Mutation testing - OTPController

Testing framework: Mocha@10.8.2
Assertion library used: Chai@4.3.4
Other: Sinon@19.0.2

Dependencies:
chai, sinon, bcrypt, nodemailer, googleapis, dotenv

Mocks/Stubs:
Google OAuth2: Mocked using sinon.stub for the OAuth2 client to simulate interaction with the Google API.
Nodemailer: Stubs createTransport method to simulate sending emails.
bcrypt: Stubs the hash and compare methods to simulate password hashing and OTP comparison.
OTPverification: Stubbed methods like find and deleteMany to simulate database interaction.
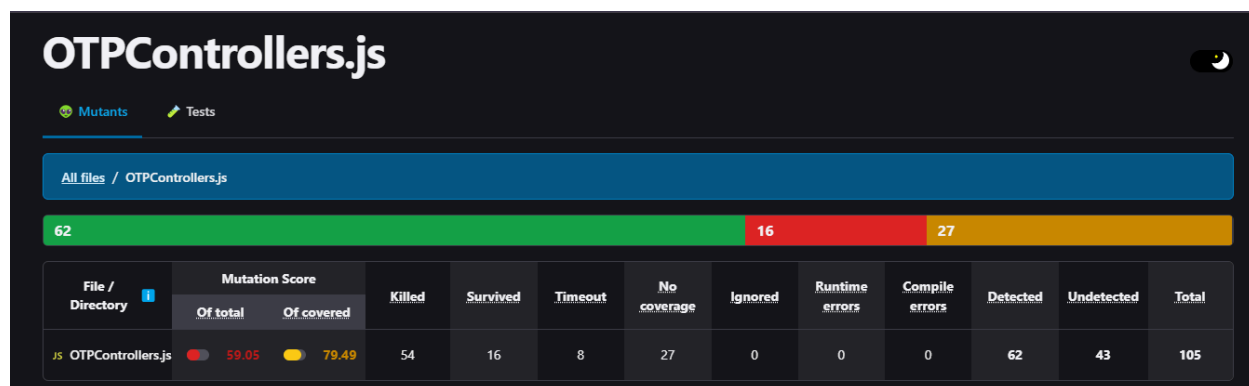loginschema: Stubs database updateOne method to simulate user updates.

Test Scope:
Covers core functionalities of OTP creation, sending OTP emails, OTP validation, and OTP resend operations.

Below is the result obtained by running the test file on the mutated code:

```
Ran 0.82 tests per mutant on average.
-------------------|------------------|----------|-----------|------------|----------|----------|
                   | % Mutation score |          |           |            |          |          |
File               |  total | covered | # killed | # timeout | # survived | # no cov | # errors |
-------------------|--------|---------|----------|-----------|------------|----------|----------|
All files          |  59.05 |   79.49 |       54 |         8 |         16 |       27 |        0 |
 OTPControllers.js |  59.05 |   79.49 |       54 |         8 |         16 |       27 |        0 |
-------------------|--------|---------|----------|-----------|------------|----------|----------|
```

OTPControllers.js

Mutants   Tests

All files / OTPControllers.js

| 62 | 16 | 27 |

File / Directory	Mutation Score		Killed	Survived	Timeout	No coverage	Ignored	Runtime errors	Compile errors	Detected	Undetected	Total
	Of total	Of covered										
JS OTPControllers.js	59.05	79.49	54	16	8	27	0	0	0	62	43	105

Arithmetic mutant

```
54  -        const otp = `${Math.floor(Math.random() * 9000 + 1000)}` //create 4 digit OTP ● ● ●
    +        const otp = `${Math.floor(Math.random() / 9000 + 1000)}` //create 4 digit OTP
```

👾 ArithmeticOperator Survived (54:35)   🔺 More

☂ Covered by 1 test (yet still survived)

Empty value

```
58  -            subject: "Verify Your HappyTails account", ●
    +            subject: "",
```

👾 StringLiteral Survived (58:22)   🔺 More

☂ Covered by 1 test (yet still survived)

Changing the condition

```
102  -        if(!email || !OTP) { ●
     +        if(!email && !OTP) {
```

👾 LogicalOperator Survived (102:12)   🔺 More

☂ Covered by 6 tests (yet still survived)

Changing the condition to true

```
139  -        if(!user) { ●
     +        if(true) {
```

👾 ConditionalExpression Survived (139:12)   🔺 More

☂ Covered by 1 test (yet still survived)

Links to files:

OTPControllers.js

OTPControllerTest.js