

IT314 Software Engineering

MUTATION TESTING - BACKEND
GROUP 29 - Market Connect
Prof. Saurabh Tiwari

Name	Student ID
Dushyant Varshney	202301278
Sheel Shah	202301420
Jeet Modi	202301412
Naman Patel	202301423
Hriday Asnani	202301282
Khushi Pandya	202301406
Hemal Chavda	202301451
Vraj Patel	202301408
Shivansh Shekhar	202301418
Krishna Chaudhari	202301439
Tanish Tanawala	202301405

1. Introduction

Mutation testing measures the effectiveness of a test suite by intentionally introducing small code changes (mutants) and verifying whether the tests detect them. The mutation score represents the proportion of mutants that are successfully identified and eliminated:

$$\text{Mutation Score} = \frac{\text{Killed Mutants}}{\text{Killed Mutants} + \text{Survived Mutants}} \times 100\%.$$

2. Overall Coverage Summary

2.1 Executive Summary



This report summarizes the mutation testing outcomes for files within a full-stack application evaluated using Jest and Stryker.

The mutation score is given by the formula:

$$\text{Mutation Score} = \frac{\text{Killed Mutants}}{\text{Killed Mutants} + \text{Survived Mutants}} \times 100\%$$

Substituting the given values:

$$\text{Mutation Score} = \frac{1843}{1843 + 1746} \times 100\%$$

Simplifying:

$$\text{Mutation Score} = \frac{1843}{3589} \times 100\% \approx 51.35\%$$

Thus, the final mutation score is:

51.35%

3. Terminal Outputs and Runs

Output at Terminal

Static Performance Metrics						
File	Mean Response Time (ms)	Min Response Time (ms)	Max Response Time (ms)	Success Rate (%)	Failure Rate (%)	Total Requests
categoryController.js	33.93	33.93	76	0	148	
chatController.js	64.29	64.29	81	0	45	
couponController.js	35.92	35.92	51	0	91	
orderController.js	94.10	94.10	18	333	22	
paymentController.js	100.00	100.00	0	386	0	
productController.js	52.20	52.20	178	0	163	
returnController.js	37.66	37.66	200	0	331	
reviewController.js	35.98	35.98	59	0	105	
sellerAnalyticsController.js	25.18	25.18	35	0	104	
paymentController.js	100.00	100.00	0	386	0	
productController.js	52.20	52.20	178	0	163	
returnController.js	37.66	37.66	200	0	331	
reviewController.js	35.98	35.98	59	0	105	
sellerAnalyticsController.js	25.18	25.18	35	0	104	
returnController.js	37.66	37.66	200	0	331	
reviewController.js	35.98	35.98	59	0	105	
sellerAnalyticsController.js	25.18	25.18	35	0	104	

4. Results

1843				1746								
File / Directory	Mutation Score		Killed	Survived	Timeout	No coverage	Ignored	Runtime errors	Compile errors	Detected	Undetected	Total
	Of total	Of covered										
All files	51.35	51.35	1124	1746	719	0	0	1	0	1843	1746	3590
JS auctionController.js	35.37	35.37	58	106	0	0	0	0	0	58	106	164
JS cartController.js	33.77	33.77	77	151	0	0	0	0	0	77	151	228
JS categoryController.js	33.93	33.93	76	148	0	0	0	0	0	76	148	224
JS chatController.js	64.29	64.29	81	45	0	0	0	0	0	81	45	126
JS couponController.js	35.92	35.92	51	91	0	0	0	0	0	51	91	142
JS orderController.js	94.10	94.10	18	22	333	0	0	0	0	351	22	373
JS paymentController.js	100.00	100.00	0	0	386	0	0	0	0	386	0	386
JS productController.js	52.20	52.20	178	163	0	0	0	0	0	178	163	341
JS returnController.js	37.66	37.66	200	331	0	0	0	0	0	200	331	531
JS reviewController.js	35.98	35.98	59	105	0	0	0	0	0	59	105	164