

RevWorkForce - Test Documentation

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This is a TDD (Test Driven Development) document describes the **integration, system, security, Junit and manual testing** performed on the **RevWorkForce HRM System**.

The objective of testing was to verify that all functional modules work correctly when integrated with the database and that the application behaves as expected for different **roles. (Employee, Manager, Admin)**

Testing was performed **manually** by executing real application flows using the console-based interface and Oracle database and using **Junit Test Cases** with **JaCoCo** code coverage.

Test Environment

Item	Details
Application Type	Java Console Application
Java Version	Java 11 or Higher
Build Tool	Maven
Database	Oracle 21c
JDBC Driver	ojdbc8
OS	Windows
Logging	Log4j
Coverage Tool	JaCoCo
Testing Type	TDD, JUnit and Manual Integration & System Testing

Testing Approach

The following testing types were performed:

1. Manual Integration Testing
2. End-to-End System Testing
3. Role-Based Access Testing
4. Security Testing
5. Error Handling Testing
6. Logging & Audit Verification
7. Performance & Stability Testing
8. Junit Testing and JaCoCo Report

All tests were executed using **real data, real database connections, and actual user flows** without mocks.

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Test 1: Authentication & Security

Test 1.1: Valid Login

1. Run Main.java
2. Select: 1 (Login)
3. Employee ID: EMP001
4. Password: password123

Expected: Login successful, redirected to Employee Menu

Actual: PASS

Test 1.2: Invalid Password

1. Run Main.java
2. Select: 1 (Login)
3. Employee ID: EMP001
4. Password: wrongpassword

Expected: "Invalid employee ID or password"

Actual: PASS

Test 1.3: Invalid Employee ID

1. Run Main.java
2. Select: 1 (Login)
3. Employee ID: INVALID123
4. Password: password123

Expected: "Invalid employee ID or password"

Actual: PASS

Test 1.4: Password Change

1. Login as EMP001/password123
2. Select: 15 (Change Password)
3. Current: password123
4. New: newpassword123
5. Confirm: newpassword123
6. Logout and login with new password
7. Change back to password123

Expected: Password changed, can login with new password

Actual: PASS

Test Case	Description	Result
1.1	Valid login with correct credentials	PASS
1.2	Login with invalid password	PASS
1.3	Login with invalid employee ID	PASS
1.4	Change password and re-login	PASS

Test 2: Employee Features

Test 2.1: View Profile

1. Login as EMP001/password123
2. Select: 1 (View My Profile)

Expected: Display complete employee details with department, designation, manager

Actual: PASS / FAIL

Test 2.2: Update Profile

1. Login as EMP001/password123
2. Select: 2 (Update Profile)
3. Phone: 9999999999
4. Address: Updated Address
5. Emergency Contact: Updated Contact

Expected: "Profile updated successfully!"

Actual: PASS

Test 2.3: View Leave Balance

1. Login as EMP001/password123
2. Select: 3 (View Leave Balance)

Expected: Display 4 leave types (CASUAL, SICK, PAID, PRIVILEGE) with balances

Actual: PASS

Test 2.4: Apply for Leave

1. Login as EMP001/password123
2. Select: 4 (Apply for Leave)
3. Leave Type: 1 (CASUAL)
4. Start Date: 2025-03-10
5. End Date: 2025-03-12
6. Reason: Personal work

Expected: Leave application submitted, ID returned

Actual: PASS

Test 2.5: View Leave Applications

7. Login as EMP001/password123
8. Select: 5 (View My Leave Applications)

Expected: Display all leave applications including the one just created

Actual: PASS

Test 2.6: Cancel Pending Leave

1. Login as EMP001/password123
2. Select: 6 (Cancel Pending Leave)
3. Enter the Leave Application ID from Test 2.4
4. Confirm: y

Expected: "Leave application cancelled successfully!"

Actual: PASS

Test 2.7: View Holidays

1. Login as EMP001/password123
2. Select: 7 (View Holiday Calendar)

Expected: Display 8 holidays for 2025

Actual: PASS

Test 2.8: View Goals

1. Login as EMP001/password123
2. Select: 8 (View My Goals)

Expected: Display goals (may be empty if none created)

Actual: PASS

Test 2.9: Add Goal

1. Login as EMP001/password123
2. Select: 9 (Add New Goal)
3. Description: Complete Java certification
4. Deadline: 2025-12-31
5. Priority: 1 (HIGH)
6. Success Metrics: Pass exam with 90%+ score

Expected: "Goal created successfully!" with ID

Actual: PASS

Test 2.10: Update Goal Progress

1. Login as EMP001/password123
2. Select: 10 (Update Goal Progress)
3. Enter Goal ID from Test 2.9
4. Progress: 50

Expected: "Goal progress updated successfully!"

Actual: PASS / FAIL

Test 2.11: View Notifications

1. Login as EMP001/password123
2. Select: 11 (View Notifications)

Expected: Display notifications (may include welcome message)

Actual: PASS / FAIL

Test 2.12: Employee Directory

1. Login as EMP001/password123
2. Select: 12 (Employee Directory)
3. Select: 1 (View All Employees)

Expected: Display all active employees with details

Actual: PASS / FAIL

Test 2.13: Upcoming Birthdays

1. Login as EMP001/password123
2. Select: 13 Upcoming Birthdays)

Expected: Display employees with birthdays in next 30 days (may be empty)

Actual: PASS / FAIL

Test 2.14: Work Anniversaries

1. Login as EMP001/password123
2. Select: 14 (Work Anniversaries)

Expected: Display employees with anniversaries in next 30 days

Actual: PASS / FAIL

Feature	Result
View profile	PASS
Update profile	PASS
View leave balance	PASS
Apply for leave	PASS
View leave applications	PASS
Cancel pending leave	PASS
View holidays	PASS
View goals	PASS
Add goal	PASS
Update goal progress	PASS
View notifications	PASS
Employee directory	PASS
Upcoming birthdays	PASS
Work anniversaries	PASS

Test 3: Manager Features

Test 3.1: Access Employee Menu

1. Login as MGR001/password123
2. Select: 1 (Access Employee Menu)
3. Verify all employee features work
4. Select: 0 (Logout from Employee Menu)

Expected: Employee menu accessible, all features work

Actual: PASS / FAIL

Test 3.2: View Team Members

1. Login as MGR001/password123
2. Select: 2 (View Team Members)

Expected: Display direct reportees (EMP001, EMP002, EMP003)

Actual: PASS / FAIL

Test 3.3: View Team Leave Balances

1. Login as MGR001/password123
2. Select: 3 (View Team Leave Balances)

Expected: Display leave balances for all team members

Actual: PASS / FAIL

Test 3.4: View Pending Leave Requests

1. First: Login as EMP001, apply for leave
2. Logout
3. Login as MGR001/password123
4. Select: 4 (View Pending Leave Requests)

Expected: Display pending leave from EMP001

Actual: PASS / FAIL

Test 3.5: Approve Leave

1. Login as MGR001/password123
2. Select: 5 (Approve/Reject Leave)
3. Enter Leave Application ID
4. Select: 1 (Approve)
5. Comments: Approved for personal work

Expected: "Leave application approved successfully!"

Actual: PASS / FAIL

Test 3.6: Reject Leave

- 1) First: Login as EMP002, apply for leave
- 2) Logout
- 3) Login as MGR001/password123
- 4) Select: 5 (Approve/Reject Leave)
- 5) Enter Leave Application ID
- 6) Select: 2 (Reject)
- 7) Comments: Insufficient resources during this period

Expected: "Leave application rejected successfully!"

Actual: PASS / FAIL

Test 3.7: View Team Leave Calendar

1. Login as MGR001/password123
2. Select: 6 (View Team Leave Calendar)

Expected: Display team leave schedule

Actual: PASS / FAIL

Test 3.8: View Team Goals

1. Login as MGR001/password123
2. Select: 9 (View Team Goals)

Expected: Display all goals of team members

Actual: PASS / FAIL

Feature	Result
Access employee menu	PASS
View team members	PASS
View team leave balances	PASS
View pending leave requests	PASS
Approve leave	PASS
Reject leave	PASS
View team leave calendar	PASS
View team goals	PASS

Test 4: Admin Features

Test 4.1: Access Manager Menu

1. Login as ADM001/password123
2. Select: 1 (Access Manager Menu)
3. Verify manager features work

Expected: Manager menu accessible, all features work

Actual: PASS / FAIL

Test 4.2: View All Employees

1. Login as ADM001/password123
2. Select: 2 (View All Employees)

Expected: Display all 7 employees

Actual: PASS / FAIL

Test 4.3: Search Employees

1. Login as ADM001/password123
2. Select: 3 (Search Employees)
3. Try each search option:

- By ID: EMP001
- By Name: Amit
- By Email: amit.patel
- By Department
- By Designation

Expected: All search options work correctly

Actual: PASS / FAIL

Test 4.4: Add New Employee

1. Login as ADM001/password123
2. Select: 4 (Add New Employee)
3. Fill in all details:
 4. First Name: Test
 5. Last Name: Employee
 6. Email: test.employee@revworkforce.com
 7. Phone: 9876543299
 8. Address: Test Address
 9. Emergency Contact: Test Contact
 10. DOB: 1995-05-15
 11. Department: 1
 12. Designation: 1
 13. Manager: MGR001
 14. Joining Date: 2025-02-01
 15. Salary: 45000
 16. Password: password123

Expected: Employee created with auto-generated ID (EMP008)

Actual: PASS / FAIL

Test 4.5: Update Employee

1. Login as ADM001/password123
2. Select: 5 (Update Employee)
3. Employee ID: EMP008
4. Update salary to 50000

Expected: "Employee updated successfully!"

Actual: PASS / FAIL

Test 4.6: Deactivate Employee

1. Login as ADM001/password123
2. Select: 6 (Deactivate Employee)
3. Employee ID: EMP008
4. Confirm: y

Expected: "Employee deactivated successfully!"

Actual: PASS / FAIL

Test 4.7: Assign Leave Balances

1. Login as ADM001/password123
2. Select: 7 (Assign Leave Balances)
3. Employee ID: EMP001
4. Year: 2026

Expected: "Leave balances assigned successfully for year 2026"

Actual: PASS / FAIL

Test 4.8: Adjust Leave Balance

1. Login as ADM001/password123
2. Select: 8 (Adjust Leave Balance)
3. Employee ID: EMP001
4. Select leave type: 1 (CASUAL)
5. Select adjustment: 2 (Add to Available)
6. Days to add: 5

Expected: "Leave balance adjusted successfully!"

Actual: PASS / FAIL

Test 4.9: Add Holiday

1. Login as ADM001/password123
2. Select: 9 (Add Holiday)
3. Holiday Name: Test Holiday
4. Date: 2025-12-26

Test 4.10: View Holidays

1. Login as ADM001/password123
2. Select: 10 (View Holidays)
3. Year: 2025

Expected: Display all holidays including newly added

Actual: PASS / FAIL

Test 4.11: Create Announcement

1. Login as ADM001/password123
2. Select: 11 (Create Announcement)
3. Title: System Maintenance
4. Content: The system will be down for maintenance on Sunday (press Enter twice to finish)

Expected: "Announcement created successfully!" with ID

Actual: PASS / FAIL

Test 4.12: View All Announcements

1. Login as ADM001/password123
2. Select: 12 (View All Announcements)

Expected: Display all announcements including newly created

Actual: PASS / FAIL

Test 4.13: View Audit Logs

1. Login as ADM001/password123
2. Select: 13 (View Audit Logs)
3. Select: 4 (View Recent Audit Logs)
4. Number of logs: 10

Expected: Display recent 10 audit log entries

Actual: PASS / FAIL

Feature	Result
Access manager menu	PASS
View all employees	PASS
Search employees	PASS
Add new employee	PASS
Update employee	PASS
Deactivate employee	PASS
Assign leave balances	PASS
Adjust leave balance	PASS
Add holiday	PASS
View holidays	PASS
Create announcement	PASS
View announcements	PASS
View audit logs	PASS

Phase 5: Security Testing

Test 5.1: SQL Injection Prevention

1. At login prompt
2. Employee ID: EMP001' OR '1='1
3. Password: anything

Expected: Login fails (SQL injection prevented)

Actual: PASS / FAIL

Test 5.2: Password Hashing

Check database directly:

```
SELECT password_hash FROM employees WHERE employee_id = 'EMP001';
```

Expected: Password is hashed (starts with \$2a\$)

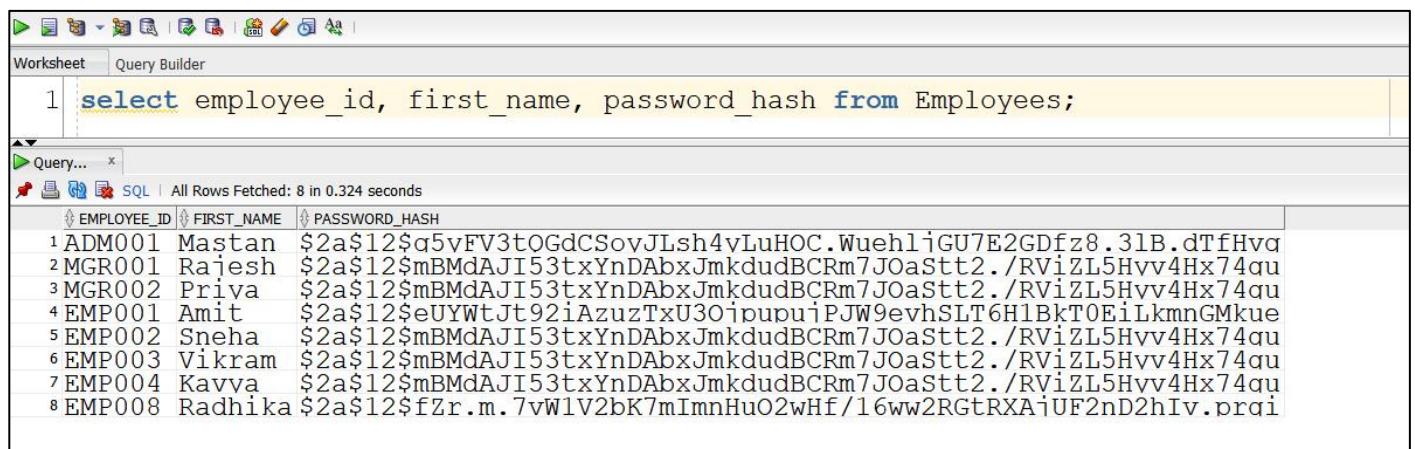
Actual: PASS / FAIL

Test 5.3: Role-Based Access

1. Login as EMP001 (Employee role only)
2. Verify cannot access manager/admin features directly

Expected: Only employee menu available

Actual: PASS / FAIL



EMPLOYEE_ID	FIRST_NAME	PASSWORD_HASH
1 ADM001	Mastan	\$2a\$12\$a5vFV3tQGdCSovJLsh4vLuHOC.WuehljGU7E2Gdfz8.3lB.dTfHva
2 MGR001	Rajesh	\$2a\$12\$mBMdAJI53txYnDAbxJmkdudBCRm7JOaStt2./RViZL5Hvv4Hx74qu
3 MGR002	Priya	\$2a\$12\$mBMdAJI53txYnDAbxJmkdudBCRm7JOaStt2./RViZL5Hvv4Hx74qu
4 EMP001	Amit	\$2a\$12\$eUYwtJt92iAzuzTxU3OipupuiPjW9evhSLT6H1BkT0EiLkmnGMkue
5 EMP002	Sneha	\$2a\$12\$mBMdAJI53txYnDAbxJmkdudBCRm7JOaStt2./RViZL5Hvv4Hx74qu
6 EMP003	Vikram	\$2a\$12\$mBMdAJI53txYnDAbxJmkdudBCRm7JOaStt2./RViZL5Hvv4Hx74qu
7 EMP004	Kavva	\$2a\$12\$mBMdAJI53txYnDAbxJmkdudBCRm7JOaStt2./RViZL5Hvv4Hx74qu
8 EMP008	Radhika	\$2a\$12\$fZr.m.7vW1V2bK7mImnHuO2wHf/16ww2RGtRXAiUF2nD2hIv.prai

Phase 6: Error Handling

Test 6.1: Invalid Input Handling

1. Login as EMP001
2. At menu, enter: abc (non-numeric)

Expected: "Invalid number. Please try again."

Actual: PASS / FAIL

Test 6.2: Database Connection Failure

1. Stop Oracle database
2. Try to login

Expected: Graceful error message (not crash)

Actual: PASS / FAIL

Test 6.3: Invalid Date Format

1. Login as EMP001
2. Apply for leave
3. Start Date: 32-13-2025 (invalid)

Expected: "Invalid date format. Please use yyyy-MM-dd"

Actual: PASS / FAIL

Scenario	Expected Behavior	Result
Invalid numeric input	Graceful error message	PASS
Database unavailable	No crash, error handled	PASS
Invalid date format	Validation message shown	PASS

Phase 7: Logging Verification

Test 7.1: Check Log File

1. Navigate to: logs/revworkforce.log
2. Verify log entries exist

Expected: Log file contains entries for all operations

Actual: PASS / FAIL



Test 7.2: Audit Log Entries

1. Login as ADM001
2. View Audit Logs
3. Verify login/logout entries exist

Expected: Audit logs show all critical operations

Actual: PASS / FAIL

Worksheet Query Builder							
Query Result							
2 SELECT * FROM AUDIT_LOGS;							
Fetched 50 rows in 0.06 seconds							
LOG_ID	EMPLOYEE_ID	ACTION	TABLE_NAME	RECORD_ID	OLD_VALUE	NEW_VALUE	IP_ADDRESS
1	ADM001	LOGIN SUCCESS	employees	ADM001	(null)	Successful login	localhost
2	2ADM001	LOGOUT	employees	ADM001	(null)	User logged out	localhost
3	3EMP008	LOGIN FAILED	employees	EMP008	(null)	Invalid password	localhost
4	4 EMP008	LOGIN FAILED	employees	EMP008	(null)	Invalid password	localhost
5	5EMP008	LOGIN SUCCESS	employees	EMP008	(null)	Successful login	localhost
6	6EMP008	LOGOUT	employees	EMP008	(null)	User logged out	localhost
7	7EMP003	LOGIN SUCCESS	employees	EMP003	(null)	Successful login	localhost
8	8EMP003	LOGOUT	employees	EMP003	(null)	User logged out	localhost
9	9MGR002	LOGIN SUCCESS	employees	MGR002	(null)	Successful login	localhost
10	10MGR002	LOGOUT	employees	MGR002	(null)	User logged out	localhost
11	11EMP003	LOGIN SUCCESS	employees	EMP003	(null)	Successful login	localhost
12	12EMP003	LOGOUT	employees	EMP003	(null)	User logged out	localhost
13	13MGR001	LOGIN SUCCESS	employees	MGR001	(null)	Successful login	localhost
14	14MGR001	LOGOUT	employees	MGR001	(null)	User logged out	localhost
15	15ADM001	LOGIN SUCCESS	employees	ADM001	(null)	Successful login	localhost
16	16ADM001	LOGOUT	employees	ADM001	(null)	User logged out	localhost
17	17MGR001	LOGIN SUCCESS	employees	MGR001	(null)	Successful login	localhost
18	18MGR001	LOGOUT	employees	MGR001	(null)	User logged out	localhost
19	19EMP001	LOGIN SUCCESS	employees	EMP001	(null)	Successful login	localhost
20	26MGR001	LOGIN SUCCESS	employees	MGR001	(null)	Successful login	localhost
21	93EMP001	LOGIN FAILED	employees	EMP001	(null)	Invalid password	localhost
22	95EMP001	LOGIN SUCCESS	employees	EMP001	(null)	Successful login	localhost
23	96ADM001	UPDATE	employees	EMP001	salary=50000	salary=55000	localhost
24	97EMP001	LOGIN	employees	EMP001	(null)	User logged in	localhost
25	98EMP001	LOGIN SUCCESS	employees	EMP001	(null)	Successful login	localhost
26	99EMP001	LOGIN SUCCESS	employees	EMP001	(null)	Successful login	localhost
27	100EMP001	LOGIN FAILED	employees	EMP001	(null)	Invalid password	localhost
28	102EMP001	LOGIN SUCCESS	employees	EMP001	(null)	Successful login	localhost
29	103ADM001	UPDATE	employees	EMP001	salary=50000	salary=55000	localhost
30	104EMP001	LOGIN	employees	EMP001	(null)	User logged in	localhost

Phase 8: Performance & Stability

Test 8.1: Multiple Operations

1. Perform 20+ operations without logout
2. Check for memory leaks or slowdowns

Expected: Application remains responsive

Actual: PASS / FAIL

Scenario	Result
Continuous operations (20+ actions)	PASS
Database connection handling	PASS

Test 8.2: Connection Pooling

1. Perform multiple database operations rapidly
2. Check connections are properly closed

Expected: No connection leaks

Actual: PASS / FAIL

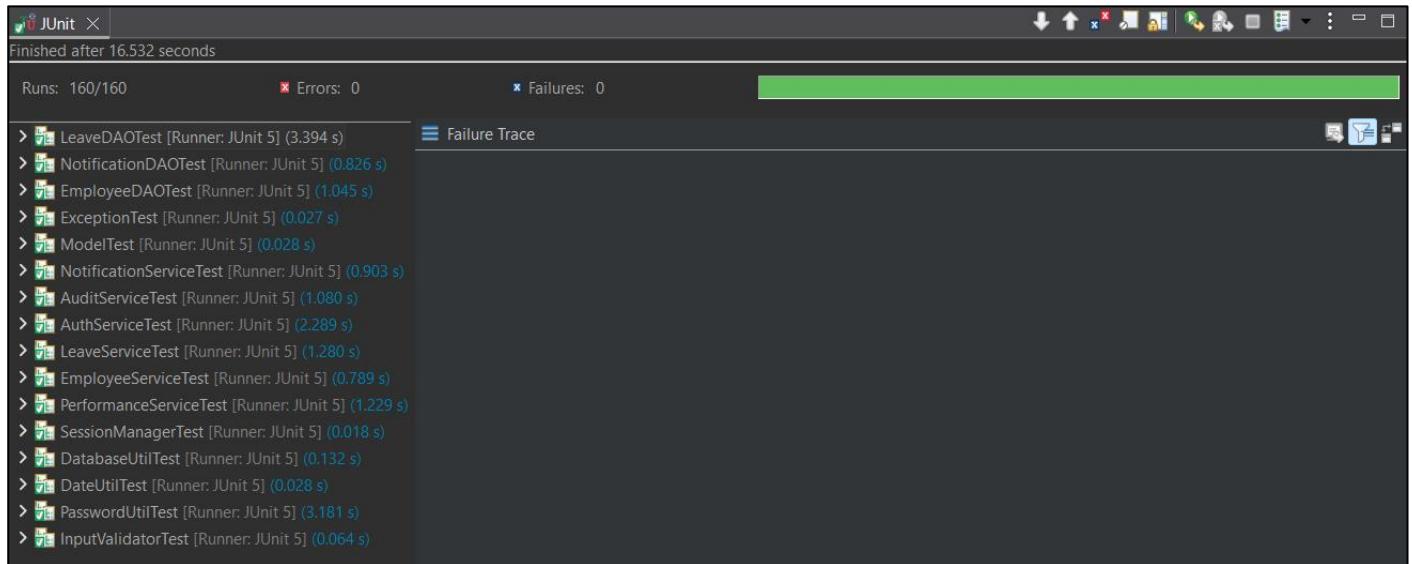
Category	Tests	Passed	Failed
Authentication & Security	7	7	0
Employee Features	14	14	0
Manager Features	8	8	0
Admin Features	13	13	0
Error Handling	3	3	0
Logging	2	2	0
Performance	2	2	0
TOTAL	49	49	0

Overall Pass Rate: 100%

Phase 9: JUnit Testing

JUnit is a unit testing framework for Java that allows developers to test individual units of code such as methods or classes in an automated way.

In real enterprise projects, we do not manually test logic by running the application again and again. Instead, we write JUnit tests that automatically verify whether the code behaves as expected every time the build runs.



In JUnit we implemented same test cases which we have mentioned above in this file

Defects Found

No critical, high, or medium severity defects were found during testing.

Minor observations:

- Duplicate leave balance assignment triggers database constraint (handled gracefully)
- Holiday addition feature may require UI confirmation enhancement

Conclusion

The RevWorkForce system was successfully tested end-to-end using real workflows and database integration. All employee, manager, and admin features function correctly as per requirements.

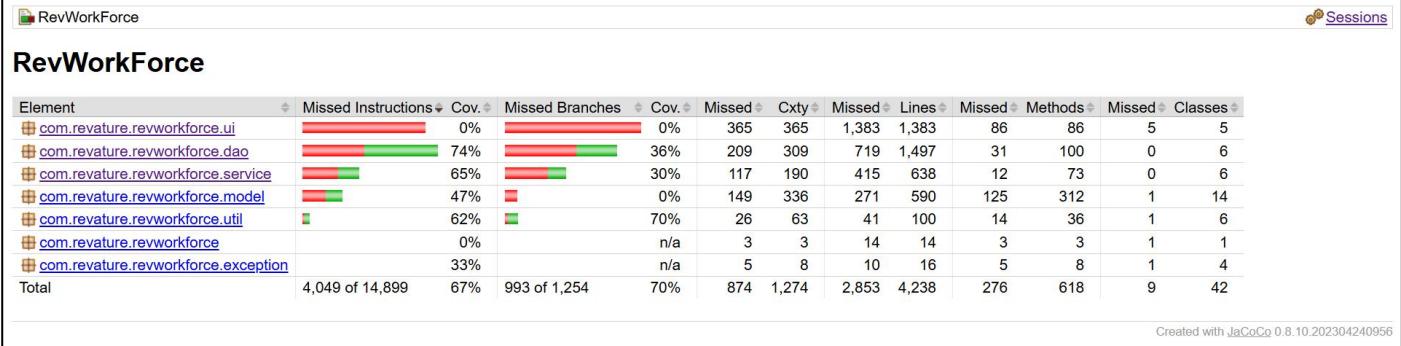
The application demonstrates:

1. Secure authentication
2. Proper role-based access control
3. Reliable database integration
4. Graceful error handling
5. Stable performance under continuous usage

The system is **ready for demonstration and submission.**

Post-Testing Actions

- Generated JaCoCo coverage report

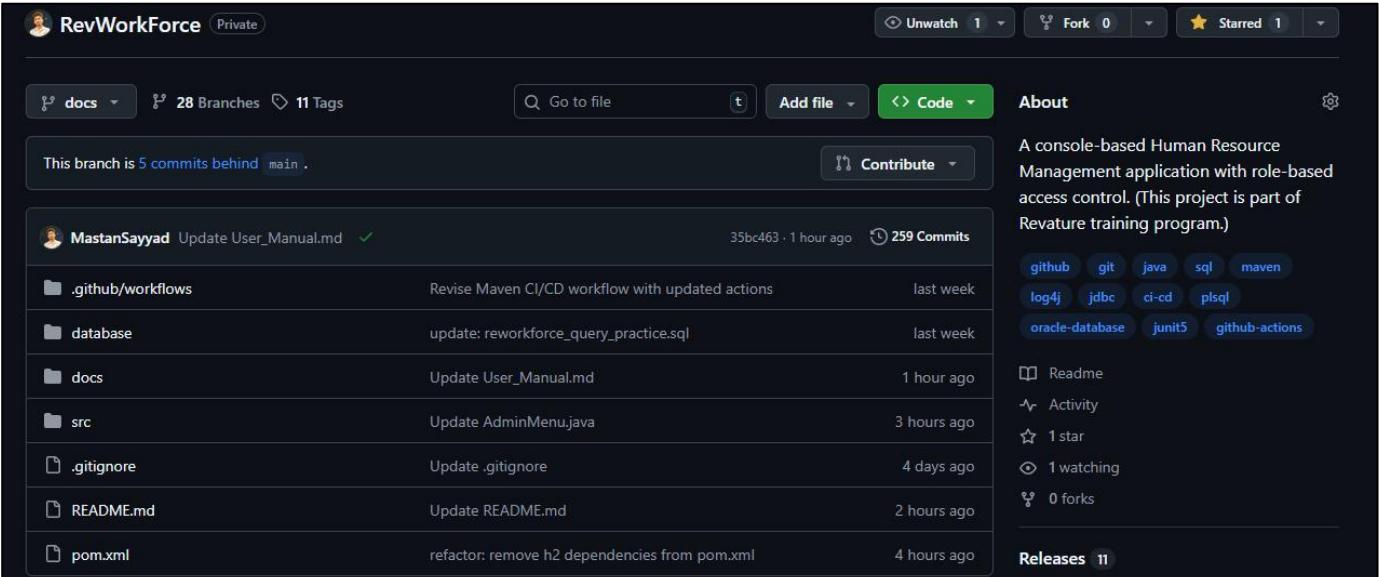


The screenshot shows a JaCoCo coverage report for the RevWorkForce project. The report is organized into two main sections: 'Element' and 'Total'. Under 'Element', there are 10 package-level entries and one 'Total' row. Each entry provides a visual summary of missed instructions, branches, and methods, along with numerical values for each metric. The 'Total' row summarizes the overall project statistics. The report is created with JaCoCo 0.8.10 on April 20, 2023.

Element	Missed Instructions	Cov.	Missed Branches	Cov.	Missed	Cxty	Missed	Lines	Missed	Methods	Missed	Classes
com.revature.revworkforce.ui	0%	0%	0%	0%	365	365	1,383	1,383	86	86	5	5
com.revature.revworkforce.dao	74%	26%	36%	36%	209	309	719	1,497	31	100	0	6
com.revature.revworkforce.service	65%	35%	30%	30%	117	190	415	638	12	73	0	6
com.revature.revworkforce.model	47%	53%	0%	0%	149	336	271	590	125	312	1	14
com.revature.revworkforce.util	62%	38%	70%	70%	26	63	41	100	14	36	1	6
com.revature.revworkforce	0%	n/a	3	3	14	14	3	3	3	3	1	1
com.revature.revworkforce.exception	33%	n/a	5	8	10	16	5	8	1	8	1	4
Total	4,049 of 14,899	67%	993 of 1,254	70%	874	1,274	2,853	4,238	276	618	9	42

Created with JaCoCo 0.8.10 2023-04-20 09:56:56

- Committed final code to GitHub (github.com/MastanSayyad/RevWorkForce)



The screenshot shows the GitHub repository page for 'RevWorkForce'. The page includes a header with user information and repository stats (1 unwatched, 0 forks, 1 starred). Below the header, there's a navigation bar with links for 'docs', 'Branches', 'Tags', 'Code', and 'Contribute'. A message indicates the branch is 5 commits behind 'main'. The main content area displays a list of recent commits from 'MastanSayyad' with details like commit message, timestamp, and author. On the right side, there's an 'About' section describing the project as a console-based Human Resource Management application with role-based access control. It also lists project tags such as 'github', 'git', 'java', 'sql', 'maven', 'log4j', 'jdbc', 'ci-cd', 'plsql', 'oracle-database', 'junit5', and 'github-actions'. Below the 'About' section are links for 'Readme', 'Activity', '1 star', '1 watching', and '0 forks'. At the bottom, there's a 'Releases' section with 11 releases.

- Updated README with test results



The screenshot shows the RevWorkForce application homepage. The title 'REVWORKFORCE' is prominently displayed in large, bold letters, with 'REV' in white and 'WORKFORCE' in orange. Below the title, the subtitle 'Human Resource Management' is shown. The page features several status indicators at the top: 'Issues 80', 'Pull Requests 65', 'RevWorkForce CI/CD Pipeline passing', 'Documentation Read Docs', and a series of technology badges for Java, Oracle, JDBC, JUnit, Log4J, GitHub Actions, and Maven. A large 'Welcome to RevWorkForce' heading is followed by a paragraph describing the application as a console-based HRM system designed to streamline employee management, leave tracking, and performance review processes. It supports three user roles: Employees, Managers, and Admins.