

Mutation testing - FormController

Testing framework: Mocha@10.8.2

Assertion library used: Chai@4.3.4

Other: Sinon@19.0.2

Scope of Testing: The test cases are designed to validate the functionality of the following methods in the formControllers module:

- submitForm
- getForm
- getFormMiddleware
- updateStatus

Test Coverage:

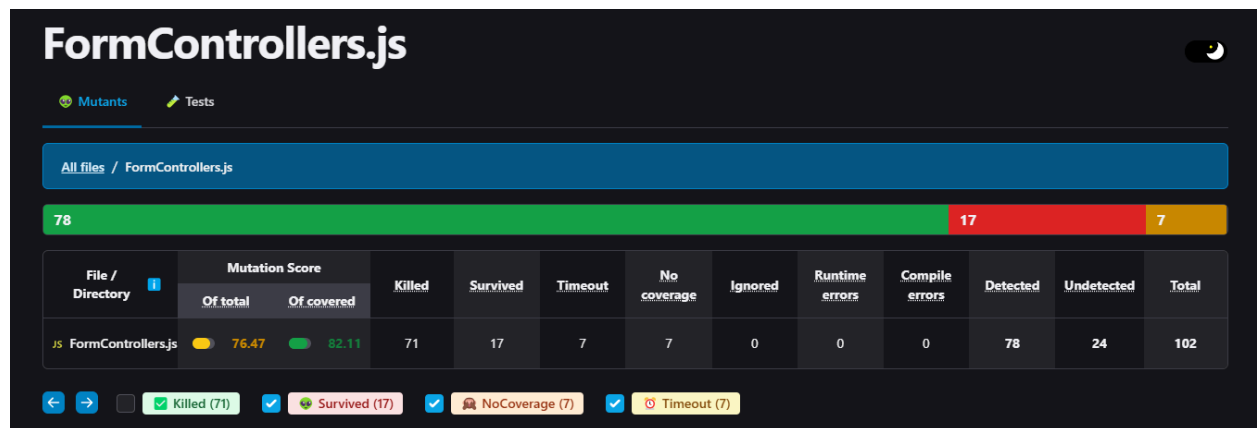
- Positive Scenarios: Successfully submitting forms, retrieving forms, updating statuses, and middleware execution.
- Negative Scenarios: Handling errors such as missing fields, mismatched user email, database errors, duplicate submissions, and invalid form IDs.

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

```
Ran 1.13 tests per mutant on average.
```

File	% Mutation score		# killed	# timeout	# survived	# no cov	# errors
	total	covered					
All files	76.47	82.11	71	7	17	7	0
FormControllers.js	76.47	82.11	71	7	17	7	0

```
02:06:38 (19912) INFO HtmlReporter Your report can be found at: file:///D:/Mutation/G1_Pet_Adoption_System/server/reports/mutation/mutation.html
02:06:38 (19912) INFO MutationTestExecutor Done in 11 seconds.
```



Following are the code lines where mutants were not killed:

Empty query sent

```
12 - const existingForm = await formschema.findOne({email:email,petid:petid});
12 + const existingForm = await formschema.findOne({});
```

ObjectLiteral Survived (12:55) More

Covered by 3 tests (yet still survived)

Changing the conditions

```
16 - if(!name || !email || !address || !firstpet || !whyadopt) {
16 + if(!name || !email || !address || !firstpet) && !whyadopt) {
17     return res.json({success:false,message:"all fields required"});
18 }
```

LogicalOperator Survived (16:16) More

Covered by 2 tests (yet still survived)

Changing the conditions

```
16 - if(!name || !email || !address || !firstpet || !whyadopt) {
16 + if(false || !whyadopt) {
17     return res.json({success:false,message:"all fields required"});
18 }
```

ConditionalExpression Survived (16:16) More

Covered by 2 tests (yet still survived)

Creating an empty object newForm

```

19 -         const newForm = new formschema({
20 -             name: name,
21 -             email: email,
22 -             address: address,
23 -             firstpet: firstpet,
24 -             whyadopt: whyadopt,
25 -             petid: petid,
26 -             status: "pending"
27 -         });
+         const newForm = new formschema({});

```

Changing the status field

```

19         const newForm = new formschema({
20             name: name,
21             email: email,
22             address: address,
23             firstpet: firstpet,
24             whyadopt: whyadopt,
25             petid: petid,
26 -             status: "pending"
+             status: ""
27         });

```

StringLiteral Survived (26:25) [More](#)

Covered by 1 test (yet still survived)

Changing the condition to false:

```

40 -         if (petid) {
+         if (false) {
41             query.petid = petid;
42         }

```

No code inside the if condition:

```

40 -         if (petid) {
41 -             query.petid = petid;
42 -         }
+         if (petid) {}

```

Link to files:

[formController.js](#)

[formCont.js](#)