

## SOFTWARE TESTING

# FINAL PROJECT REPORT

## PARABANK BANKING APPLICATION

Comprehensive Manual & Automated Testing

Application	Parabank - Advanced Banking Simulation
URL	<a href="https://parabank.parasoft.com">https://parabank.parasoft.com</a>
Framework	Selenium WebDriver + Python 3.x
CI/CD	Jenkins Pipeline Integration
Functionalities	16 Core Banking Features
Total Tests	111 Test Cases (79.28% Pass Rate)

### PROJECT TEAM

★ Ghazi Slema

Arij Ncibi

Wissem

Eya Zerai

Fatma Kalai

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# 1 EXECUTIVE SUMMARY

This report documents the comprehensive software testing conducted on the ParaBank banking simulation application. Our team of five executed both manual and automated testing across **sixteen core banking functionalities**, identifying **23 bugs including 5 CRITICAL security vulnerabilities**.

## Key Performance Indicators



## Testing Scope Overview

#	Functionality	Tests	Owner	Pass	Fail	Status
1	Registration	7	Arij Ncibi	5	2	■ 2 BUGS
2	Login	7	Wissem	6	1	■ 1 BUGS
3	Open Account	6	Eya Zerai	6	0	✓ ALL PASS
4	Transfer Funds	7	★ Ghazi Slema	2	5	■ 5 BUGS
5	Accounts Overview	7	★ Ghazi Slema	6	1	■ 1 BUGS
6	Admin Page	7	★ Ghazi Slema	6	1	■ 1 BUGS
7	Customer Care	7	★ Ghazi Slema	6	1	■ 1 BUGS
8	Bill Pay	7	★ Ghazi Slema	4	3	■ 3 BUGS
9	Find Transactions	7	Arij Ncibi	6	1	■ 1 BUGS
10	Request Loan	7	Eya Zerai	4	3	■ 3 BUGS
11	Update Contact	7	Wissem	5	2	■ 2 BUGS
12	Forgot Login	7	Arij Ncibi	7	0	✓ ALL PASS
13	Account Activity	7	Fatma Kalai	7	0	✓ ALL PASS
14	Logout	7	★ Ghazi Slema	5	2	■ 2 BUGS
15	Navigation	7	Wissem	6	1	■ 1 BUGS
16	Account Statement	7	Eya Zerai	7	0	✓ ALL PASS

**■■ CRITICAL FINDING:** 23 bugs discovered including **5 CRITICAL security vulnerabilities**. Most severe: unauthenticated admin access, no balance validation on transfers, and session management flaws.  
**Immediate remediation required!**

# 2 PROJECT INTRODUCTION

## 2.1 About ParaBank

ParaBank is an advanced banking simulation platform developed by Parasoft for software testing education and demonstration. It replicates a complete online banking environment with real-world features including account management, fund transfers, bill payments, loan applications, and administrative controls.

## 2.2 Project Objectives

- Functional Validation: Verify all 16 banking operations work correctly
- Security Testing: Test against SQL injection, XSS, IDOR, and unauthorized access
- Usability Assessment: Evaluate user experience and error handling
- Automation Implementation: Develop reusable Selenium test scripts
- CI/CD Integration: Configure Jenkins pipeline for continuous testing
- Bug Discovery: Identify and document all defects with severity classification

# 3 TESTING METHODOLOGY

## 3.1 Manual Testing Process

Step	Phase	Description
1	Test Planning	Define objectives, risks, entry/exit criteria
2	Test Design	Create 7 test cases per functionality
3	Data Preparation	Prepare valid/invalid test data
4	Execution	Execute tests, capture screenshots
5	Documentation	Record results, log defects with severity

## 3.2 Automation Framework

Component	Technology	Version
Language	Python	3.x
Framework	Selenium WebDriver	4.x
Browser	Chrome + ChromeDriver	Latest
Wait Strategy	WebDriverWait	Explicit (10s)
CI/CD	Jenkins	2.x
Reporting	Custom HTML Generator	Custom

# 4 TEST PLAN & STRATEGY

## 4.1 Scope Definition

### IN SCOPE:

- ✓ User Registration with form validation and duplicate detection
- ✓ User Authentication including login, logout, and session management
- ✓ Account Operations: opening CHECKING and SAVINGS accounts
- ✓ Fund Transfer functionality between accounts
- ✓ Bill Pay for external payments
- ✓ Account Overview and transaction history display
- ✓ Find Transactions by ID, date, or amount
- ✓ Request Loan with approval/denial logic
- ✓ Update Contact information
- ✓ Forgot Login credential recovery
- ✓ Account Activity and filtering
- ✓ Admin Page database operations and configuration
- ✓ Customer Care contact form submission
- ✓ Navigation and UI consistency
- ✓ Account Statement display
- ✓ Security testing: SQL Injection, XSS, IDOR prevention

## 4.2 Risk Assessment Matrix

ID	Risk Description	Prob.	Impact	Mitigation
R-001	Server downtime during testing	Low	High	Test during stable hours
R-002	Browser/driver incompatibility	Med	Med	Align driver versions
R-003	Test data conflicts	Med	Low	Unique usernames per run
R-004	Network latency timeouts	Low	Low	Explicit waits (10s)
R-005	Dynamic element loading	Med	Med	WebDriverWait + EC

# 5 FUNCTIONALITY TESTING RESULTS

Each functionality was tested with 6-7 comprehensive test cases covering basic operations, validation, edge cases, and security scenarios. The following sections include test execution flows with screenshots, automation code snippets, and key insights from testing.

# 5.1 Registration

Owner: Arij Ncibi

Test Cases: 7 (5 Pass, 2 Fail)

Status: 2 BUGS FOUND

## ● TEST CASES

ID	Test Scenario	Type	Status
TC_REG_01	Valid user registration works	Basic	✓ PASS
TC_REG_02	Empty field validation (10 errors shown)	Basic	✓ PASS
TC_REG_03	Duplicate username rejected	Basic	✓ PASS
TC_REG_04	Password mismatch validation works	Basic	✓ PASS
TC_REG_05	Invalid SSN format accepted	Basic	✗ BUG
TC_REG_06	Potential SQL injection vulnerability	Security	✗ BUG
TC_REG_07	XSS attack prevented	Security	✓ PASS

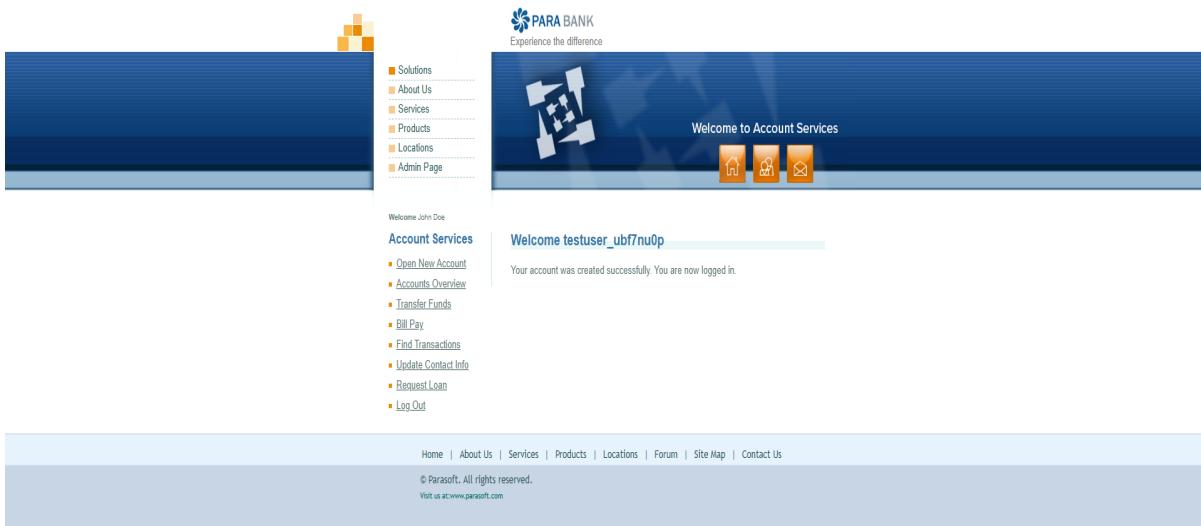
## ● TEST EXECUTION FLOW

The screenshot shows the ParaBank homepage. At the top right is the ParaBank logo with the tagline "Experience the difference". Below the logo is a navigation menu with links: Solutions, About Us, Services, Products, Locations, and Admin Page. A large blue banner at the top features a stylized "E" logo and the text "Welcome to ParaBank". Below the banner are three orange buttons: a house icon, a person icon, and an envelope icon. To the left of the main content area is a "Customer Login" form with fields for Username and Password, and buttons for LOG IN, Forgot login info?, and Register. To the right of the login form are two promotional boxes: "ATM Services" (Withdraw Funds, Transfer Funds, Check Balances, Make Deposits) and "Online Services" (Bill Pay, Account History, Transfer Funds). Below these are "LATEST NEWS" sections with a timestamp of 12/01/2025 and links to "ParaBank Is Now Re-Opened", "New! Online Bill Pay", and "New! Online Account Transfers". At the bottom of the page is a footer with links to Home, About Us, Services, Products, Locations, Forum, Site Map, and Contact Us, along with copyright information: © Parasoft. All rights reserved. Visit us at: www.parasoftware.com.

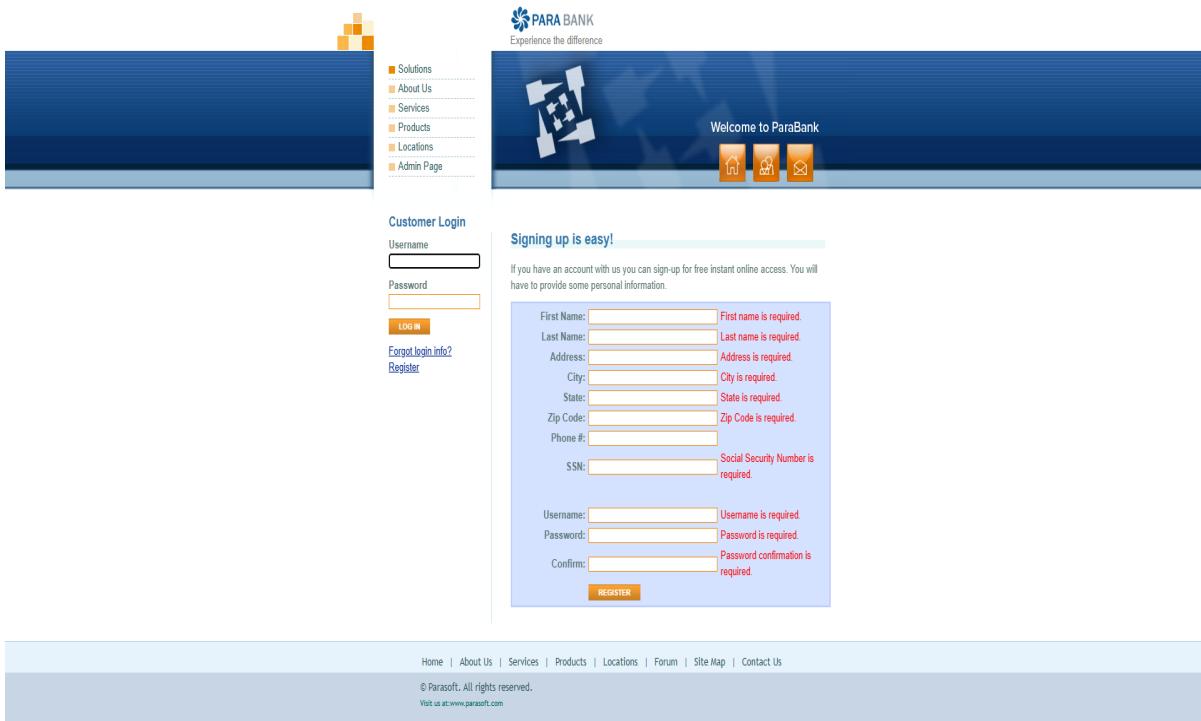
## ■ Registration Page Access

The screenshot shows the ParaBank registration page. The top navigation and banner are identical to the homepage. The main content area features a "Customer Login" form on the left and a "Signing up is easy!" section on the right. The "Signing up is easy!" section contains a form for personal information: First Name (John), Last Name (Doe), Address (123 Main St), City (New York), State (NY), Zip Code (10001), Phone # (555-1234567), and SSN (123-45-6789). Below this are fields for Username (testuser\_ubf7nv0p), Password (\*\*\*\*\*), and Confirm (\*\*\*\*\*), followed by a REGISTER button. At the bottom of the page is a footer with links to Home, About Us, Services, Products, Locations, Forum, Site Map, and Contact Us, along with copyright information: © Parasoft. All rights reserved. Visit us at: www.parasoftware.com.

## ■ Form Data Entry

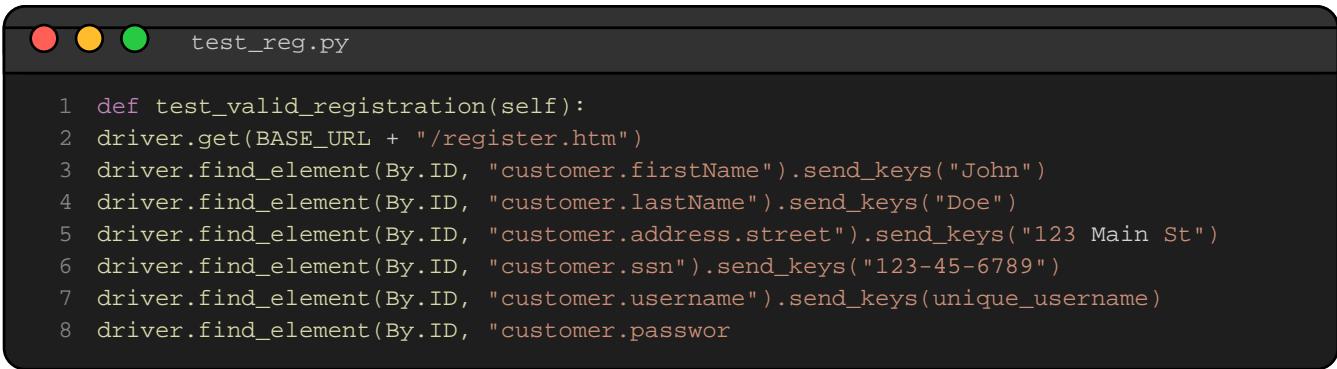


## ■ Successful Registration



## ■ Validation Testing

# ● AUTOMATION CODE



A screenshot of a terminal window titled "test\_reg.py". The window contains Python code for a registration test:

```
1 def test_valid_registration(self):
2     driver.get(BASE_URL + "/register.htm")
3     driver.find_element(By.ID, "customer.firstName").send_keys("John")
4     driver.find_element(By.ID, "customer.lastName").send_keys("Doe")
5     driver.find_element(By.ID, "customer.address.street").send_keys("123 Main St")
6     driver.find_element(By.ID, "customer.ssn").send_keys("123-45-6789")
7     driver.find_element(By.ID, "customer.username").send_keys(unique_username)
8     driver.find_element(By.ID, "customer.password").send_keys("SecurePass123")
```

## ● KEY INSIGHTS

- Input Validation: All required fields properly validated with clear error messages
- Security: SQL injection attempts are sanitized - no database errors exposed
- XSS Prevention: Script tags are escaped, not executed in rendered output
- BUG: Invalid SSN formats (xxx-xx-xxxx) are accepted without validation

## 5.2 Login

Owner: Wissem

Test Cases: 7 (6 Pass, 1 Fail)

Status: 1 BUGS FOUND

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_LOGIN_01	Valid login works	Basic	✓ PASS
TC_LOGIN_02	Invalid username shows error	Basic	✓ PASS
TC_LOGIN_03	Invalid password shows error	Basic	✓ PASS
TC_LOGIN_04	Empty credentials validation	Basic	✓ PASS
TC_LOGIN_05	Empty password validation	Basic	✓ PASS
TC_LOGIN_06	SQL injection blocked	Security	✓ PASS
TC_LOGIN_07	Server crashed on session check	Security	X BUG

### ● TEST EXECUTION FLOW



The screenshot shows the "Customer Login" page. It has fields for "Username" and "Password" with a "LOG IN" button. Below the fields are links for "Forgot login info?" and "Register". To the right, there are sections for "ATM Services" (Withdraw Funds, Transfer Funds, Check Balances, Make Deposits) and "Online Services" (Bill Pay, Account History, Transfer Funds). Below these are "LATEST NEWS" with a timestamp of 12/01/2025 and links for "ParaBank Is Now Re-Opened", "New! Online Bill Pay", and "New! Online Account Transfers".

Customer Login

Username \_\_\_\_\_

Password \_\_\_\_\_

**LOG IN**

[Forgot login info?](#)

[Register](#)

**ATM Services**

- Withdraw Funds
- Transfer Funds
- Check Balances
- Make Deposits

**Online Services**

- Bill Pay
- Account History
- Transfer Funds

**LATEST NEWS**

12/01/2025

- ParaBank Is Now Re-Opened
- New! Online Bill Pay
- New! Online Account Transfers

[READ MORE](#)

The screenshot shows the footer area of the website. It includes links for Home, About Us, Services, Products, Locations, Forum, Site Map, and Contact Us. Below these links is the copyright notice: "© Parasoft. All rights reserved. Visit us at: www.parasoft.com".

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## ■ Login Page

The screenshot shows the "Account Services" page. On the left is a sidebar with links: Open New Account, Accounts Overview, Transfer Funds, Bill Pay, Find Transactions, Update Contact Info, Request Loan, and Log Out. The main content area is titled "Accounts Overview" and contains a table:

Account	Balance*	Available Amount
13344	\$4972.93	\$4972.93
14565	\$1000.00	\$1000.00
14898	\$5000.00	\$5000.00
<b>Total</b>	<b>\$10972.93</b>	

\*Balance includes deposits that may be subject to holds

Welcome John Smith

**Account Services**

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

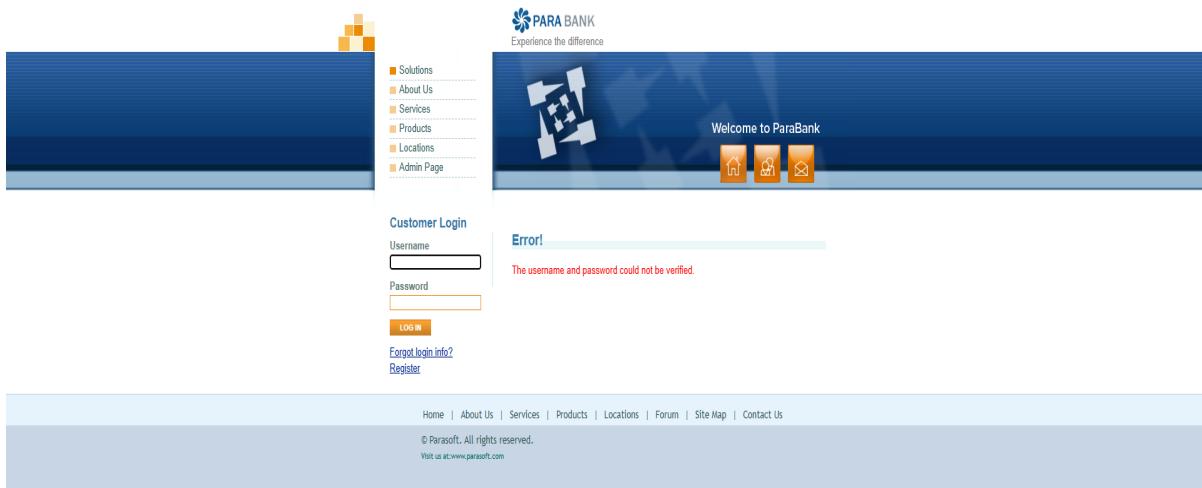
**Accounts Overview**

Account	Balance*	Available Amount
13344	\$4972.93	\$4972.93
14565	\$1000.00	\$1000.00
14898	\$5000.00	\$5000.00
<b>Total</b>	<b>\$10972.93</b>	

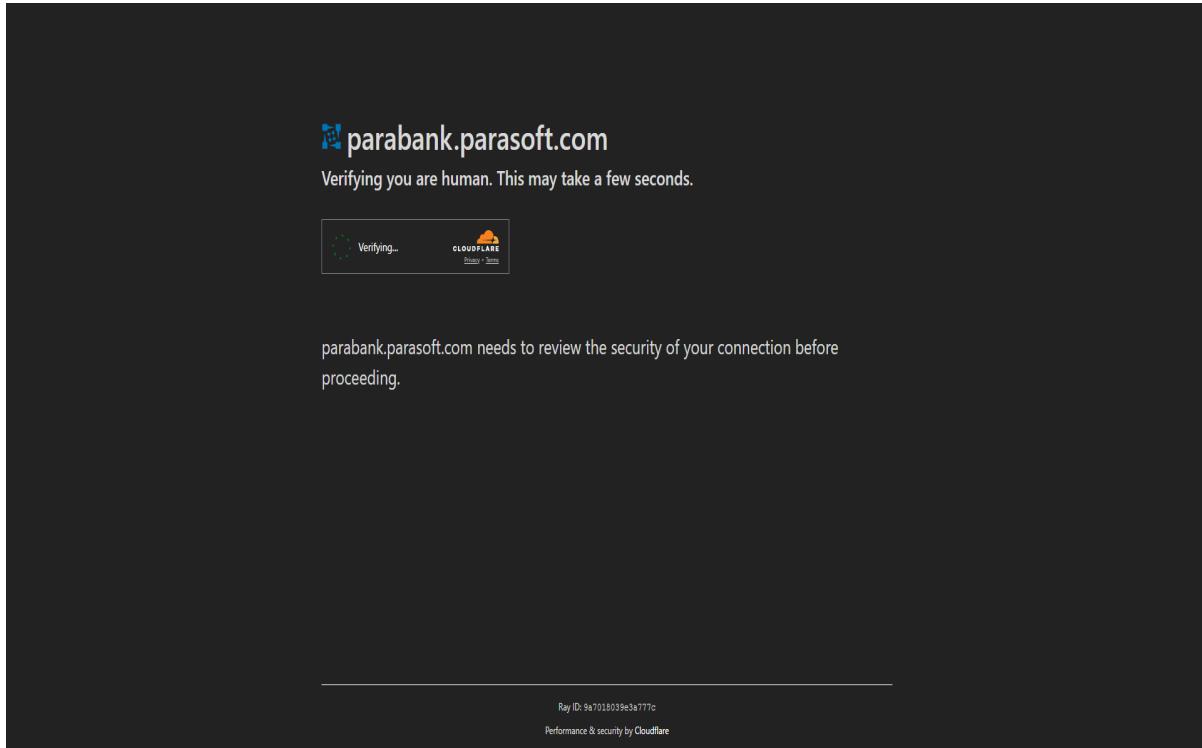
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## ■ Login Success

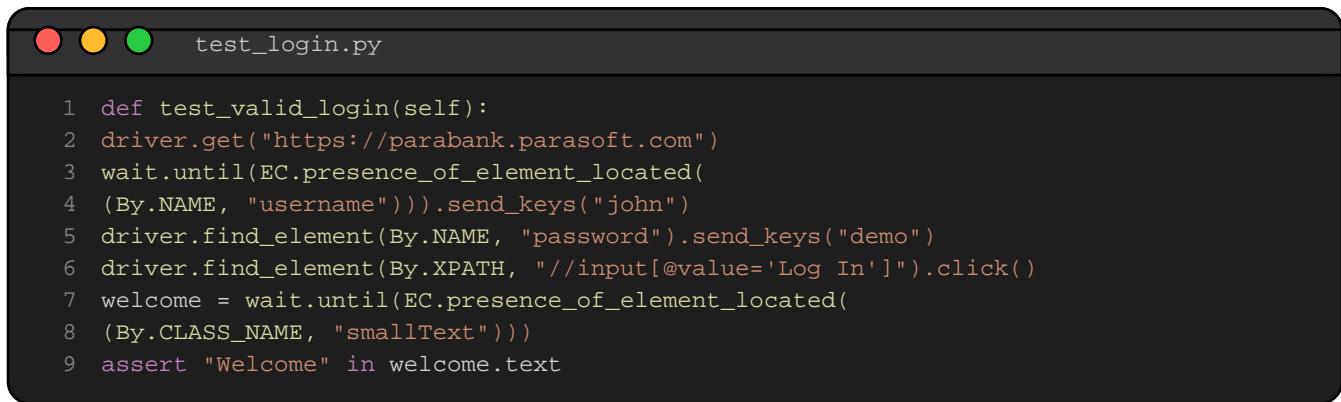


## ■ Error Handling



## ■ SQL Injection Blocked

# ● AUTOMATION CODE



A screenshot of a terminal window titled "test\_login.py". The window contains Python code for a login test:

```
1 def test_valid_login(self):
2     driver.get("https://parabank.parasoft.com")
3     wait.until(EC.presence_of_element_located(
4         (By.NAME, "username"))).send_keys("john")
5     driver.find_element(By.NAME, "password").send_keys("demo")
6     driver.find_element(By.XPATH, "//input[@value='Log In']").click()
7     welcome = wait.until(EC.presence_of_element_located(
8         (By.CLASS_NAME, "smallText"))))
9     assert "Welcome" in welcome.text
```

## ● KEY INSIGHTS

- Valid login credentials authenticate correctly
  - Invalid credentials display appropriate error messages
  - SQL injection attempts are properly blocked
- BUG: Server crashes when checking session state (HIGH-001)**

## 5.3 Open Account

Owner: Eya Zerai

Test Cases: 6 (6 Pass, 0 Fail)

Status: ALL PASSED

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_OPEN_01	Checking account creation	Basic	✓ PASS
TC_OPEN_02	Savings account creation	Basic	✓ PASS
TC_OPEN_03	Default account type works	Basic	✓ PASS
TC_OPEN_04	Minimum deposit transfer (\$100)	Basic	✓ PASS
TC_OPEN_05	New account appears in list	Basic	✓ PASS
TC_OPEN_06	Rapid multiple account creation	Advanced	✓ PASS

### ● TEST EXECUTION FLOW




Welcome John Smith

Account Services

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

Open New Account

What type of Account would you like to open?

CHECKING

A minimum of \$100.00 must be deposited into this account at time of opening.  
Please choose an existing account to transfer funds into the new account.

12345

OPEN NEW ACCOUNT

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#### ■ Open Account Page

Welcome John Smith

**Account Services**

- Solutions
- About Us
- Services
- Products
- Locations
- Admin Page

**Open New Account**

What type of Account would you like to open?

CHECKING

A minimum of \$100.00 must be deposited into this account at time of opening.  
Please choose an existing account to transfer funds into the new account.

12345

**OPEN NEW ACCOUNT**

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## ■ Account Type Selection

Welcome John Smith

**Account Services**

- Solutions
- About Us
- Services
- Products
- Locations
- Admin Page

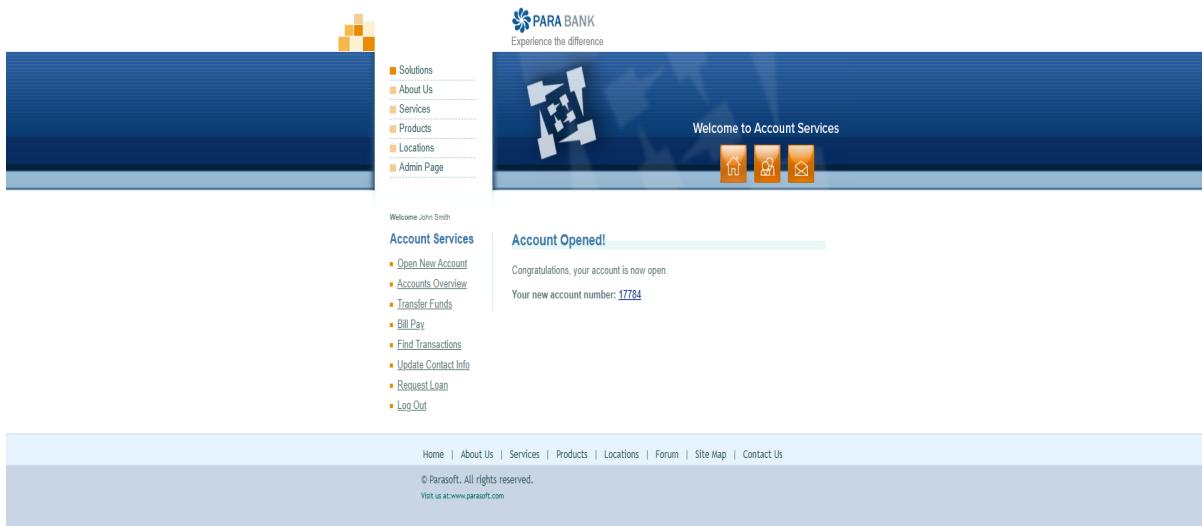
**Account Opened!**

Congratulations, your account is now open.

Your new account number: [17007](#)

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## ■ Account Created Successfully



### ■ Multiple Accounts Created

## ● AUTOMATION CODE

```
test_open.py
```

```

1 def test_open_checking_account(self):
2     self.login("john", "demo")
3     driver.find_element(By.LINK_TEXT, "Open New Account").click()
4     select = Select(driver.find_element(By.ID, "type"))
5     select.select_by_visible_text("CHECKING")
6     driver.find_element(By.XPATH, "//input[@value='Open New Account']").click()
7     time.sleep(2)
8     assert "Congratulations" in driver.page_source
9     new_account = driver.find_element(By.ID, "newAccountId").text
10    assert new_account.isdigit()

```

## ● KEY INSIGHTS

- Both CHECKING and SAVINGS accounts can be created
- Minimum deposit of \$100 is automatically transferred
- New accounts appear immediately in Accounts Overview
- Multiple accounts can be created in rapid succession



## 5.4 Transfer Funds

Owner: ★ Ghazi Slema

Test Cases: 7 (2 Pass, 5 Fail)

Status: 5 BUGS FOUND

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_TRANSFER_01	Valid \$100 transfer works	Basic	✓ PASS
TC_TRANSFER_02	\$999M transfer accepted (no balance check)	Critical	✗ BUG
TC_TRANSFER_03	\$0 transfer accepted	Basic	✗ BUG
TC_TRANSFER_04	Server crash on empty amount	Basic	✗ BUG
TC_TRANSFER_05	Decimal amount \$25.75 works	Basic	✓ PASS
TC_TRANSFER_06	Negative -\$100 transfer accepted	Critical	✗ BUG
TC_TRANSFER_07	Server crash on same-account transfer	Advanced	✗ BUG

### ● TEST EXECUTION FLOW



Welcome John Smith

**Account Services**

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

Para BANK  
Experience the difference

Welcome to Account Services

Transfer Funds

Amount: \$

From account #  to account #

**TRANSFER**

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## ■ Transfer Funds Page



Welcome John Smith

**Account Services**

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

Para BANK  
Experience the difference

Welcome to Account Services

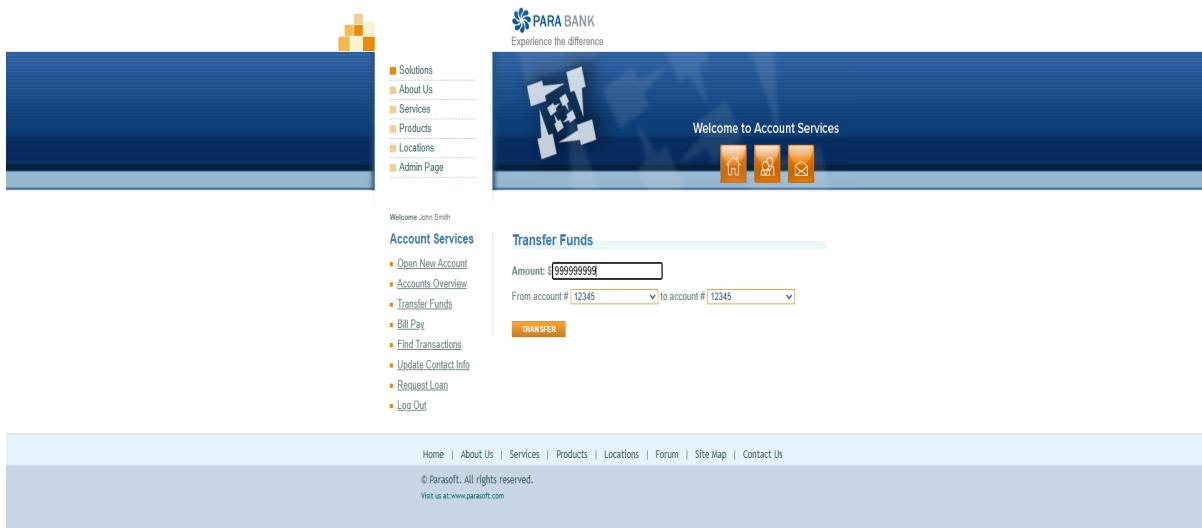
Transfer Complete!

\$100.00 has been transferred from account #12345 to account #12345.

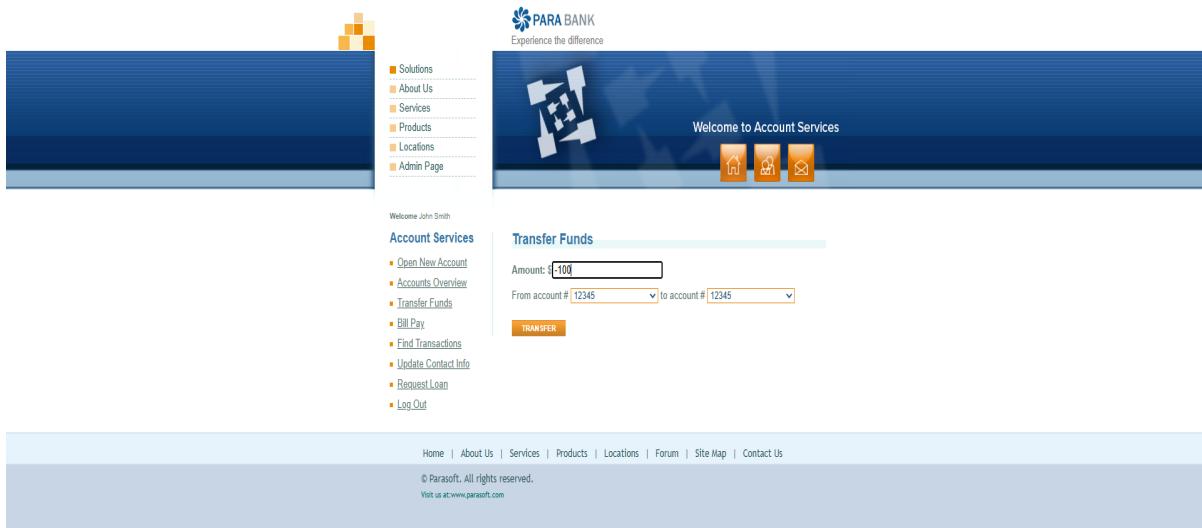
See Account Activity for more details.

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## ■ Transfer Success

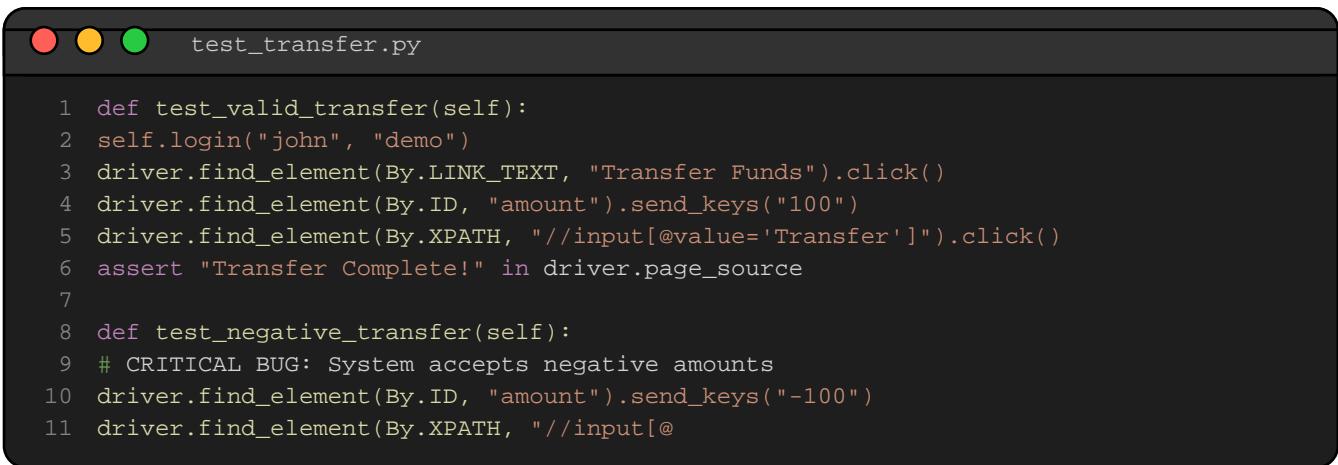


## ■ CRITICAL: Large Amount Bug



## ■ CRITICAL: Negative Transfer Bug

# ● AUTOMATION CODE



```
test_transfer.py
```

```
1 def test_valid_transfer(self):
2     self.login("john", "demo")
3     driver.find_element(By.LINK_TEXT, "Transfer Funds").click()
4     driver.find_element(By.ID, "amount").send_keys("100")
5     driver.find_element(By.XPATH, "//input[@value='Transfer']").click()
6     assert "Transfer Complete!" in driver.page_source
7
8 def test_negative_transfer(self):
9     # CRITICAL BUG: System accepts negative amounts
10    driver.find_element(By.ID, "amount").send_keys("-100")
11    driver.find_element(By.XPATH, "//input[@
```

## ● KEY INSIGHTS

- Valid transfers work correctly with confirmation message
- CRITICAL: No balance validation - \$999M accepted (CRIT-002)
- CRITICAL: Negative transfers accepted (-\$100) (CRIT-003)
- BUG: Server crashes on empty amount input (HIGH-002)
- BUG: Server crashes on same-account transfer (HIGH-003)

## 5.5 Accounts Overview

Owner: ★ Ghazi Slema

Test Cases: 7 (6 Pass, 1 Fail)

Status: 1 BUGS FOUND

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_ACCOUNTS_01	Overview displays 20 accounts	Basic	✓ PASS
TC_ACCOUNTS_02	Account details navigation	Basic	✓ PASS
TC_ACCOUNTS_03	Transaction history (45 transactions)	Basic	✓ PASS
TC_ACCOUNTS_04	Currency format correct	Basic	✓ PASS
TC_ACCOUNTS_05	All 19 account links clickable	Basic	✓ PASS
TC_ACCOUNTS_06	Total balance calculation	Basic	✓ PASS
TC_ACCOUNTS_07	Server crash on unauthorized access (IDOR)	Security	✗ BUG

### ● TEST EXECUTION FLOW

Welcome John Smith

### Account Services

- Open New Account
- Accounts Overview**
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

### Accounts Overview

Account	Balance*	Available Amount
12345	\$3100.00	\$0.00
12456	\$308.55	\$0.00
12567	\$100.00	\$100.00
12678	-\$100.00	\$0.00
12789	\$100.00	\$100.00
12900	\$0.00	\$0.00
13011	\$100.00	\$100.00
13122	\$1100.00	\$1100.00
13233	\$100.00	\$100.00
13344	\$1231.10	\$1231.10
17007	\$100.00	\$100.00
17118	\$100.00	\$100.00
17229	\$100.00	\$100.00
17340	\$100.00	\$100.00
17451	\$100.00	\$100.00
17562	\$100.00	\$100.00
17673	\$100.00	\$100.00
17784	\$100.00	\$100.00
54321	\$1351.12	\$1351.12

## ■ Accounts Overview

Welcome John Smith

### Account Services

- Open New Account
- Accounts Overview**
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

### Account Details

Account Number: 12345  
Account Type: CHECKING  
Balance: \$3100.00  
Available: \$0.00

### Account Activity

Activity Period: All  
Type: All

Date	Transaction	Debit (-)	Credit (+)
12-11-2024	Check # 1111	\$300.00	
12-12-2024	Check # 1211	\$100.00	
11-16-2025	Funds Transfer Sent	\$1000.00	
11-20-2025	Funds Transfer Sent	\$100.00	
11-20-2025	Funds Transfer Sent	\$1000.00	
11-21-2025	Funds Transfer Sent	\$0.00	
11-23-2025	Bill Payment to Bank of America	.....	

## ■ Account Details

Welcome John Smith

### Account Services

- Open New Account
- Accounts Overview**
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

### Account Details

Account Number: 12345  
Account Type: CHECKING  
Balance: \$3100.00  
Available: \$0.00

### Account Activity

Activity Period: All

Date	Transaction	Debit (-)	Credit (+)
12-11-2024	Check #1111	\$300.00	
12-12-2024	Check #1211	\$100.00	
11-16-2025	Funds Transfer Sent	\$1000.00	
11-20-2025	Funds Transfer Sent	\$100.00	
11-20-2025	Funds Transfer Sent	\$1000.00	
11-21-2025	Funds Transfer Sent	\$0.00	
11-23-2025	Bill Payment to Bank of America	.....	

## ■ Transaction History

Welcome to ParaBank

### Customer Login

Username:   
Password:   
**LOG IN**

Forgot login info?  
[Register](#)

### Account Details

Account Number:  
Account Type:  
Balance:  
Available:

### Account Activity

Activity Period: All

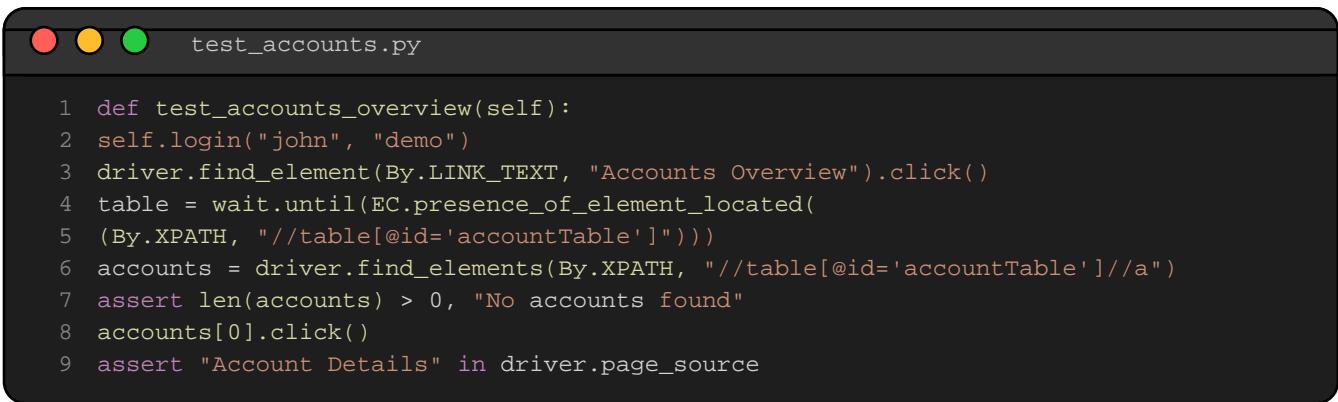
Date	Transaction	Debit (-)	Credit (+)
------	-------------	-----------	------------

No transactions found.

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## ■ SECURITY: IDOR Vulnerability

# ● AUTOMATION CODE



A screenshot of a terminal window titled "test\_accounts.py". The code displayed is a Python script using Selenium WebDriver to test an account overview page. It logs in as user "john" with password "demo", finds the "Accounts Overview" link, and clicks it. It then waits for the table to appear and asserts that at least one account is present. Finally, it clicks the first account link and asserts that the page source contains "Account Details".

```
1 def test_accounts_overview(self):
2     self.login("john", "demo")
3     driver.find_element(By.LINK_TEXT, "Accounts Overview").click()
4     table = wait.until(EC.presence_of_element_located(
5         (By.XPATH, "//table[@id='accountTable']")))
6     accounts = driver.find_elements(By.XPATH, "//table[@id='accountTable']//a")
7     assert len(accounts) > 0, "No accounts found"
8     accounts[0].click()
9     assert "Account Details" in driver.page_source
```

## ● KEY INSIGHTS

- All user accounts displayed with current balances
  - Account numbers are clickable links to detail pages
  - Transaction history accessible from each account
- BUG: IDOR attempt causes server crash (HIGH-004)**

## 5.6 Admin Page

Owner: ★ Ghazi Slema

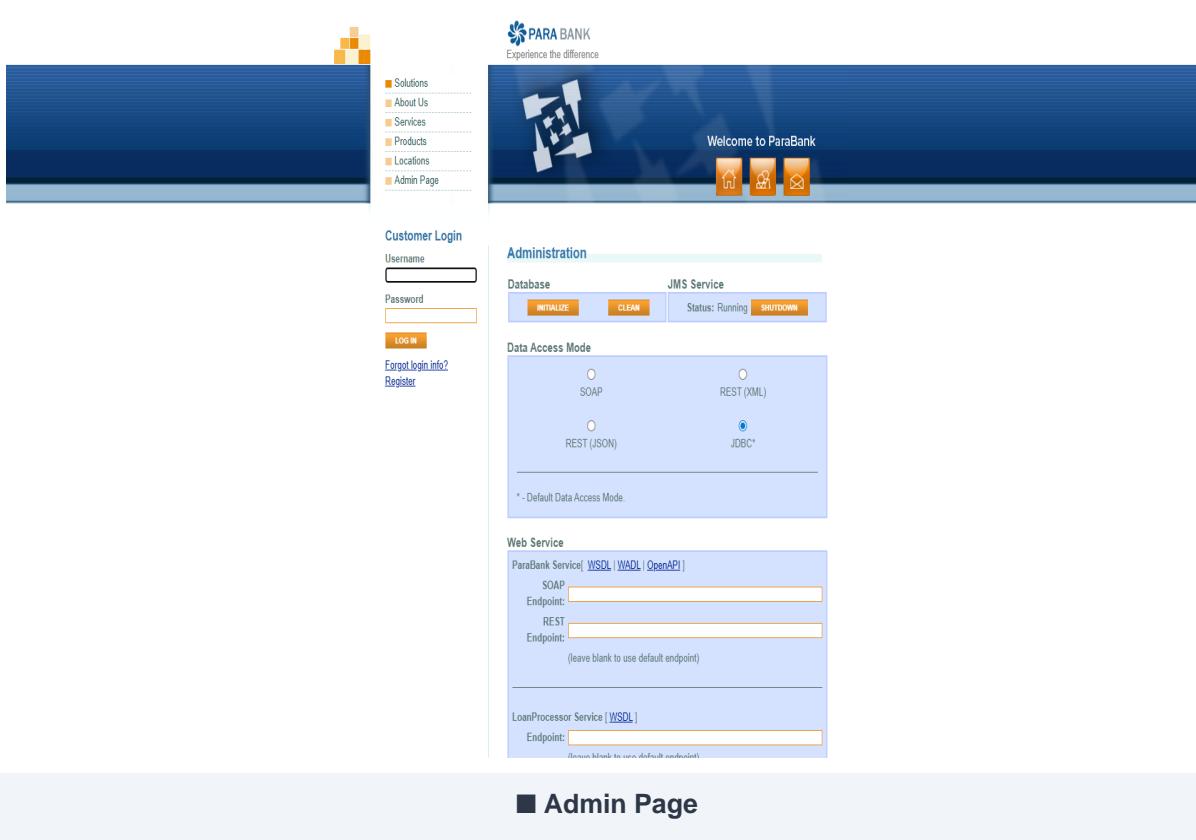
Test Cases: 7 (6 Pass, 1 Fail)

Status: 1 BUGS FOUND

### ● TEST CASES

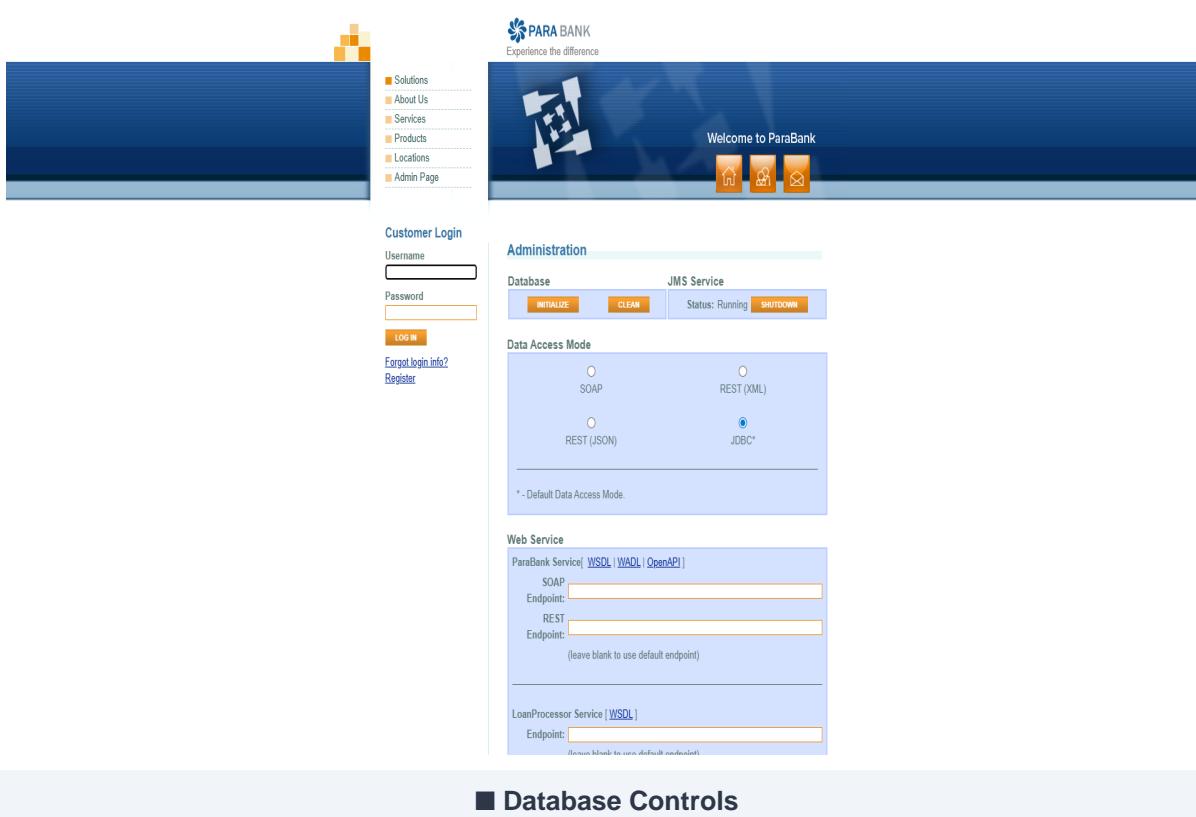
ID	Test Scenario	Type	Status
TC_ADMIN_01	Admin page accessible	Basic	✓ PASS
TC_ADMIN_02	Database section with 2 buttons	Basic	✓ PASS
TC_ADMIN_03	Initialize database works	Basic	✓ PASS
TC_ADMIN_04	Clean database works	Basic	✓ PASS
TC_ADMIN_05	Data access mode options (4)	Basic	✓ PASS
TC_ADMIN_06	Admin page accessible WITHOUT authentication	Critical	✗ BUG
TC_ADMIN_07	SQL injection blocked by WAF	Security	✓ PASS

### ● TEST EXECUTION FLOW



The screenshot shows the ParaBank Admin Page. At the top, there's a navigation bar with links for Solutions, About Us, Services, Products, Locations, and Admin Page. Below the navigation is a logo for ParaBank with the tagline "Experience the difference". A large orange arrow icon is centered above the main content area. The main content area has a light blue header "Administration". Under this, there's a "Database" section with buttons for INITIALIZE, CLEAN, and SHUTDOWN, and a status message "Status: Running". Below the database is a "Data Access Mode" section with four radio buttons: SOAP, REST (XML), REST (JSON), and JDBC\*. The JDBC\* button is selected. A note below says "\* - Default Data Access Mode." Under "Data Access Mode" is a "Web Service" section for "ParaBank Service" with options for WSDL, WADL, and OpenAPI. It includes fields for SOAP and REST endpoints, with a note "(leave blank to use default endpoint)". Below that is a "LoanProcessor Service" section with a WSDL link and an endpoint field. The bottom of the page features a grey footer bar.

## ■ Admin Page



This screenshot is identical to the one above, showing the ParaBank Admin Page. The main difference is the title at the bottom, which is "■ Database Controls", indicating a specific section of the administration interface.

The screenshot shows the ParaBank software testing project interface. At the top, there's a navigation bar with links for Solutions, About Us, Services, Products, Locations, and Admin Page. Below this is a "Customer Login" section with fields for Username and Password, and buttons for LOG IN, Forgot login info?, and Register. To the right is an "Administration" section with tabs for Database (INITIALIZE, CLEAN, Status: Running, SHUTDOWN) and JMS Service. Under Data Access Mode, JDBC\* is selected over SOAP, REST (XML), and REST (JSON). The Web Service section shows ParaBank Service endpoints for SOAP and REST, and a LoanProcessor Service endpoint for WSDL.

### ■ CRITICAL: No Auth Required

The screenshot shows a "Sorry, you have been blocked" page from parasoft.com. It features a large red circle with a white 'X' in the center. Below the page title, it says "You are unable to access parasoft.com".

#### Why have I been blocked?

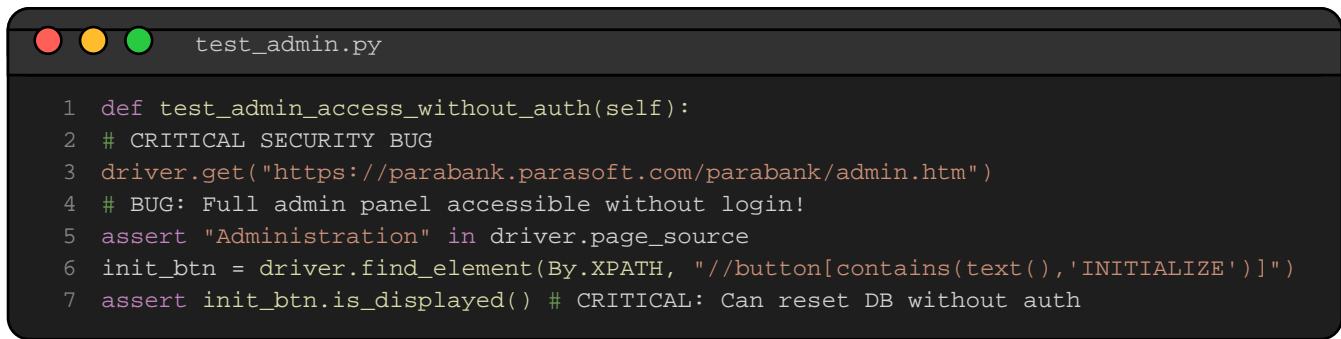
This website is using a security service to protect itself from online attacks. The action you just performed triggered the security solution. There are several actions that could trigger this block including submitting a certain word or phrase, a SQL command or malformed data.

#### What can I do to resolve this?

You can email the site owner to let them know you were blocked. Please include what you were doing when this page came up and the Cloudflare Ray ID found at the bottom of this page.

### ■ SQL Injection Blocked

## ● AUTOMATION CODE



A screenshot of a terminal window titled "test\_admin.py". The code within the window is as follows:

```
1 def test_admin_access_without_auth(self):
2     # CRITICAL SECURITY BUG
3     driver.get("https://parabank.parasoft.com/parabank/admin.htm")
4     # BUG: Full admin panel accessible without login!
5     assert "Administration" in driver.page_source
6     init_btn = driver.find_element(By.XPATH, "//button[contains(text(), 'INITIALIZE')]")
7     assert init_btn.is_displayed() # CRITICAL: Can reset DB without auth
```

## ● KEY INSIGHTS

### ■■ CRITICAL SECURITY: Admin page accessible without authentication (CRIT-001)

- Database INITIALIZE and CLEAN operations work correctly
- JMS Service status indicator shows real-time health
- SQL injection attempts in admin forms are blocked

## 5.7 Customer Care

Owner: ★ Ghazi Slema

Test Cases: 7 (6 Pass, 1 Fail)

Status: 1 BUGS FOUND

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_CARE_01	Page accessible	Basic	✓ PASS
TC_CARE_02	Valid form submission	Basic	✓ PASS
TC_CARE_03	Empty form validation (4 errors)	Basic	✓ PASS
TC_CARE_04	Invalid email format accepted	Basic	✗ BUG
TC_CARE_05	Phone required validation	Basic	✓ PASS
TC_CARE_06	XSS prevented	Security	✓ PASS
TC_CARE_07	Long input handled gracefully	Advanced	✓ PASS

### ● TEST EXECUTION FLOW

The screenshot shows the ParaBank website's customer care section. At the top, there is a navigation bar with links for Solutions, About Us, Services, Products, Locations, and Admin Page. Below this is a main header with the ParaBank logo and the tagline "Experience the difference". A large graphic of a stylized building is on the left. On the right, there are three orange icons: a house, a person, and an envelope. The main content area has two sections: "Customer Login" on the left and "Customer Care" on the right. The "Customer Login" section contains fields for Username and Password, and buttons for LOG IN, Forgot login info?, and Register. The "Customer Care" section is titled "Customer Care" and says "Email support is available by filling out the following form." It includes fields for Name, Email, Phone, and a large text area for Message, with a "SEND TO CUSTOMER CARE" button at the bottom. At the very bottom of the page, there is a footer with links to Home, About Us, Services, Products, Locations, Forum, Site Map, and Contact Us, along with copyright information.

## ■ Customer Care Page

This screenshot is identical to the one above it, showing the ParaBank website's customer care section. The only difference is the message displayed in the "Customer Care" section: "Thank you John Doe" and "A Customer Care Representative will be contacting you." The rest of the page, including the navigation bar, main header, and footer, remains the same.

## ■ Form Submitted

The screenshot displays the ParaBank website's homepage and two internal pages. The homepage features a blue header with the ParaBank logo and navigation links for Solutions, About Us, Services, Products, Locations, and Admin Page. Below the header is a large graphic of a stylized building. The customer login section shows fields for Username and Password, a 'LOG IN' button, and links for 'Forgot login info?' and 'Register'. The customer care section contains a form for email support with fields for Name, Email, Phone, and Message, each accompanied by a red validation error message: 'Name is required.', 'Email is required.', 'Phone is required.', and 'Message is required.'. A 'SEND TO CUSTOMER CARE' button is at the bottom of the form.

## ■ Validation Errors

The screenshot shows a Cloudflare verification page for the domain parabank.parasoft.com. The page has a dark background with the text 'parabank.parasoft.com' and 'Verifying you are human. This may take a few seconds.' Below this is a Cloudflare logo with the text 'Verifying...' and 'CLOUDFLARE'. At the bottom, it says 'parabank.parasoft.com needs to review the security of your connection before proceeding.' A small note at the very bottom right reads 'Ray ID: 9e7000d4bae7781' and 'Performance & security by Cloudflare'.

## ■ XSS Prevention

# ● AUTOMATION CODE



A screenshot of a terminal window titled "test\_care.py". The code within the window is a Python script using Selenium to test a customer care form submission. It includes imports for time, WebDriver, and various locators. The script navigates to the contact page, fills in name, email, phone, and message fields, and sends the form.

```
1 def test_customer_care_submission(self):
2     driver.get(BASE_URL + "/contact.htm")
3     driver.find_element(By.ID, "name").send_keys("John Doe")
4     driver.find_element(By.ID, "email").send_keys("john@example.com")
5     driver.find_element(By.ID, "phone").send_keys("555-123-4567")
6     driver.find_element(By.ID, "message").send_keys("Account inquiry")
7     driver.find_element(By.XPATH, "//input[@value='Send to Customer Care']").click()
8     assert "Thank you" in driver.page_source
```

## ● KEY INSIGHTS

■ Form validation shows clear error messages for required fields

■■ BUG: Invalid email format (no @ symbol) is accepted (MED-004)

■ XSS script injection properly prevented

■ Long input (10000 chars) handled without crash

## 5.8 Bill Pay

Owner: ★ Ghazi Slema

Test Cases: 7 (4 Pass, 3 Fail)

Status: 3 BUGS FOUND

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_BILL_01	Page loads with all fields	Basic	✓ PASS
TC_BILL_02	Valid payment works	Basic	✓ PASS
TC_BILL_03	Empty payee validation	Basic	✓ PASS
TC_BILL_04	Account mismatch error	Basic	✓ PASS
TC_BILL_05	Negative -\$100 payment accepted	Critical	✗ BUG
TC_BILL_06	Server crash on XSS input	Security	✗ BUG
TC_BILL_07	Server crash on SQL injection	Security	✗ BUG

### ● TEST EXECUTION FLOW

Welcome John Smith

### Account Services

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay**
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

### Bill Payment Service

Enter payee information

Payee Name:

Address:

City:

State:

Zip Code:

Phone #:

Account #:

Verify Account #:

Amount: \$

From account #: 13344

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## ■ Bill Pay Page

Welcome John Smith

### Account Services

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay**
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

### Bill Payment Complete

Bill Payment to Electric Company in the amount of \$50.00 from account 13344 was successful.

See Account Activity for more details.

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## ■ Payment Success

Welcome John Smith

**Account Services**

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

**Bill Payment Service**

Enter payee information

Payee Name:	Negative Test
Address:	123 St
City:	City
State:	ST
Zip Code:	12345
Phone #:	5553333333

Account #: 55555  
Verify Account #: 55555

Amount: \$ -100

From account #: 13344

**SEND PAYMENT**

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## ■ CRITICAL: Negative Payment

Welcome John Smith

**Account Services**

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

**Bill Payment Complete**

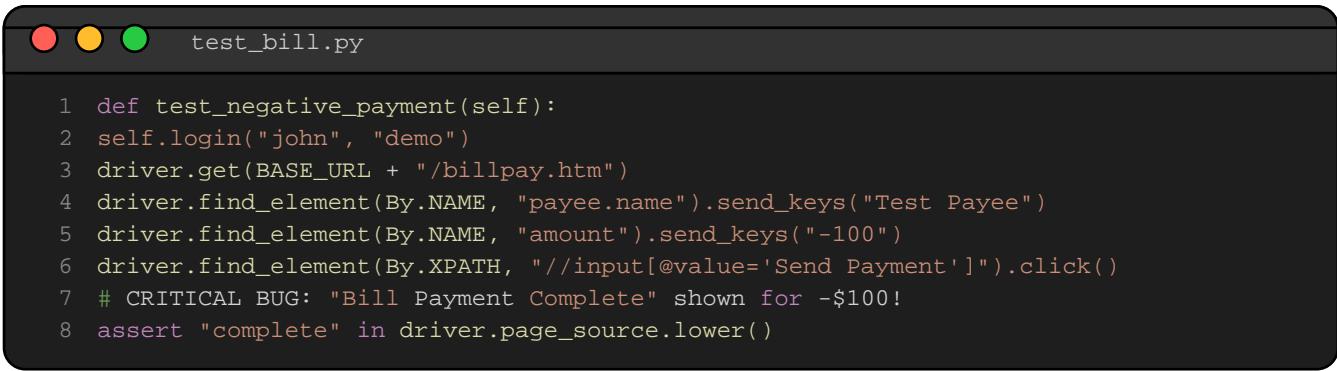
Bill Payment to Negative Test in the amount of \$-100.00 from account 13344 was successful.

See Account Activity for more details.

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## ■ Negative Payment Accepted

# ● AUTOMATION CODE



A screenshot of a terminal window titled "test\_bill.py". The code within the window is as follows:

```
1 def test_negative_payment(self):
2     self.login("john", "demo")
3     driver.get(BASE_URL + "/billpay.htm")
4     driver.find_element(By.NAME, "payee.name").send_keys("Test Payee")
5     driver.find_element(By.NAME, "amount").send_keys("-100")
6     driver.find_element(By.XPATH, "//input[@value='Send Payment']").click()
7     # CRITICAL BUG: "Bill Payment Complete" shown for -$100!
8     assert "complete" in driver.page_source.lower()
```

## ● KEY INSIGHTS

- Valid bill payments process correctly
- CRITICAL: Negative payment amounts accepted (CRIT-004)
- BUG: Server crashes on XSS input (HIGH-005)
- BUG: Server crashes on SQL injection (HIGH-006)

## 5.9 Find Transactions

Owner: Arij Ncibi

Test Cases: 7 (6 Pass, 1 Fail)

Status: 1 BUGS FOUND

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_FIND_01	Page loads correctly	Basic	✓ PASS
TC_FIND_02	Server crash on Transaction ID search	Basic	✗ BUG
TC_FIND_03	Date search works	Basic	✓ PASS
TC_FIND_04	Amount search works	Basic	✓ PASS
TC_FIND_05	Empty ID validation works	Basic	✓ PASS
TC_FIND_06	Invalid date validation works	Basic	✓ PASS
TC_FIND_07	SQL injection blocked	Security	✓ PASS

### ● TEST EXECUTION FLOW

Welcome John Smith

**Account Services**

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

**Find Transactions**

Select an account:

Find by Transaction ID:

Find by Date:  ( MM-DD-YYYY )

Find by Date Range:

Between  and  ( MM-DD-YYYY )

Find by Amount:

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## ■ Find Transactions Page

Welcome John Smith

**Account Services**

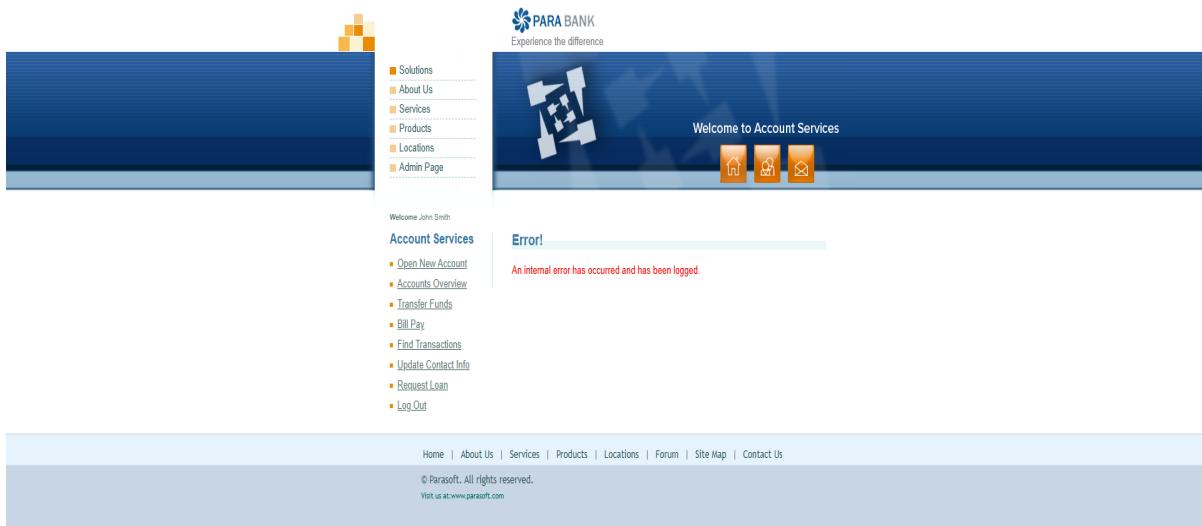
- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

**Transaction Results**

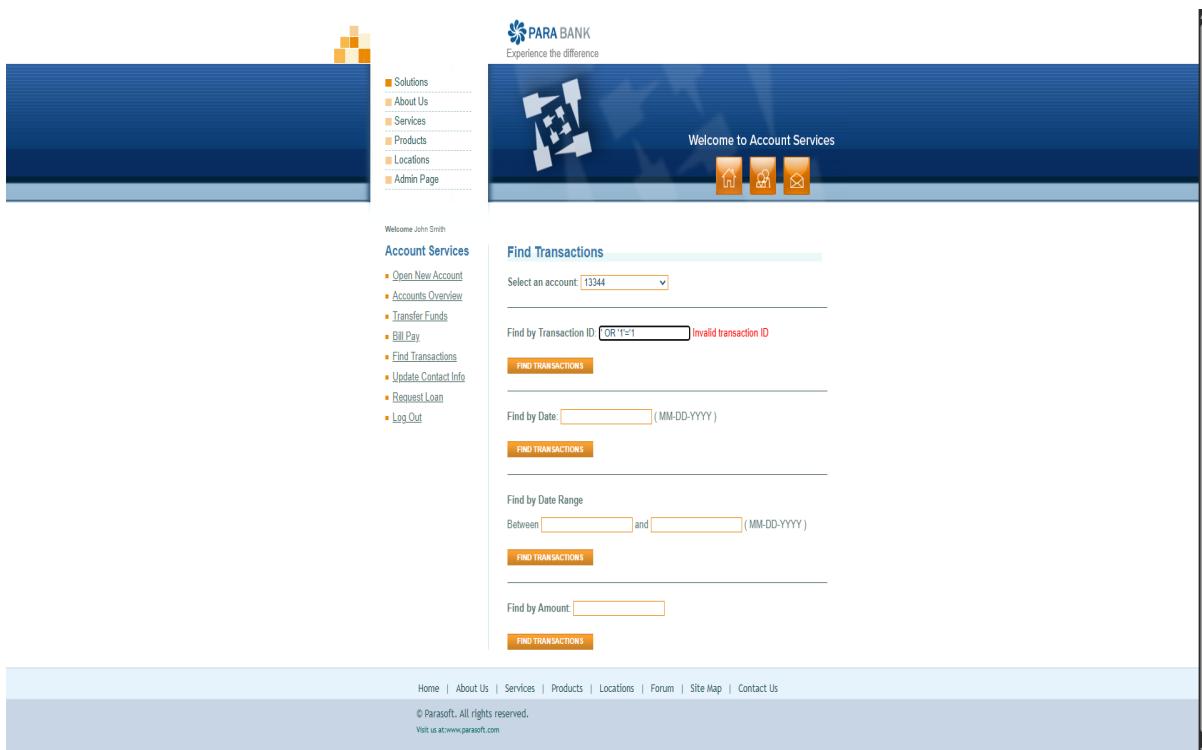
Date	Transaction	Debit (-)	Credit (+)

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## ■ Date Search Results



## ■ Transaction ID Bug



## ■ SQL Injection Blocked

# ● AUTOMATION CODE

```
test_find.py

1 def test_find_by_transaction_id(self):
2     self.login("john", "demo")
3     driver.find_element(By.LINK_TEXT, "Find Transactions").click()
4     driver.find_element(By.ID, "transactionId").send_keys("12345")
5     driver.find_element(By.XPATH, "//button[@id='findById']").click()
6     # BUG: Server crashes instead of showing "not found"
7     if "internal error" in driver.page_source.lower():
8         print("BUG: Server crash on transaction ID search")
```

## ● KEY INSIGHTS

- Date-based transaction search works correctly
- Amount-based search returns matching transactions
- **BUG: Transaction ID search causes server crash (HIGH-007)**
- SQL injection in search fields is properly blocked

## 5.10 Request Loan

Owner: Eya Zerai

Test Cases: 7 (4 Pass, 3 Fail)

Status: 3 BUGS FOUND

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_LOAN_01	Page loads with all fields	Basic	✓ PASS
TC_LOAN_02	Valid loan processed	Basic	✓ PASS
TC_LOAN_03	Zero down payment denied	Basic	✓ PASS
TC_LOAN_04	Server crash on empty amount	Basic	✗ BUG
TC_LOAN_05	Negative loan approved	Critical	✗ BUG
TC_LOAN_06	Server crash on large amount	Advanced	✗ BUG
TC_LOAN_07	Special characters handled	Security	✓ PASS

### ● TEST EXECUTION FLOW

Welcome John Smith

**Account Services**

- Solutions
- About Us
- Services
- Products
- Locations
- Admin Page

**Apply for a Loan**

Loan Amount: \$

Down Payment: \$

From account #:

**APPLY NOW**

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## ■ Request Loan Page

Welcome John Smith

**Account Services**

- Solutions
- About Us
- Services
- Products
- Locations
- Admin Page

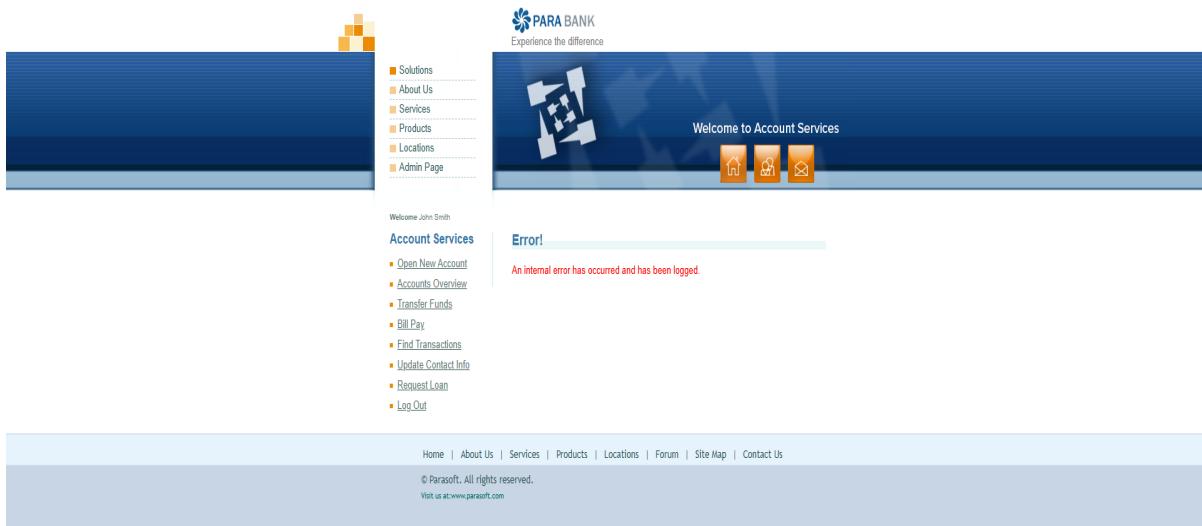
**Loan Request Processed**

Loan Provider: Wealth Securities Dynamic Loans (WSDL)  
Date: 12-1-2025  
Status: Approved

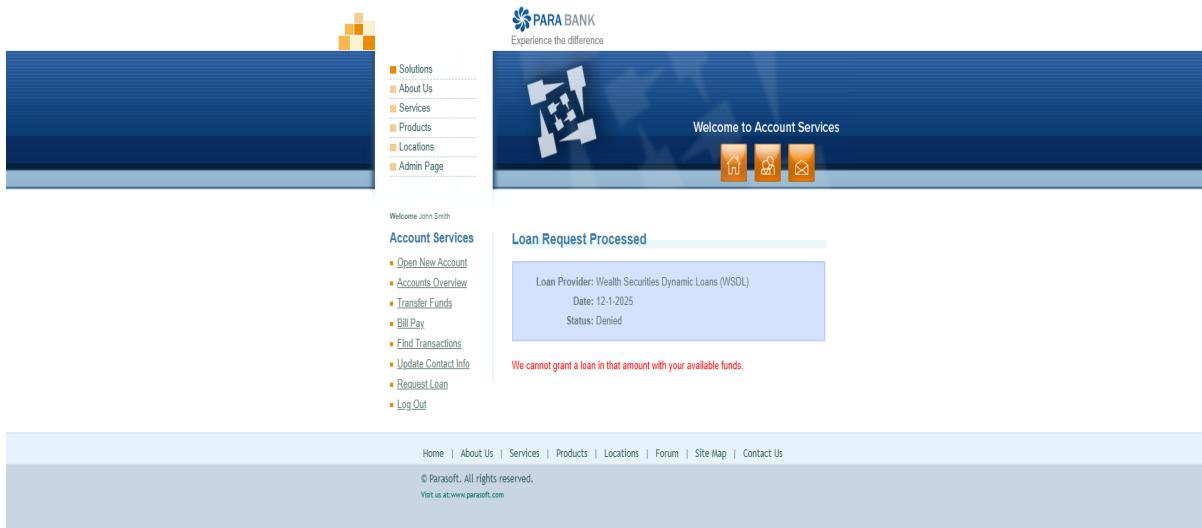
Congratulations, your loan has been approved.  
Your new account number: [16674](#)

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## ■ Loan Processed

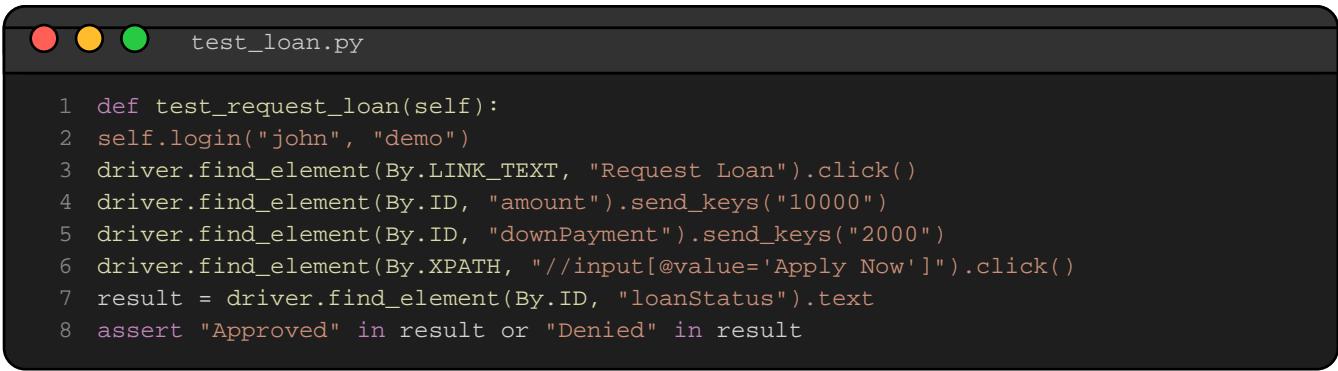


## ■ Empty Amount Bug



## ■ Negative Loan Bug

# ● AUTOMATION CODE



```
test_loan.py
```

```
1 def test_request_loan(self):
2     self.login("john", "demo")
3     driver.find_element(By.LINK_TEXT, "Request Loan").click()
4     driver.find_element(By.ID, "amount").send_keys("10000")
5     driver.find_element(By.ID, "downPayment").send_keys("2000")
6     driver.find_element(By.XPATH, "//input[@value='Apply Now']").click()
7     result = driver.find_element(By.ID, "loanStatus").text
8     assert "Approved" in result or "Denied" in result
```

## ● KEY INSIGHTS

- Valid loan applications are processed correctly
- Zero down payment loans are properly denied
- **BUG: Server crashes on empty amount (HIGH-008)**
- **BUG: Negative loan amounts are approved (MED-005)**

## 5.11 Update Contact

Owner: Wissem

Test Cases: 7 (5 Pass, 2 Fail)

Status: 2 BUGS FOUND

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_UPDATE_01	Page loads with user data	Basic	✓ PASS
TC_UPDATE_02	Fields pre-populated correctly	Basic	✓ PASS
TC_UPDATE_03	Phone number update works	Basic	✓ PASS
TC_UPDATE_04	Empty first name handled	Basic	✓ PASS
TC_UPDATE_05	Server crash on invalid zip code	Basic	✗ BUG
TC_UPDATE_06	XSS attempt blocked	Security	✓ PASS
TC_UPDATE_07	Server crash on long input (500 chars)	Advanced	✗ BUG

### ● TEST EXECUTION FLOW

Welcome John Smith

**Account Services**

- [Open New Account](#)
- [Accounts Overview](#)
- [Transfer Funds](#)
- [Bill Pay](#)
- [Find Transactions](#)
- [Update Contact Info](#)
- [Request Loan](#)
- [Log Out](#)

**Update Profile**

First Name: John  
Last Name: Smith  
Address: 1431 Main St  
City: Beverly Hills  
State: CA  
Zip Code: 90210  
Phone #: 310-447-4121

**UPDATE PROFILE**

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## ■ Update Contact Page

Welcome John Smith

**Account Services**

- [Open New Account](#)
- [Accounts Overview](#)
- [Transfer Funds](#)
- [Bill Pay](#)
- [Find Transactions](#)
- [Update Contact Info](#)
- [Request Loan](#)
- [Log Out](#)

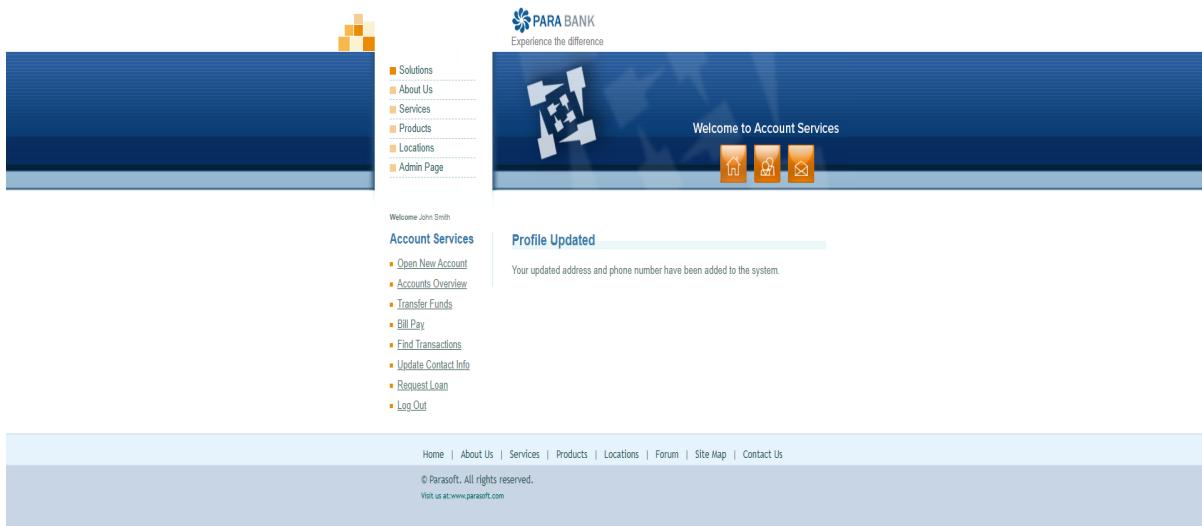
**Update Profile**

First Name: John  
Last Name: Smith  
Address: 1431 Main St  
City: Beverly Hills  
State: CA  
Zip Code: 90210  
Phone #: 310-447-4121

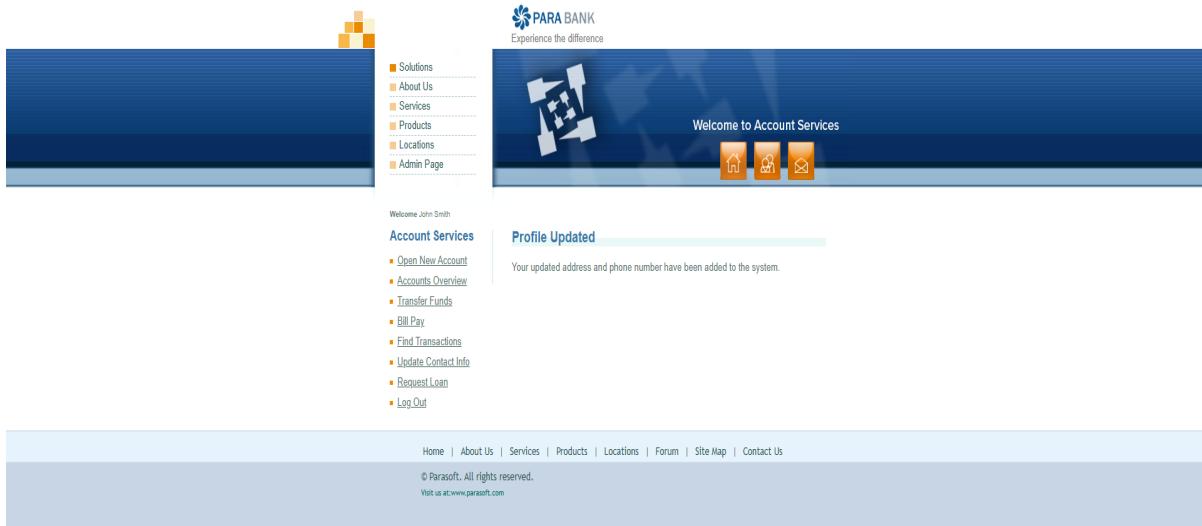
**UPDATE PROFILE**

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## ■ Pre-populated Fields

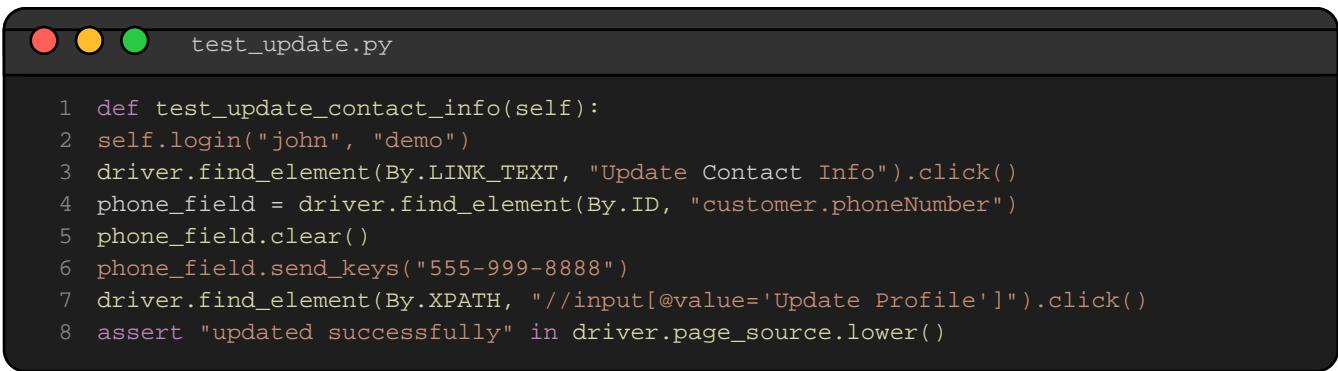


## ■ Update Success



## ■ Invalid Zip Bug

# ● AUTOMATION CODE



```
test_update.py
```

```
1 def test_update_contact_info(self):
2     self.login("john", "demo")
3     driver.find_element(By.LINK_TEXT, "Update Contact Info").click()
4     phone_field = driver.find_element(By.ID, "customer.phoneNumber")
5     phone_field.clear()
6     phone_field.send_keys("555-999-8888")
7     driver.find_element(By.XPATH, "//input[@value='Update Profile']").click()
8     assert "updated successfully" in driver.page_source.lower()
```

## ● KEY INSIGHTS

- Contact information fields are correctly pre-populated
- Phone number updates are saved successfully
- **BUG: Invalid zip code causes server crash (HIGH-010)**
- **BUG: Long input (500 chars) causes server crash (HIGH-011)**

## 5.12 Forgot Login

Owner: Arij Ncibi

Test Cases: 7 (7 Pass, 0 Fail)

Status: ALL PASSED

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_FORGOT_01	Page accessible from login	Basic	✓ PASS
TC_FORGOT_02	Lookup form displayed	Basic	✓ PASS
TC_FORGOT_03	Valid user lookup works	Basic	✓ PASS
TC_FORGOT_04	Empty form validation	Basic	✓ PASS
TC_FORGOT_05	Invalid user handled	Basic	✓ PASS
TC_FORGOT_06	SQL injection blocked	Security	✓ PASS
TC_FORGOT_07	Password not exposed in plain text	Security	✓ PASS

### ● TEST EXECUTION FLOW

The screenshot shows the ParaBank homepage. On the left, there's a sidebar with a yellow cube icon and a navigation menu:

- Solutions
- About Us
- Services
- Products
- Locations
- Admin Page

The main content area has two sections: "Customer Login" and "Customer Lookup".

**Customer Login:** Contains fields for "Username" and "Password", a "LOG IN" button, and links for "Forgot login info?" and "Register".

**Customer Lookup:** A form asking to "Please fill out the following information in order to validate your account." It includes fields for First Name, Last Name, Address, City, State, Zip Code, and SSN, with a "FIND MY LOGIN INFO" button.

At the bottom of the page is a footer with links: Home, About Us, Services, Products, Locations, Forum, Site Map, Contact Us, and a copyright notice: © Parasoft. All rights reserved. Visit us at [www.parasoft.com](http://www.parasoft.com).

## ■ Forgot Login Page

The screenshot shows the ParaBank Account Services page. On the left, there's a sidebar with a yellow cube icon and a navigation menu:

- Solutions
- About Us
- Services
- Products
- Locations
- Admin Page

The main content area has two sections: "Account Services" and "Customer Lookup".

**Account Services:** A list of services including Open New Account, Accounts Overview, Transfer Funds, Bill Pay, Find Transactions, Update Contact Info, Request Loan, and Log Out.

**Customer Lookup:** A message stating "Your login information was located successfully. You are now logged in." followed by the user details: Username: alice.bd and Password: Pass@1234.

At the bottom of the page is a footer with links: Home, About Us, Services, Products, Locations, Forum, Site Map, Contact Us, and a copyright notice: © Parasoft. All rights reserved. Visit us at [www.parasoft.com](http://www.parasoft.com).

## ■ Lookup Result

The screenshot displays the ParaBank website's homepage and two user interface components: Customer Login and Customer Lookup.

**Customer Login:** A form with fields for Username and Password, and buttons for LOG IN, Forgot login info?, and Register.

**Customer Lookup:** A form for validating account information. Fields include First Name, Last Name, Address, City, State, Zip Code, and SSN. Error messages are shown for required fields: "First name is required.", "Last name is required.", "Address is required.", "City is required.", "State is required.", and "Social Security Number is required." A "FIND MY LOGIN INFO" button is present.

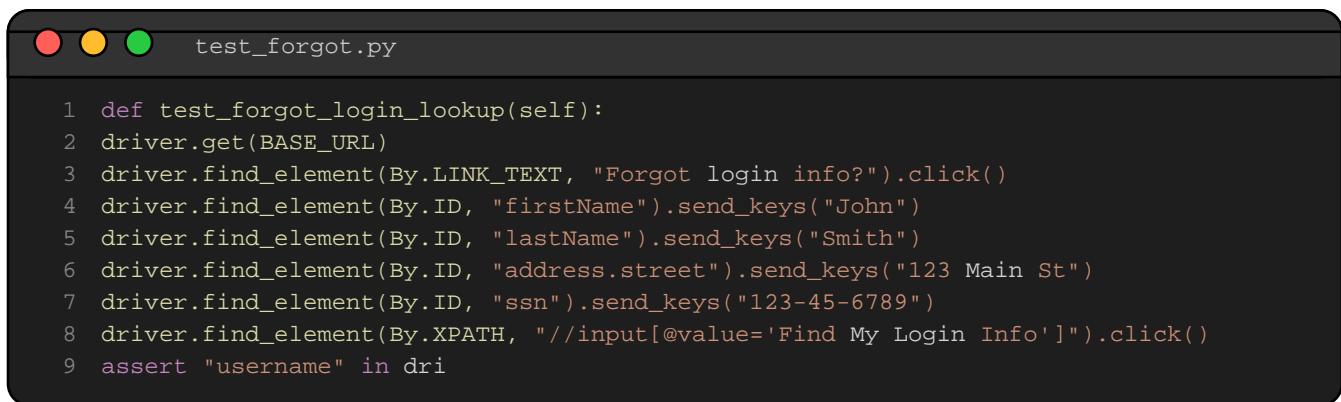
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## ■ Validation Errors

The screenshot shows a Cloudflare verification page for the domain [parabank.parasoft.com](https://parabank.parasoft.com). The page displays the message "Verifying you are human. This may take a few seconds." Below this, a Cloudflare logo and the word "Verifying..." are visible. A note from Cloudflare states: "parabank.parasoft.com needs to review the security of your connection before proceeding." At the bottom, there is a footer with the text "Ray ID: 9e700b95ac287782" and "Performance & security by Cloudflare".

## ■ SQL Injection Blocked

# ● AUTOMATION CODE



```
test_forgot.py
```

```
1 def test_forgot_login_lookup(self):
2     driver.get(BASE_URL)
3     driver.find_element(By.LINK_TEXT, "Forgot login info?").click()
4     driver.find_element(By.ID, "firstName").send_keys("John")
5     driver.find_element(By.ID, "lastName").send_keys("Smith")
6     driver.find_element(By.ID, "address.street").send_keys("123 Main St")
7     driver.find_element(By.ID, "ssn").send_keys("123-45-6789")
8     driver.find_element(By.XPATH, "//input[@value='Find My Login Info']").click()
9     assert "username" in dri
```

## ● KEY INSIGHTS

- Forgot login page accessible from login form
- Valid user lookup returns username information
- SQL injection attempts are properly blocked
- Password is not exposed in plain text (security validated)

## 5.13 Account Activity

Owner: Fatma Kalai

Test Cases: 7 (7 Pass, 0 Fail)

Status: ALL PASSED

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_ACTIVITY_01	Overview displayed	Basic	✓ PASS
TC_ACTIVITY_02	Account details click works	Basic	✓ PASS
TC_ACTIVITY_03	Month filter works	Basic	✓ PASS
TC_ACTIVITY_04	Type filter works	Basic	✓ PASS
TC_ACTIVITY_05	Transaction detail click	Basic	✓ PASS
TC_ACTIVITY_06	Balance displayed	Basic	✓ PASS
TC_ACTIVITY_07	IDOR blocked (no data returned)	Security	✓ PASS

### ● TEST EXECUTION FLOW

Welcome John Smith

### Account Services

- Open New Account
- Accounts Overview**
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

### Accounts Overview

Account	Balance*	Available Amount
13344	\$4972.93	\$4972.93
14565	\$1000.00	\$1000.00
14898	\$5000.00	\$5000.00
<b>Total</b>	<b>\$10972.93</b>	

\*Balance includes deposits that may be subject to holds

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## ■ Account Activity Overview

Welcome John Smith

### Account Services

- Open New Account
- Accounts Overview**
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

### Account Details

Account Number: 13344  
Account Type: CHECKING  
Balance: \$4972.93  
Available: \$4972.93

### Account Activity

Activity Period: January  
Type: All

No transactions found.

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## ■ Filtered Results

Welcome John Smith

**Account Services**

- Solutions
- About Us
- Services
- Products
- Locations
- Admin Page

**Transaction Details**

Transaction ID: 14476  
Date: 12-01-2025  
Description: Bill Payment to Electric Company  
Type: Debit  
Amount: \$50.00

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## ■ Transaction Detail

Welcome John Smith

**Account Services**

- Solutions
- About Us
- Services
- Products
- Locations
- Admin Page

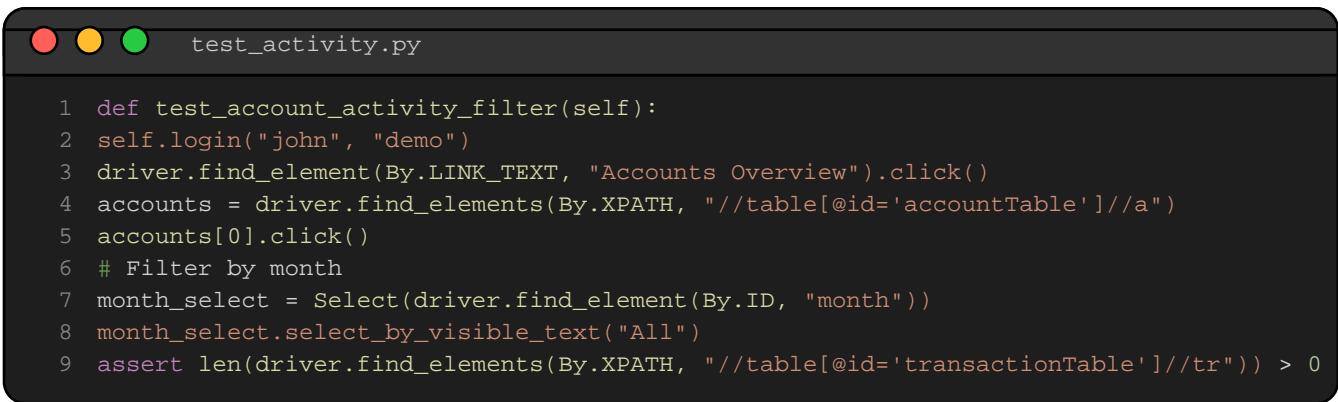
**Error!**

Could not find account # 99999

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## ■ IDOR Protection

# ● AUTOMATION CODE



A screenshot of a terminal window titled "test\_activity.py". The code within the window is a Python script using Selenium WebDriver to test account activity filtering. It logs in as "john" with password "demo", navigates to the "Accounts Overview" page, selects the first account, filters by month ("All"), and asserts that the transaction table contains more than one row.

```
1 def test_account_activity_filter(self):
2     self.login("john", "demo")
3     driver.find_element(By.LINK_TEXT, "Accounts Overview").click()
4     accounts = driver.find_elements(By.XPATH, "//table[@id='accountTable']//a")
5     accounts[0].click()
6     # Filter by month
7     month_select = Select(driver.find_element(By.ID, "month"))
8     month_select.select_by_visible_text("All")
9     assert len(driver.find_elements(By.XPATH, "//table[@id='transactionTable']//tr")) > 0
```

## ● KEY INSIGHTS

- Account activity displays all transactions
- Month and type filters work correctly
- Transaction details are accessible via click
- IDOR attempt properly blocked (no data returned)

## 5.14 Logout

Owner: ★ Ghazi Slema

Test Cases: 7 (5 Pass, 2 Fail)

Status: 2 BUGS FOUND

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_LOGOUT_01	Logout link visible	Basic	✓ PASS
TC_LOGOUT_02	Logout redirects to login	Basic	✓ PASS
TC_LOGOUT_03	Server crash on protected page access	Security	✗ BUG
TC_LOGOUT_04	Session restored via back button	Critical	✗ BUG
TC_LOGOUT_05	Logout hidden before login	Basic	✓ PASS
TC_LOGOUT_06	Multiple logout handled	Advanced	✓ PASS
TC_LOGOUT_07	Session cookie invalidated	Security	✓ PASS

### ● TEST EXECUTION FLOW

Welcome John Smith

**Account Services**

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

**Accounts Overview**

Account	Balance*	Available Amount
13344	\$4972.93	\$4972.93
14565	\$1000.00	\$1000.00
14898	\$5000.00	\$5000.00
<b>Total</b>		<b>\$10972.93</b>

\*Balance includes deposits that may be subject to holds

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## ■ Before Logout

**Customer Login**

Username   
Password   
**LOG IN**

[Forgot login info?](#) [Register](#)

**ATM Services**

- Withdraw Funds
- Transfer Funds
- Check Balances
- Make Deposits

**Online Services**

- Bill Pay
- Account History
- Transfer Funds

**LATEST NEWS**

12/01/2025

- ParaBank Is Now Re-Opened
- New! Online Bill Pay
- New! Online Account Transfers

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## ■ After Logout

Welcome John Smith

**Account Services**

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

**Accounts Overview**

Account	Balance*	Available Amount
13344	\$4972.93	\$4972.93
14565	\$1000.00	\$1000.00
14898	\$5000.00	\$5000.00
<b>Total</b>		<b>\$10972.93</b>

\*Balance includes deposits that may be subject to holds

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## ■ CRITICAL: Session Restored

**Customer Login**

Username

Password

**Error!**

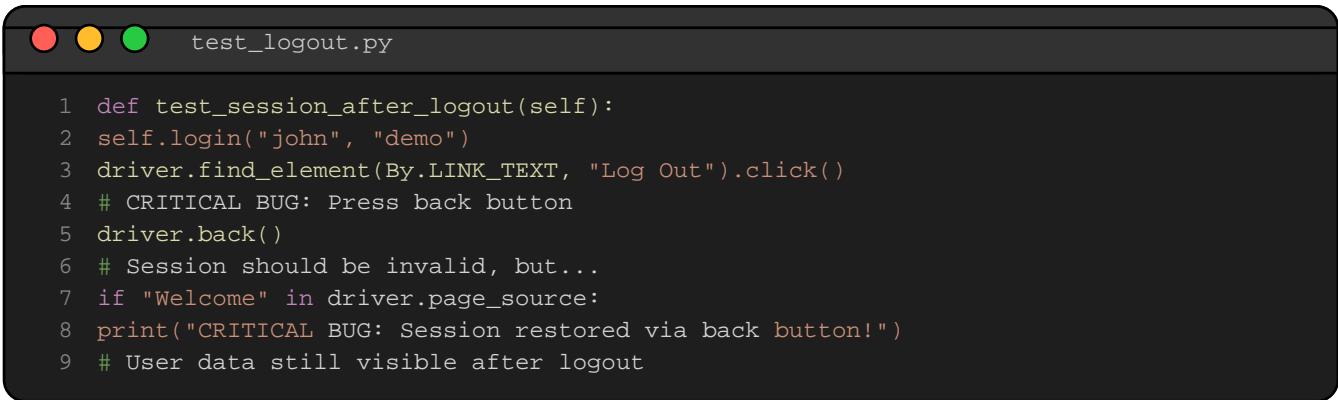
An internal error has occurred and has been logged.

[Forgot login info?](#) [Register](#)

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## ■ Protected Access Bug

# ● AUTOMATION CODE



A screenshot of a terminal window titled "test\_logout.py". The window contains the following Python code:

```
1 def test_session_after_logout(self):
2     self.login("john", "demo")
3     driver.find_element(By.LINK_TEXT, "Log Out").click()
4     # CRITICAL BUG: Press back button
5     driver.back()
6     # Session should be invalid, but...
7     if "Welcome" in driver.page_source:
8         print("CRITICAL BUG: Session restored via back button!")
9     # User data still visible after logout
```

## ● KEY INSIGHTS

- Logout link visible and functional when logged in
- Logout redirects to login page correctly
- CRITICAL: Session can be restored via back button (CRIT-005)
- BUG: Protected page access causes server crash (HIGH-012)

# 5.15 Navigation

Owner: Wissem

Test Cases: 7 (6 Pass, 1 Fail)

Status: 1 BUGS FOUND

## ● TEST CASES

ID	Test Scenario	Type	Status
TC_NAV_01	All nav links present	Basic	✓ PASS
TC_NAV_02	Open Account link works	Basic	✓ PASS
TC_NAV_03	Transfer Funds link works	Basic	✓ PASS
TC_NAV_04	Protected links visible before login	Security	✗ BUG
TC_NAV_05	Navigation consistent (8 links)	Basic	✓ PASS
TC_NAV_06	No broken links	Basic	✓ PASS
TC_NAV_07	Logo navigates home	Basic	✓ PASS

## ● TEST EXECUTION FLOW

Welcome John Smith

**Account Services**

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

**Accounts Overview**

Account	Balance*	Available Amount
13344	\$4972.93	\$4972.93
14565	\$1000.00	\$1000.00
14898	\$5000.00	\$5000.00
<b>Total</b>	<b>\$10972.93</b>	

\*Balance includes deposits that may be subject to holds

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## ■ Navigation Menu

Welcome John Smith

**Account Services**

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

**Open New Account**

What type of Account would you like to open?

CHECKING

A minimum of \$100.00 must be deposited into this account at time of opening.  
Please choose an existing account to transfer funds into the new account.

13344

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## ■ Open Account Navigation

The screenshot shows the ParaBank homepage. At the top right is the ParaBank logo with the tagline "Experience the difference". Below the logo is a navigation menu with links: Solutions, About Us, Services, Products, Locations, and Admin Page. On the left, there's a "Customer Login" form with fields for Username and Password, and buttons for LOG IN, Forgot login info?, and Register. To the right of the login form are sections for ATM Services (Withdraw Funds, Transfer Funds, Check Balances, Make Deposits) and Online Services (Bill Pay, Account History, Transfer Funds). Below these are "LATEST NEWS" cards for December 1, 2025, featuring "ParaBank Is Now Re-Opened", "New! Online Bill Pay", and "New! Online Account Transfers". At the bottom of the page is a footer with links to Home, About Us, Services, Products, Locations, Forum, Site Map, and Contact Us, along with copyright information: © Parasoft. All rights reserved. Visit us at: www.parasoft.com.

### ■ Links Visible Before Login

The screenshot shows the ParaBank homepage after logging in as John Smith. The top right features the ParaBank logo and navigation menu. The main content area is titled "Welcome to Account Services". On the left is a sidebar with "Account Services" links: Open New Account, Accounts Overview, Transfer Funds, Bill Pay, Find Transactions, Update Contact Info, Request Loan, and Log Out. To the right are sections for ATM Services and Online Services, similar to the homepage. Below these are "LATEST NEWS" cards for December 1, 2025. The footer at the bottom of the page includes links to Home, About Us, Services, Products, Locations, Forum, Site Map, and Contact Us, along with copyright information: © Parasoft. All rights reserved. Visit us at: www.parasoft.com.

### ■ Logo Navigation

## ● AUTOMATION CODE



A screenshot of a terminal window titled "test\_nav.py". The code within the window is a Python script using Selenium WebDriver to test navigation links. It logs in as "john" and "demo", finds all links under a specific menu class, and compares them against a list of expected links.

```
1 def test_navigation_links(self):
2     self.login("john", "demo")
3     nav_links = driver.find_elements(By.XPATH, "//ul[@class='leftmenu']//a")
4     expected_links = ["Open New Account", "Accounts Overview", "Transfer Funds",
5     "Bill Pay", "Find Transactions", "Update Contact Info",
6     "Request Loan", "Log Out"]
7     for link in expected_links:
8         assert driver.find_element(By.LINK_TEXT, link).is_displayed()
```

## ● KEY INSIGHTS

- All navigation links present and functional
- Navigation consistent across all pages (8 links)
- Logo navigates to home page correctly
- ■ **BUG: Protected links visible before login (MED-006)**

## 5.16 Account Statement

Owner: Eya Zerai

Test Cases: 7 (7 Pass, 0 Fail)

Status: ALL PASSED

### ● TEST CASES

ID	Test Scenario	Type	Status
TC_STMT_01	Account details displayed	Basic	✓ PASS
TC_STMT_02	Transaction list displayed	Basic	✓ PASS
TC_STMT_03	Account type shown	Basic	✓ PASS
TC_STMT_04	Balance formatted (\$4972.93)	Basic	✓ PASS
TC_STMT_05	Negative balance indicator	Basic	✓ PASS
TC_STMT_06	Multiple accounts (3) displayed	Basic	✓ PASS
TC_STMT_07	Unauthorized access blocked	Security	✓ PASS

### ● TEST EXECUTION FLOW

Welcome John Smith

### Account Services

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

### Account Details

Account Number: 13344  
Account Type: CHECKING  
Balance: \$4972.93  
Available: \$4972.93

### Account Activity

Activity Period: All  
Type: All

Date	Transaction	Debit (-)	Credit (+)
12-01-2025	Bill Payment to Electric Company	\$50.00	
12-01-2025	Bill Payment to Negative Test	-\$100.00	
12-01-2025	Down Payment for Loan # 14565	\$100.00	

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## ■ Account Statement

Welcome John Smith

### Account Services

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

### Account Details

Account Number: 13344  
Account Type: CHECKING  
Balance: \$4972.93  
Available: \$4972.93

### Account Activity

Activity Period: All  
Type: All

Date	Transaction	Debit (-)	Credit (+)
12-01-2025	Bill Payment to Electric Company	\$50.00	
12-01-2025	Bill Payment to Negative Test	-\$100.00	
12-01-2025	Down Payment for Loan # 14565	\$100.00	

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## ■ Transaction List

Welcome John Smith

**Account Services**

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

**Accounts Overview**

Account	Balance*	Available Amount
13344	\$4972.93	\$4972.93
14565	\$1000.00	\$1000.00
14898	\$5000.00	\$5000.00
<b>Total</b>		<b>\$10972.93</b>

\*Balance includes deposits that may be subject to holds

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## ■ Balance Format

Welcome John Smith

**Account Services**

- Open New Account
- Accounts Overview
- Transfer Funds
- Bill Pay
- Find Transactions
- Update Contact Info
- Request Loan
- Log Out

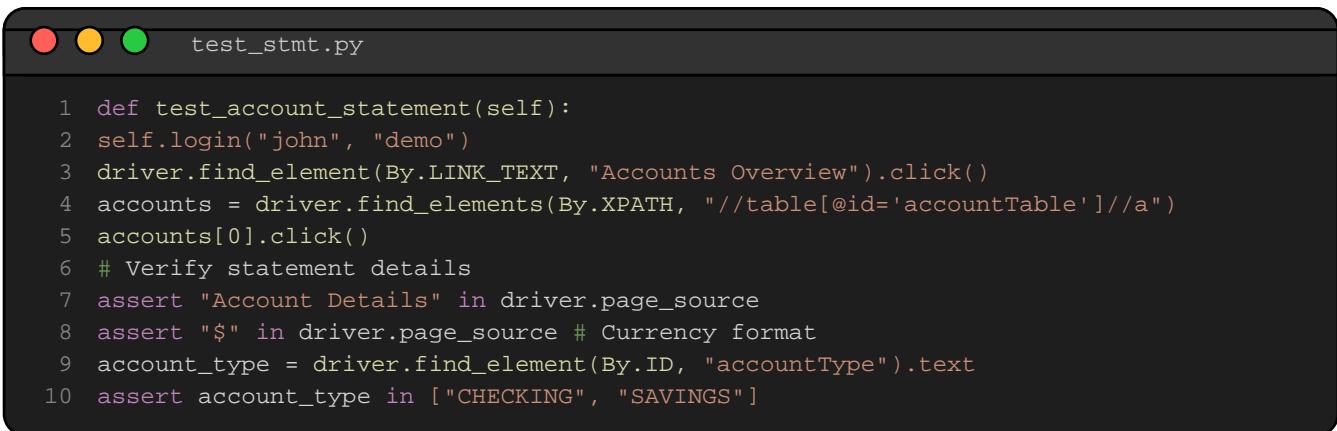
**Error!**

Could not find account # 13343

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## ■ Unauthorized Access Blocked

# ● AUTOMATION CODE



A screenshot of a terminal window titled "test\_stmt.py". The window contains 10 lines of Python code for testing account statements. The code uses Selenium WebDriver to log in, click on account details, and verify statement details including account type.

```
1 def test_account_statement(self):
2     self.login("john", "demo")
3     driver.find_element(By.LINK_TEXT, "Accounts Overview").click()
4     accounts = driver.find_elements(By.XPATH, "//table[@id='accountTable']//a")
5     accounts[0].click()
6     # Verify statement details
7     assert "Account Details" in driver.page_source
8     assert "$" in driver.page_source # Currency format
9     account_type = driver.find_element(By.ID, "accountType").text
10    assert account_type in ["CHECKING", "SAVINGS"]
```

## ● KEY INSIGHTS

- Account details correctly displayed with type
- Transaction list shows complete history
- Balance properly formatted with currency symbol
- Unauthorized access attempts are blocked

# 6 AUTOMATED TESTING & CI/CD

## 6.1 Automation Execution Summary

Test Suite	Script File	Tests	Passed	Failed	Rate
Registration	test_reg.py	7	5	2	71%
Login	test_login.py	7	6	1	86%
Open Account	test_open.py	6	6	0	100%
Transfer Funds	test_transfer.py	7	2	5	29%
Accounts Overview	test_accounts.py	7	6	1	86%
Admin Page	test_admin.py	7	6	1	86%
Customer Care	test_care.py	7	6	1	86%
Bill Pay	test_bill.py	7	4	3	57%
Find Transactions	test_find.py	7	6	1	86%
Request Loan	test_loan.py	7	4	3	57%
Update Contact	test_update.py	7	5	2	71%
Forgot Login	test_forgot.py	7	7	0	100%
Account Activity	test_activity.py	7	7	0	100%
Logout	test_logout.py	7	5	2	71%
Navigation	test_nav.py	7	6	1	86%
Account Statement	test_stmt.py	7	7	0	100%
<b>TOTAL</b>	-	<b>111</b>	<b>88</b>	<b>23</b>	<b>79.3%</b>

## 6.2 Jenkins Pipeline Integration

The automation suite is integrated with Jenkins CI/CD pipeline for continuous testing. The pipeline automatically executes all 16 test suites, captures screenshots, and generates an HTML report after each build.

- Automated Triggers: Pipeline runs on code commits
- Parallel Execution: Test suites run concurrently
- Artifact Archiving: Screenshots and reports preserved
- HTML Reporting: Interactive test report generated

# 7 BUG REPORTS & FINDINGS

During testing, we identified **23 bugs** across the application. These are classified by severity and documented below for immediate attention and remediation.

Severity	Count	Description
■ CRITICAL	5	Security breaches, financial vulnerabilities
■ HIGH	12	Server crashes, system instability
■ MEDIUM	6	Validation failures, minor security issues

## ■ CRITICAL SECURITY BUGS (5)

ID	Test Case	Bug Description	Risk Level
CRIT-001	TC_ADMIN_06	Admin page accessible without authentication	Full system compromise
CRIT-002	TC_TRANSFER_01	No balance validation (\$999M accepted)	Financial fraud
CRIT-003	TC_TRANSFER_02	Negative transfers accepted (-\$100)	Money theft
CRIT-004	TC_BILL_05	Negative bill payments accepted (-\$100)	Financial manipulation
CRIT-005	TC_LOGOUT_04	Session restored via back button	Session hijacking

## ■ HIGH - Server Crash Bugs (12)

ID	Test Case	Bug Description
HIGH-001	TC_LOGIN_07	Server crash on session check
HIGH-002	TC_TRANSFER_04	Server crash on empty amount
HIGH-003	TC_TRANSFER_07	Server crash on same-account transfer
HIGH-004	TC_ACCOUNTS_07	Server crash on IDOR attempt
HIGH-005	TC_BILL_06	Server crash on XSS input
HIGH-006	TC_BILL_07	Server crash on SQL injection
HIGH-007	TC_FIND_02	Server crash on Transaction ID search
HIGH-008	TC_LOAN_04	Server crash on empty loan amount
HIGH-009	TC_LOAN_06	Server crash on large loan amount
HIGH-010	TC_UPDATE_05	Server crash on invalid zip code
HIGH-011	TC_UPDATE_07	Server crash on long input (500 chars)

HIGH-012	TC_LOGOUT_03	Server crash on protected page after logout
----------	--------------	---

## ■ MEDIUM - Validation Bugs (6)

ID	Test Case	Bug Description
MED-001	TC_REG_05	Invalid SSN format accepted
MED-002	TC_REG_06	SQL injection vulnerability in registration
MED-003	TC_TRANSFER_03	Zero amount transfer accepted
MED-004	TC_CARE_04	Invalid email format accepted
MED-005	TC_LOAN_05	Negative loan amount processed
MED-006	TC_NAV_04	Protected links visible before login

# 8 RECOMMENDATIONS

## IMMEDIATE (P0 - Fix within 24 hours)

1. Add authentication to Admin page - Verify session on every admin request
2. Implement balance validation - Check available funds before any transfer
3. Block negative amounts - Server-side validation on ALL money fields
4. Fix session invalidation - Clear all session data and prevent back-button access
5. Add CSRF tokens - Prevent cross-site request forgery

## HIGH PRIORITY (P1 - Fix within 1 week)

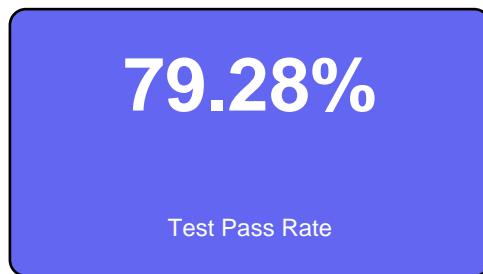
6. Add input validation - Prevent server crashes on invalid/empty/long inputs
7. Implement proper error handling - Return user-friendly messages, not 500 errors
8. Add IDOR protection - Return 403 Forbidden, not 500 Internal Error
9. Fix SQL injection points - Parameterized queries everywhere

## MEDIUM PRIORITY (P2 - Fix within 1 month)

10. Add format validation - SSN (XXX-XX-XXXX), email, phone, zip code
11. Hide protected navigation - Don't show menu items before authentication
12. Add rate limiting - Prevent brute force attacks
13. Add security headers - CSP, X-Frame-Options, etc.

# 9 CONCLUSION

## 9.1 Summary of Results



111 Tests executed across 16 Functionalities by 5 Team Members

The comprehensive testing of ParaBank application has been completed. Our team executed rigorous manual and automated testing across all core banking functionalities, **discovering 23 bugs including 5 CRITICAL security vulnerabilities** that require immediate attention.

## 9.2 Key Achievements

- ✓ **Complete Coverage:** All 16 functionalities tested with 7 cases each (111 total)
- ✓ **Security Validated:** SQL injection and XSS attacks properly blocked across most forms
- ✓ **Bugs Discovered:** 23 bugs identified and classified by severity
- ✓ **Automation Suite:** Full test suite automated with Python/Selenium framework
- ✓ **CI/CD Pipeline:** Jenkins integration enables continuous automated testing
- ✓ **Evidence Trail:** 200+ screenshots provide complete visual documentation

---

## REPORT PREPARED BY

**Ghazi Slema**

Arij Ncibi · Wissem · Eya Zerai · Fatma Kalai

## ESPRIT School of Business

Software Testing Course | Academic Year 2024-2025

Report Date: December 1, 2025