

# IT314 Software Engineering

## MUTATION TESTING - BACKEND

GROUP 29 - Market Connect

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# 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:

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

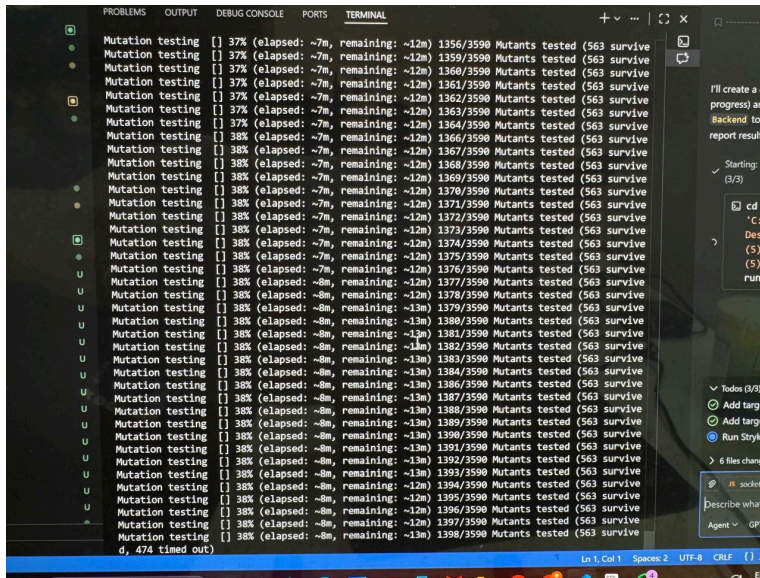
Simplifying:

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

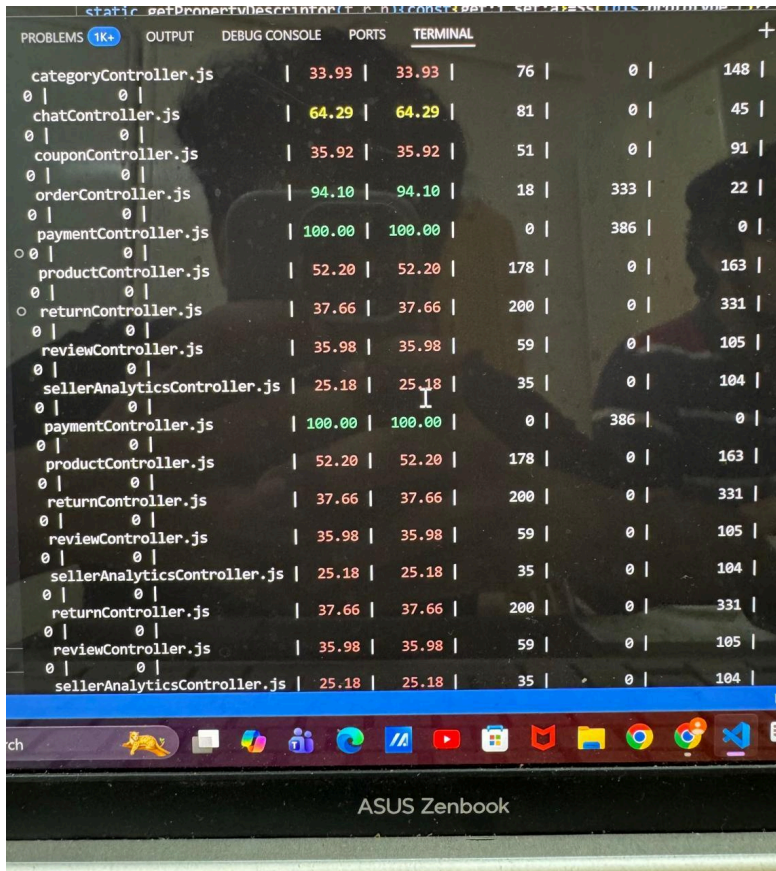
Thus, the final mutation score is:

51.35%
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### 3. Terminal Outputs and Runs



### Output at Terminal



## 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	<div><div></div></div> 51.35	<div><div></div></div> 51.35	1124	1746	719	0	0	1	0	1843	1746	3590
JS auctionController.js	<div><div></div></div> 35.37	<div><div></div></div> 35.37	58	106	0	0	0	0	0	58	106	164
JS cartController.js	<div><div></div></div> 33.77	<div><div></div></div> 33.77	77	151	0	0	0	0	0	77	151	228
JS categoryController.js	<div><div></div></div> 33.93	<div><div></div></div> 33.93	76	148	0	0	0	0	0	76	148	224
JS chatController.js	<div><div></div></div> 64.29	<div><div></div></div> 64.29	81	45	0	0	0	0	0	81	45	126
JS couponController.js	<div><div></div></div> 35.92	<div><div></div></div> 35.92	51	91	0	0	0	0	0	51	91	142
JS orderController.js	<div><div></div></div> 94.10	<div><div></div></div> 94.10	18	22	333	0	0	0	0	351	22	373
JS paymentController.js	<div><div></div></div> 100.00	<div><div></div></div> 100.00	0	0	386	0	0	0	0	386	0	386
JS productController.js	<div><div></div></div> 52.20	<div><div></div></div> 52.20	178	163	0	0	0	0	0	178	163	341
JS returnController.js	<div><div></div></div> 37.66	<div><div></div></div> 37.66	200	331	0	0	0	0	0	200	331	531
JS reviewController.js	<div><div></div></div> 35.98	<div><div></div></div> 35.98	59	105	0	0	0	0	0	59	105	164