

QA Analysis Summary (Integrated E2E + JUnit)				
Metric	Value	Formula / Source	Notes	
Total Test Cases	24	N/A	8 (E2E) + 16 (JUnit)	
Executed Tests	24	N/A	All tests executed	
Passed Test Cases	13	N/A	Moderate execution success	
Failed Test Cases	11	N/A	45.8% fail rate	
Total Defects	10	N/A	6 (E2E) + 5 (JUnit)	
Pass Rate (%)	54.17%	PassedTestCases/TotalExecutedTestCases	Indicates mid-level reliability	
Requirement Coverage (%)	100.00%	CoveredReq/TotalReq	N/A	
Defect Density (%)	45.83%	TotalDefects/TotalExecutedTestCases	High defect ratio	
High/Critical Defects (%)	90.91%	(High+Critical)/TotalDefects	Prioritize fixes	

Metrics

Metric	Value (%)
Pass Rate (%)	54.17
Requirement Coverage (%)	100.00
Defect Density (%)	45.83
High/Critical Defects (%)	90.91

Requirement Traceability Matrix

Requirement ID	Description	Risk Level	Priority	Status	Fail Reason / Defect Summary	Test Cases
REQ-BR-01	Two seat classes (Business & Economy) must be handled distinctly.	Medium	P1	Fail	Seat duplication occurs after consecutive ticket issues; seat state not updated properly (E2E-TC02, JUNIT-TC01-TC04)	JUNIT-BUSROW-TC01, JUNIT-SEATDUP-TC02, JUNIT-SEATPLAN-TC03, JUNIT-SEATRES-TC04, JUNIT-SEATRES-TC06, E2E-Y-ISSUE-L1-TC01-TC04
REQ-BR-02	Business class ticket costs \$750 (no discount).	Low	P1	Pass	N/A	JUNIT-SELL-TC07, JUNIT-SELL-TC15, E2E-Y-ISSUE-L1-TC01-TC02
REQ-BR-03	Economy class ticket cost \$500 base price.	Low	P2	Pass	N/A	JUNIT-SELL-TC13
REQ-BR-04	Passenger type (Frequent Flyer, Employee, Neither) mutually exclusive.	Medium	P1	Pass	N/A	JUNIT-SEATDUP-TC02, JUNIT-FRY-TC03, E2E-Y-ISSUE-L1-TC01-TC02
REQ-BR-05	Airline employees get 50% discount on Economy.	Medium	P1	Fail	Economy discount not applied (expected \$250, actual \$500).	JUNIT-SELL-TC08
REQ-BR-06	Employees get no discount on Business class.	Low	P2	Pass	N/A	JUNIT-SELL-TC14
REQ-BR-07	Frequent flyers get no discount but retain privileges.	Low	P3	Pass	N/A	JUNIT-FRY-TC09, E2E-H-ISSUE-L1-TC01-TC02
REQ-NO-01	Airplane has 14 seats total.	High	P1	Fail	Ticket issuance continues beyond 14 seats; no overflow validation.	JUNIT-SELL-TC15
REQ-NO-02	Row 1 = Business class (1A, 1B).	Medium	P1	Fail	Seat allocation error: Business seats reused after sale.	JUNIT-SEATDUP-TC02, JUNIT-BUSROW-TC01, JUNIT-SEATDUP-TC02, E2E-Y-ISSUE-L1-TC01-TC04
REQ-NO-03	Rows 2-4 = Economy class (A-D).	Medium	P1	Fail	Economy row count mismanaged; extra seat beyond limit generated.	JUNIT-SEATPLAN-TC03, JUNIT-SEATRES-TC05, JUNIT-SEATRES-TC06, JUNIT-SEATRES-TC12, JUNIT-SELL-TC09
REQ-NO-04	Output printed to console with prompts and loops.	Low	P2	Fail	Input validation loop repeats indefinitely; "Please answer Y/N" not consistently shown.	JUNIT-SELL-TC03, JUNIT-PASS-TC10-TC11, JUNIT-PASS-TC16, E2E-Y-ISSUE-L1-TC01-TC08

Requirement Status Overview

Status	Count	%
Passed Reqs	5	45.45%
Failed Reqs	6	54.55%

Requirement Pass/Fail Status

Category	Value
Passed Reqs	45.5%
Failed Reqs	54.5%

Defect Analysis by Priority & Severity

Phase	Target Area	Key Issues	Required Fix	Related Requirements
1 (Critical)	Seat management & sale logic	Seat duplication, flyer validation record	Lock seat map, sync sale record	BR-01, NO-01, NO-02, NO-03
2 (Stability)	Pricing & validation logic	Employee discount not applied correctly (expected \$250 → actual \$500); inconsistent input handling	Fix discount calculation in SelfTicket, integrate validation parser for user inputs	BR-05, NO-04
3 (Usability)	Prompt and console response	Message display inconsistency	Unify console outputs	NO-04, NO-08

Key Observations

Category	Key Findings
Seat Synchronization Issues	E2E and JUnit both detect duplication between Business and Economy seats after multiple transactions (BR-01, NO-01, NO-02).
Discount Logic Failure	Employee discount logic malfunctioning under Economy ticket flow (BR-05).
Prompt Validation Instability	Input validation not breaking properly after invalid entry, repeating more than expected (NO-04).
Console Output Inconsistency	"Unavailable" seat tag and flight manifest outputs not consistently formatted (NO-04).

Improvement Roadmap

Next Steps	Actions
Refactor Seat Reservation Module	1. Refactor Seat Reservation Module
Correct Employee Discount Logic	2. Correct Employee Discount Logic
Centralize Input Validation Handler	3. Centralize Input Validation Handler
Standardize Console Output	4. Standardize Console Output
Conduct Regression	5. Conduct Regression