

Practice 2 - Backend

Title: JWT Authentication for Secure Banking API Endpoints

Objective:

Learn how to implement secure authentication in an Express.js application using JSON Web Tokens (JWT). This task helps you understand how to generate tokens, verify them in middleware, and protect sensitive API routes to ensure only authorized users can access banking operations.

Concept Overview:

JWT (JSON Web Token) is a compact and self-contained way for securely transmitting information between a client and server. Tokens are signed using a secret key and can be verified to ensure authenticity. Middleware is used to protect routes that should only be accessed by authenticated users.

Steps / Procedure:

Step 1: Initialize Project

```
mkdir jwt-banking-api
cd jwt-banking-api
npm init -y
npm install express jsonwebtoken body-parser
```

Step 2: Create server.js

```
const express = require('express');
const jwt = require('jsonwebtoken');
const bodyParser = require('body-parser');
const app = express();
const PORT = 3000;

app.use(bodyParser.json());

const USER = { username: 'user1', password: 'password123' };
const SECRET_KEY = 'myjwtsecret';
let balance = 1000;

app.post('/login', (req, res) => {
  const { username, password } = req.body;
  if (username === USER.username && password === USER.password) {
    const token = jwt.sign({ username }, SECRET_KEY, { expiresIn: '1h' });
    res.json({ token });
  } else {
    res.status(401).json({ message: 'Invalid credentials' });
  }
});

function verifyToken(req, res, next) {
  const authHeader = req.headers['authorization'];
  if (!authHeader) return res.status(403).json({ message: 'Token missing' });

  const token = authHeader.split(' ')[1];
  jwt.verify(token, SECRET_KEY, (err, decoded) => {
    if (err) return res.status(403).json({ message: 'Invalid or expired token' });
    req.user = decoded;
  });
  next();
}
```

```

        next();
    });
}

app.get('/balance', verifyToken, (req, res) => res.json({ balance }));

app.post('/deposit', verifyToken, (req, res) => {
    const { amount } = req.body;
    balance += amount;
    res.json({ message: `Deposited ${amount}`, newBalance: balance });
});

app.post('/withdraw', verifyToken, (req, res) => {
    const { amount } = req.body;
    if (amount > balance) return res.status(400).json({ message: 'Insufficient funds' });
    balance -= amount;
    res.json({ message: `Withdrew ${amount}`, newBalance: balance });
});

app.listen(PORT, () => console.log(`Server running on http://localhost:${PORT}`));

```

Step 3: Run the Server

node server.js

Step 4: Test the API using Postman or curl

- 1■■ Login (POST /login)
- 2■■ Access /balance without token
- 3■■ Access /balance with valid token
- 4■■ Deposit money
- 5■■ Withdraw money

Expected Output:

Expected Output

```
POST : http://localhost:3000/login Send

Body :
1 {
2   "username": "user1",
3   "password": "password123"
4 }
5

Request POST Response 200
> HTTP/1.1 200 OK (6 headers)
1 {
2   "token":
3     "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ1c2VybmFtZSI6InVzZXIiLCJleHAiOiJESNTIiXNTM3NTZ9.CsXXcld9xj74eEhtzJ-FiFgn60xfD4wll1iGX_rCfR9Q"
4 }
```

```
GET : http://localhost:3000/balance Send

Body :

Request GET Response 403
> HTTP/1.1 403 Forbidden (6 headers)
1 {
2   "message": "Invalid or expired token"
3 }
```

```
GET : http://localhost:3000/balance Send

Auth :
eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ1c2VybmFtZSI6InVzZXIiLCJleHAiOiJESNTIiXNTM3NTZ9.CsXXcld9xj74eEhtzJ-FiFgn60xfD4wll1iGX_rCfR9Q

Request GET Response 200
> HTTP/1.1 200 OK (6 headers)
1 {
2   "balance": 1000
3 }
```

```
POST : http://localhost:3000/deposit Send

Body :
1 {
2   "amount": 250
3 }
4

Request POST Response 200
> HTTP/1.1 200 OK (6 headers)
1 {
2   "message": "Deposited $250",
3   "newBalance": 1250
4 }
```

```
POST : http://localhost:3000/withdraw Send

Body :
1 {
2   "amount": 150
3 }
4

Request POST Response 200
> HTTP/1.1 200 OK (6 headers)
1 {
2   "message": "Withdraw $150",
3   "newBalance": 1100
4 }
```

Result:

- JWT successfully secures API routes.
- Unauthorized requests are blocked.
- Users can deposit and withdraw money only after authentication.
- Token verification ensures secure access to banking data.