

MUTATION TESTING:

Introduction

Mutation testing is performed to evaluate the effectiveness of the existing unit test suite. The approach introduces small changes (“mutants”) into the source code to verify whether the tests detect the modifications. A killed mutant indicates strong test coverage; a survived mutant indicates weak or missing tests.

Tools & Frameworks Used



Language: JavaScript


Unit Testing Framework: Vitest

Mutation Testing Tool: Stryker






Project Type : Backend

1. ADMIN CONTROLLER:



 Mutants  Tests


All files 

70 4






File / Directory 	Mutation Score		Killed	Survived	Timeout	No coverage	Ignored	Runtime errors	Compile errors	Detected	Undetected	Total
	Of total	Of covered										
All files	 94.59	 94.59	70	4	0	0	0	0	0	70	4	74
JS adminController.js	 94.59	 94.59	70	4	0	0	0	0	0	70	4	74

2. ANNOUNCEMENT CONTROLLER:



 Mutants  Tests


All files 

17






File / Directory 	Mutation Score		Killed	Survived	Timeout	No coverage	Ignored	Runtime errors	Compile errors	Detected	Undetected	Total
	Of total	Of covered										
All files	 100.00	 100.00	17	0	0	0	0	0	0	17	0	17
JS announcement.controller.js	 100.00	 100.00	17	0	0	0	0	0	0	17	0	17

3. CONTROLLER:

 Mutants  Tests

All files 

85 23

File / Directory 	Mutation Score		Killed	Survived	Timeout	No coverage	Ignored	Runtime errors	Compile errors	Detected	Undetected	Total
	Of total	Of covered										
All files	 78.70	 78.70	85	23	0	0	0	0	0	85	23	108
JS chatbot.controller.js	 78.70	 78.70	85	23	0	0	0	0	0	85	23	108

4.propertyComparison.controller.js

Initial mutation score

File	% Mutation score		# killed	# timeout	# survived	# no cov	# errors
	total	covered					
All files	90.00	90.00	54	0	6	0	0
propertyComparison.controller.js	90.00	90.00	54	0	6	0	0

19:12:07 (22804) INFO HtmlReporter Your report can be found at: file:///C:/Users/NANDINI%20GADHVI/Desktop/testing/IT-314/Backend/reports/mutation/mutation.html

Final mutation score

Ran 1.15 tests per mutant on average.

File	% Mutation score		# killed	# timeout	# survived	# no cov	# errors
	total	covered					
All files	98.33	98.33	59	0	1	0	0
propertyComparison.controller.js	98.33	98.33	59	0	1	0	0

23:27:53 (5728) INFO HtmlReporter Your report can be found at: file:///C:/Users/NANDINI%20GADHVI/Desktop/testing/IT-314/Backend/html

5.saveListing.controller.js

mutation score

Ran 1.60 tests per mutant on average.

File	% Mutation score		# killed	# timeout	# survived	# no cov	# errors
	total	covered					
All files	72.09	72.09	31	0	12	0	0
saveListing.controller.js	72.09	72.09	31	0	12	0	0

6. priceEstimator.controller.js

initial mutation score

Ran 2.21 tests per mutant on average.

File	% Mutation score		# killed	# timeout	# survived	# no cov	# errors
	total	covered					
All files	39.39	43.33	26	0	34	6	0
priceEstimator.controller.js	39.39	43.33	26	0	34	6	0

Final mutation score

Ran 4.73 tests per mutant on average.

File	% Mutation score		# killed	# timeout	# survived	# no cov	# errors
	total	covered					
All files	96.97	96.97	64	0	2	0	0
priceEstimator.controller.js	96.97	96.97	64	0	2	0	0

