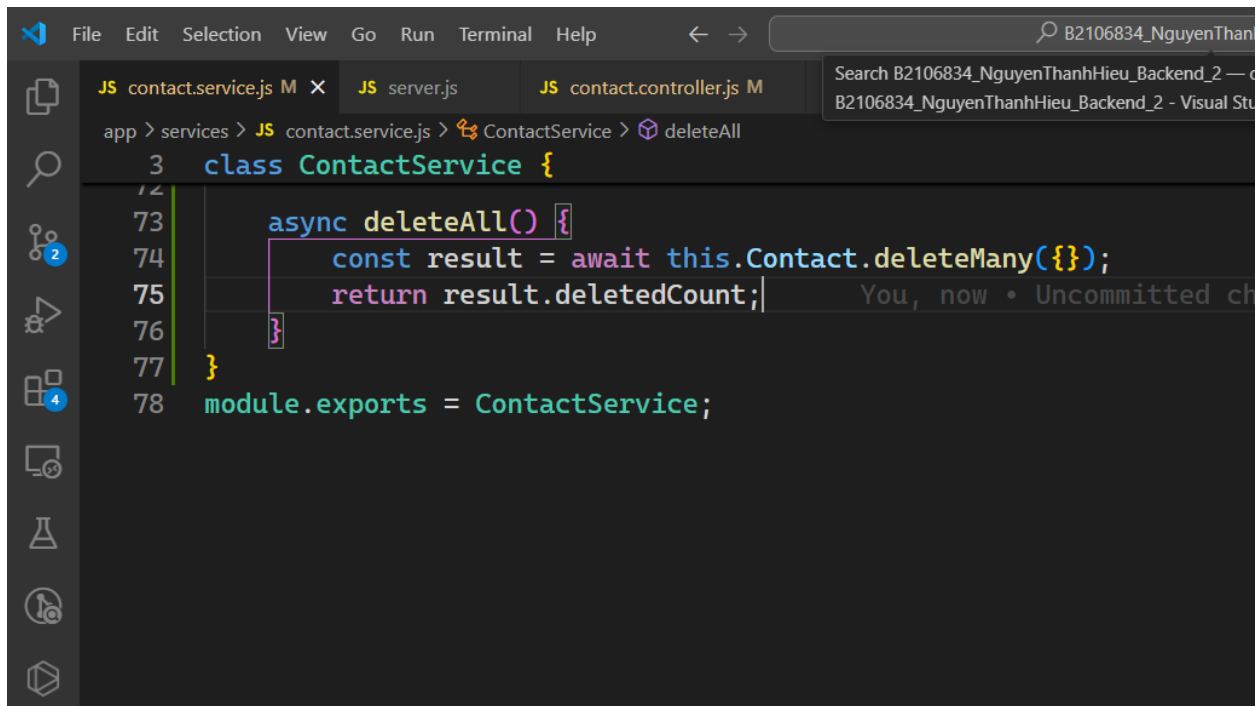
2.2.7.1 `Contact.controller.js`

```

86
87
88   exports.deleteAll = async (req, res, next) => {
89       try {
90           const contactService = new ContactService(MongoDB.client);
91           const deleteCount = await contactService.deleteAll();
92           return res.send({
93               message: `${deleteCount} contacts were deleted successfully`,
94           });
95       } catch {
96           return next(
97               new ApiError(500, "An error occurred while removing favorite contacts")
98           );
99       }
100   };
101
102

```

2.2.7.2 Contact.service.js



The screenshot shows the Visual Studio Code editor with the file `contact.service.js` open. The code defines a `ContactService` class with an `deleteAll()` method. The breadcrumb navigation at the top indicates the path: `app > services > JS contact.service.js > ContactService > deleteAll`. The code is as follows:

```
3 class ContactService {
12
73   async deleteAll() {
74     const result = await this.Contact.deleteMany({});
75     return result.deletedCount;
76   }
77 }
78 module.exports = ContactService;
```

2.2.7.3 Kiểm tra với Postman

