

LAPORAN UJIAN AKHIR SEMESTER

PENGEMBANGAN BACKEND



Dosen Pengampu :

M. Taufiq M.Kom

Disusun Oleh :

Amanda Melda Savitri / 3124101291

Putri Sahma Dewi / 3124101293

PRODI D3 MANAJEMEN INFORMATIKA

STIKOM PGRI BANYUWANGI

TAHUN 2025

1. npm init -y

```
Microsoft Windows [Version 10.0.22631.5624]
(c) Microsoft Corporation. All rights reserved.

C:\Users\lenovo\OneDrive\Documents\Semester 2\Pengembangan Backend\UASBackend>npm init -y
Wrote to C:\Users\lenovo\OneDrive\Documents\Semester 2\Pengembangan Backend\UASBackend\package.json:

{
  "name": "uasbackend",
  "version": "1.0.0",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "description": ""
}
```

Penjelasan : Perintah ini digunakan untuk inisialisasi sebuah proyek Node.js dengan membuat file package.json secara otomatis.

2. npm install

```
C:\Users\lenovo\OneDrive\Documents\Semester 2\Pengembangan Backend\UASBackend>npm install

up to date, audited 1 package in 2s

found 0 vulnerabilities
```

Penjelasan : Perintah ini digunakan untuk menginstal semua library atau package yang tercantum dalam file package.json.

3. npm install bcrypt bcryptjs cookie-parser dotenv express express-validator helmet jsonwebtoken mysql2 sequelize

```
C:\Users\lenovo\OneDrive\Documents\Semester 2\Pengembangan Backend\UASBackend>npm install bcrypt bcryptjs cookie-parser dotenv express express-validator helmet jsonwebtoken mysql2 sequelize

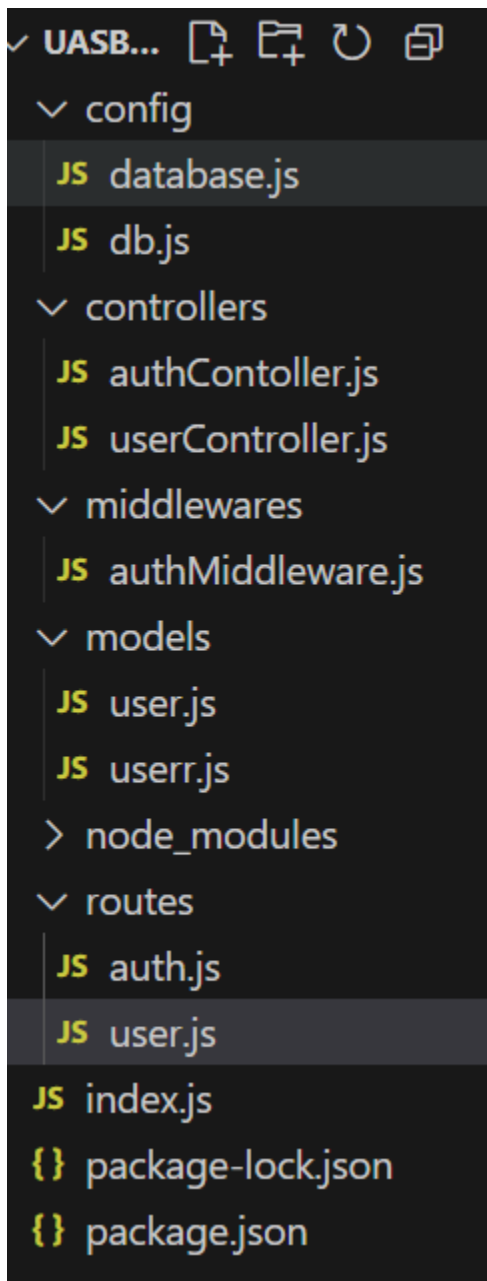
added 118 packages, and audited 119 packages in 34s

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

found 0 vulnerabilities
```

Perintah ini digunakan untuk menginstal package yang dibutuhkan dalam pengembangan backend

4. Membuat folder dan isi masing – masing folder



5. Membuat isi file **database.js** pada folder config

```

const { Sequelize } = require('sequelize');
// require('dotenv').config();

✓ const sequelize = new Sequelize('userstopupstreaming', 'root', '', {
  host: 'localhost',
  dialect: 'mysql',
  port: 3306,
});
💡
module.exports = { sequelize};

```

6. Membuat isi file **db.js** pada folder config

```

const { Sequelize } = require('sequelize');

const sequelize = new Sequelize('userstopupstreaming', 'root', '', {
  host: 'localhost',
  dialect: 'mysql',
});

module.exports = { sequelize};

```

7. Membuat isi file **authController.js** pada folder controllers

```

const bcrypt = require('bcrypt');
const jwt = require('jsonwebtoken');
const { validationResult } = require('express-validator');
const User = require('../models/user');

Windsurf: Refactor | Explain | Generate JSDoc | ✕
exports.register = async (req, res) => {
  const errors = validationResult(req);
  if (!errors.isEmpty()) return res.status(400).
    json({ errors: errors.array() });

  const { email, password, role } = req.body;
  const hashedPassword = await bcrypt.hash(password, 10);
  try {
    const user = await User.
      create({ email, password: hashedPassword, role: role || 'user' });
    res.status(201).json({ message: 'User created', user });
  } catch (err) {
    res.status(400).json({ message: err.message });
  }
};

Windsurf: Refactor | Explain | Generate JSDoc | ✕
exports.login = async (req, res) => {
  const errors = validationResult(req);
  if (!errors.isEmpty()) return res.status(400).
    json({ errors: errors.array() });

  const { email, password } = req.body;
  const user = await User.findOne({ where: { email } });
  if (!user || !await bcrypt.compare(password, user.password)) {
    return res.status(401).json({ message: 'Invalid credentials' });
  }

  const token = jwt.sign({ id: user.id, role: user.role },
    'SECRET_KEY', { expiresIn: '1h' });
  res.cookie('token', token, { httpOnly: true });
  json({ message: 'Login successful' });
};

Windsurf: Refactor | Explain | Generate JSDoc | ✕
exports.logout = (req, res) => {
  res.clearCookie('token').json({ message: 'Logged out' });
};

```

8. Membuat isi file **UserController.js** pada folder controller

```

const express = require('express');
const router = express.Router();
const User = require('../models/userrr');

// GET semua user
router.get('/', async (req, res) => {
  const user = await User.findAll();
  res.json(user);
});

// GET user by ID
router.get('/:id', async (req, res) => {
  const { id } = req.params;
  const user = await User.findByPk(id);
  if (user) {
    res.json(user);
  } else {
    res.status(404).json({ message: 'User not found' });
  }
});

// POST tambah user
router.post('/', async (req, res) => {
  const { email, password, role } = req.body;
  try {
    const newUser = await User.create({ email, password, role });
    res.status(201).json(newUser);
  } catch (error) {
    res.status(400).json({ error: error.message });
  }
});

// PUT update User
router.put('/:id', async (req, res) => {
  const { id } = req.params;
  const { email, password, role } = req.body;
  try {
    const update = await User.update(
      { email, password, role },
      { where: { id } }
    );
    res.json({ message: 'User updated', update });
  } catch (error) {
    res.status(400).json({ error: error.message });
  }
});

// DELETE User
router.delete('/:id', async (req, res) => {
  const { id } = req.params;
  try {
    await User.destroy({ where: { id } });
    res.json({ message: 'User deleted' });
  } catch (error) {
    res.status(400).json({ error: error.message });
  }
});

module.exports = router;

```

9. Membuat isi file **authMiddleware.js** pada folder **middlewares**

```
const jwt = require('jsonwebtoken');

Windsurf: Refactor | Explain | Generate JSDoc | X
exports.protect = (req, res, next) => {
  const token = req.cookies.token;
  if (!token) return res.status(401).json({ message: 'Unauthorized' });

  try {
    const user = jwt.verify(token, 'SECRET_KEY');
    req.user = user;
    next();
  } catch (err) {
    res.status(401).json({ message: 'Invalid token' });
  }
};

Windsurf: Refactor | Explain | Generate JSDoc | X
exports.adminOnly = (req, res, next) => {
  if (req.user.role !== 'admin') return res.status(403).
  json({ message: 'Forbidden' });
  next();
};
```

10. Membuat isi file **user.js** pada folder models

```
const { DataTypes } = require('sequelize');
const { sequelize } = require('../config/db');

const User = sequelize.define('User', {
  email: {
    type: DataTypes.STRING,
    unique: true,
    allowNull: false,
  },
  password: {
    type: DataTypes.STRING,
    allowNull: false,
  },
  role: {
    type: DataTypes.STRING,
    defaultValue: 'user',
  },
});
module.exports = User;
```

11. Membuat isi file **userr.js** pada folder models

```

const { DataTypes } = require('sequelize');
const { sequelize } = require('../config/database');

const User = sequelize.define('User', {
  email: {
    type: DataTypes.STRING,
    unique: true,
    allowNull: false,
  },
  password: {
    type: DataTypes.STRING,
    allowNull: false,
  },
  role: {
    type: DataTypes.STRING,
    defaultValue: 'user',
  },
}, {
  tableName: 'users',
  timestamps: false,
});
module.exports = User;

```

12. Membuat isi file **auth.js** pada folder routes

```

const express = require('express');
const { body } = require('express-validator');
const router = express.Router();
const { register, login, logout } =
  require('../controllers/authController');
const { protect, adminOnly } =
  require('../middlewares/authMiddleware');

router.post('/register',
  body('email').isEmail(),
  body('password').isLength({ min: 6 }),
  register
);

router.post('/login',
  body('email').isEmail(),
  body('password').notEmpty(),
  login
);

router.post('/logout', logout);

router.get('/admin', protect, adminOnly, (req, res) => {
  res.json({ message: 'Welcome Admin!' });
});

module.exports = router;

```

13. Membuat isi file **user.js** pada folder routes


```
const express = require("express");
const router = express.Router();
const userController = require("../controllers/userController");

router.get("/", userController.get);
router.get("/:id", userController.get);
router.post("/", userController.post);
router.put("/:id", userController.put);
router.delete("/:id", userController.delete);

module.exports = router;
```

14. Membuat isi file **index.js**

```
const express = require("express");
const cookieParser = require("cookie-parser");
const helmet = require("helmet");
const { sequelize } = require("../config/db");
const authRoutes = require("../routes/auth");
const userRouter = require("../controllers/userController");

const app = express();
app.use(express.json());
app.use(cookieParser());
app.use(helmet());

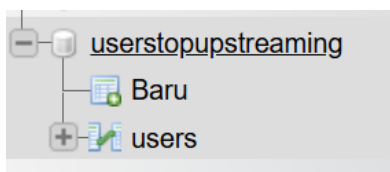
app.use("/api/user", userRouter);

app.use("/api/auth", authRoutes);
sequelize.sync().then(() => console.log("Database synced"));
app.listen(3000, () => console.log("Server running on http://localhost:3000));
```

15. Membuat database di **MySQL**

```
1 CREATE DATABASE usersTopUpStreaming;
```

Tampilan :



16. Node index.js

```
C:\Users\lenovo\OneDrive\Documents\Semester 2\Pengembangan Backend\16bcak>node index.js
Server running on http://localhost:3000
Executing (default): SELECT TABLE_NAME FROM INFORMATION_SCHEMA.TABLES WHERE TABLE_TYPE = 'BASE TABLE' AND TABLE_NAME = 'Users' AND TABLE_SCHEMA = 'userstopupstreaming'
Executing (default): CREATE TABLE IF NOT EXISTS `Users` (`id` INTEGER NOT NULL auto_increment , `email` VARCHAR(255) NOT NULL UNIQUE, `password` VARCHAR(255) NOT NULL, `role` VARCHAR(255) DEFAULT 'user', `createdAt` DATETIME NOT NULL, `updatedAt` DATETIME NOT NULL, PRIMARY KEY (`id`)) ENGINE=InnoDB;
Executing (default): SHOW INDEX FROM `Users`
Database synced
```

Penjelasan : Perintah ini digunakan untuk menjalankan file utama (index.js) dari server Express. File ini berfungsi sebagai entry point yang menginisialisasi server, middleware, dan koneksi ke database. Setelah dijalankan, server akan aktif dan siap menerima permintaan dari client.

17. Tampilan MySQL setelah terhubung dengan project

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra	Tindakan
<input type="checkbox"/> 1	id 🔑	int(11)			Tidak	Tidak ada		AUTO_INCREMENT	Ubah Hapus Lainnya
<input type="checkbox"/> 2	email 📧	varchar(255)	utf8mb4_general_ci		Tidak	Tidak ada			Ubah Hapus Lainnya
<input type="checkbox"/> 3	password	varchar(255)	utf8mb4_general_ci		Tidak	Tidak ada			Ubah Hapus Lainnya
<input type="checkbox"/> 4	role	varchar(255)	utf8mb4_general_ci		Ya	user			Ubah Hapus Lainnya
<input type="checkbox"/> 5	createdAt	datetime			Tidak	Tidak ada			Ubah Hapus Lainnya
<input type="checkbox"/> 6	updatedAt	datetime			Tidak	Tidak ada			Ubah Hapus Lainnya

18. Ujicoba di postman : Registrasi admin

POST http://localhost:3000/api/auth/register

Params Authorization Headers (8) Body Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary JSON

```

1 {
2   "email": "nordcurrent96@gmail.com",
3   "password": "nordnord",
4   "role": "admin"
5 }

```

ody Cookies Headers (18) Test Results 201 Created 313 ms 1

Pretty Raw Preview Visualize JSON

```

1 {
2   "message": "User created",
3   "user": {
4     "id": 4,
5     "email": "planechef77@gmail.com",
6     "password": "$2b$10$dB1BJBmr/8KXN4XMh1UNn0.1XJqknvdYE3BgDJF3Nfin16fnjE/Ca",
7     "role": "admin",
8     "updatedAt": "2025-07-13T09:33:54.324Z",
9     "createdAt": "2025-07-13T09:33:54.324Z"
10  }
11 }

```

19. Ujicoba di postman : Registrasi user

POST http://localhost:3000/api/auth/register

Params Authorization Headers (8) Body Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary JSON

```

1 {
2   "email": "putrisahma266@gmail.com",
3   "password": "shmaa2121",
4   "role": "user"
5 }

```

ody Cookies Headers (18) Test Results 201 Created 313 ms 1

Pretty Raw Preview Visualize JSON

```

1 {
2   "message": "User created",
3   "user": {
4     "id": 4,
5     "email": "planechef77@gmail.com",
6     "password": "$2b$10$dB1BJBmr/8KXN4XMh1UNn0.1XJqknvdYE3BgDJF3Nfin16fnjE/Ca",
7     "role": "admin",
8     "updatedAt": "2025-07-13T09:33:54.324Z",
9     "createdAt": "2025-07-13T09:33:54.324Z"
10  }
11 }

```

20. Tampilan di MySQL

☐ Tampilkan semua

Jumlah baris: 25

Saring baris: Cari di tabel ini

Sort by key: Tidak ada

Extra options

←

T

→

▼

id

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

✎

Salin

✖

Hapus

21. Ujicoba di postman : Admin login “Login juga berlaku bagi user”

POST

http://localhost:3000/api/auth/login

Params

Authorization

Headers (9)

Body ●

Pre

● none

● form-data

● x-www-form-urlencoded

●

```

1  {
2    "email" : "planechef77@gmail.com",
3    "password" : "airplanechef"
4  }

```

body

Cookies (1)

Headers (19)

Test Results

Pretty

Raw

Preview

Visualize

JSON

```

1  {
2    "message": "Login successful"
3  }

```

22. Ujicoba di postman : Logout

POST

⌵

http://localhost:3000/api/auth/logout

ParamsAuthorizationHeaders (8)Body ●Pr

☐ none

☐ form-data

☐ x-www-form-urlencoded

☐

1

{

2

"email" : "amandamelda17@gmail.com",

3

"password" : "melsaaa"

4

}

BodyCookiesHeaders (19)Test Results

Pretty

Raw

Preview

Visualize

JSON

1

{

2

"message": "Logged out"

3

}

23. Welcome admin

GET

⌵

http://localhost:3000/api/auth/admin

ParamsAuthorizationHeaders (9)Body ●Pre

● none

● form-data

● x-www-form-urlencoded

●

1

{

2

"email" : "planechef77@gmail.com",

3

"password" : "airplanechef"

4

}

BodyCookies (1)Headers (18)Test Results

Pretty

Raw

Preview

Visualize

JSON ⌵

1

{

2

"message": "Welcome Admin!"

3

}

24. Proseses **CRUD** : GET

GET http://localhost:3000/api/user Send

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary JSON Beautify

```
1 {
2   "email": "putrisahma266@gmail.com",
3   "password": "shmaa2121",
4   "role": "user"
5 }
```

Body Cookies Headers (18) Test Results 200 OK 226 ms 1.32 KB Save Response

Pretty Raw Preview Visualize JSON

```
1 [
2   {
3     "id": 1,
4     "email": "putrisahma266@gmail.com",
5     "password": "$2b$10$pWsodkwdq1Y470L6zU4KZ04Pk3T0/sppaNuc0iyywEhBL1XeIo8Cu",
6     "role": "user"
7   },
8   {
9     "id": 2,
```

25. Proseses CRUD : POST

POST http://localhost:3000/api/user Send

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary JSON Beautify

```
1 {
2   "email": "sahmadewi12@gmail.com",
3   "password": "samasama",
4   "role": "admin"
5 }
```

Body Cookies Headers (18) Test Results 201 Created 122 ms 957 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2   "id": 5,
3   "email": "sahmadewi12@gmail.com",
4   "password": "samasama",
5   "role": "admin"
6 }
```

26. Proseses CRUD : PUT

PUT http://localhost:3000/api/user/5 Send

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary JSON Beautify

```
1 {
2   "email": "sahmadewi12@gmail.com",
3   "password": "salmonaraaaa",
4   "role": "admin"
5 }
```

ody Cookies Headers (18) Test Results 200 OK 63 ms 914 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2   "message": "User updated",
3   "update": [
4     1
5   ]
6 }
```

27. Proses CRUD : DELETE

DELETE http://localhost:3000/api/user/4 Send

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary JSON Beautify

```
1 {
2   "email": "sahmadewi12@gmail.com",
3   "password": "salmonaraaaa",
4   "role": "admin"
5 }
```

Body Cookies Headers (18) Test Results 200 OK 21 ms 1.45 KB Save Response

Pretty Raw Preview Visualize JSON

```
18   "role": "admin"
19 },
20 {
21   "id": 4,
22   "email": "planechef77@gmail.com",
23   "password": "$2b$10$dB1BJBmr/8KXN4XMh1UNn0.1XJqknvdYE3BgDJF3Nfin16finjE/Ca",
24   "role": "admin"
25 },
26 {
```

Tampilan setelah di delete :

DELETE

http://localhost:3000/api/user/4

Send

Params Authorization Headers (8) **Body** Pre-request Script Tests Settings

☐ none ☐ form-data ☐ x-www-form-urlencoded ☒ raw ☐ binary JSON

Cookies

Beautify

```
1 {
2   "email": "sahmadewi12@gmail.com",
3   "password": "salmonaaaaa",
4   "role": "admin"
5 }
```

Body Cookies Headers (18) Test Results

200 OK 137 ms 901 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2   "message": "User deleted"
3 }
```

GET

http://localhost:3000/api/user

Send

Params Authorization Headers (8) **Body** Pre-request Script Tests Settings

☐ none ☐ form-data ☐ x-www-form-urlencoded ☒ raw ☐ binary JSON

Cookies

Beautify

```
1 {
2   "email": "sahmadewi12@gmail.com",
3   "password": "salmonaaaaa",
4   "role": "admin"
5 }
```

Body Cookies Headers (18) Test Results

200 OK 569 ms 1.32 KB Save Response

Pretty Raw Preview Visualize JSON

```
15 {
16   "id": 3,
17   "email": "nordcurrent96@gmail.com",
18   "password": "$2b$10$h4frfmJmY5A1G3RtA8wUg0xoo0X9KEZYTZ.YIZW2k5qhpZz15oDw.",
19   "role": "admin"
20 },
21 {
22   "id": 5,
23   "email": "sahmadewi12@gmail.com",
24   "password": "salmonaaaaa",
25   "role": "admin"
26 }
```

Link github : <https://github.com/putrisyk888/pengembangan-backend/tree/main/Pertemuan%2016>