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# **CASE STUDY ON**

## **Insurance Claim And**

## **Management System**

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# INTRODUCTION

- **The Insurance Management System** is a web-based application designed to digitally manage insurance operations, including policy administration, claim processing, and system oversight through dedicated portals.
- **The system is structured into three modules** - Admin, Policy, and Claim portals - ensuring clear role separation, secure access, and efficient workflow management.
- **Built using modern web and backend technologies**, the project emphasizes scalability, responsiveness, and maintainability, making it suitable for real-world insurance management scenarios.

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# ABSTRACT

- The project focuses on **centralized data management**, allowing insurance records to be stored, retrieved, and updated efficiently within a single integrated system.
- It enhances **operational transparency** by enabling systematic tracking of policies and claims throughout their lifecycle.
- The application supports informed **decision-making** by providing structured data flow and consistent record maintenance for insurance operations.

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## WHAT WE ARE GOING TO BUILD: CLIENT REQUIREMENT?

**Client wants an Insurance Management System** to manage insurance policies, claims, and administrative records efficiently.

### **System Requirements:**

- Admin manages policy and claim records (create, update, delete, view).
  - Policy module handles policy details and premium information.
  - Claim module manages claim requests and claim status tracking.
  - Policies and claims are categorized for organized and efficient processing.
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## WHAT WE ARE GOING TO BUILD: SOME TECHNICAL TERMS

- Develop REST APIs using Spring Boot with proper Login and Registration modules.
- Implement JWT-based authentication and role-based authorization using Spring Security.
- Apply input validation using Hibernate Validator and handle errors with global exception handling.
- Enable pagination and sorting for APIs using Spring Data JPA.
- Document APIs using OpenAPI for easy consumer understanding.
- Deploy the Spring Boot backend on a cloud platform for scalable access.

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# WHAT ARE THE TECHNOLOGIES AND TOOLS WE USE ?

- ☐ **Framework:** Spring Boot Java Framework
- ☐ **Programming Language:** Java 8+
- ☐ **Build Tool:** Maven
- ☐ **IDE:** Spring Tool Suite (STS)
- ☐ **Server:** Apache Tomcat
- ☐ **Spring Modules:** Spring Core, Spring Security (JWT), Spring Data JPA (Hibernate), etc.
- ☐ **Database:** MySQL
- ☐ **API Testing:** Postman REST Client
- ☐ **API Documentation:** Swagger

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## SYSTEM REQUIREMENTS

- ☐ **Back End:** Spring Boot, JPA Hibernate, and Postman Tool
- ☐ **DB Server:** MySQL Server 8.0 CE
- ☐ **Web Server:** Apache Tomcat
- ☐ **IDE:** Spring Tool Suite (STS)
- ☐ **Browser:** Google Chrome
- ☐ **Test:** JUnit

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## PROJECT MODULES

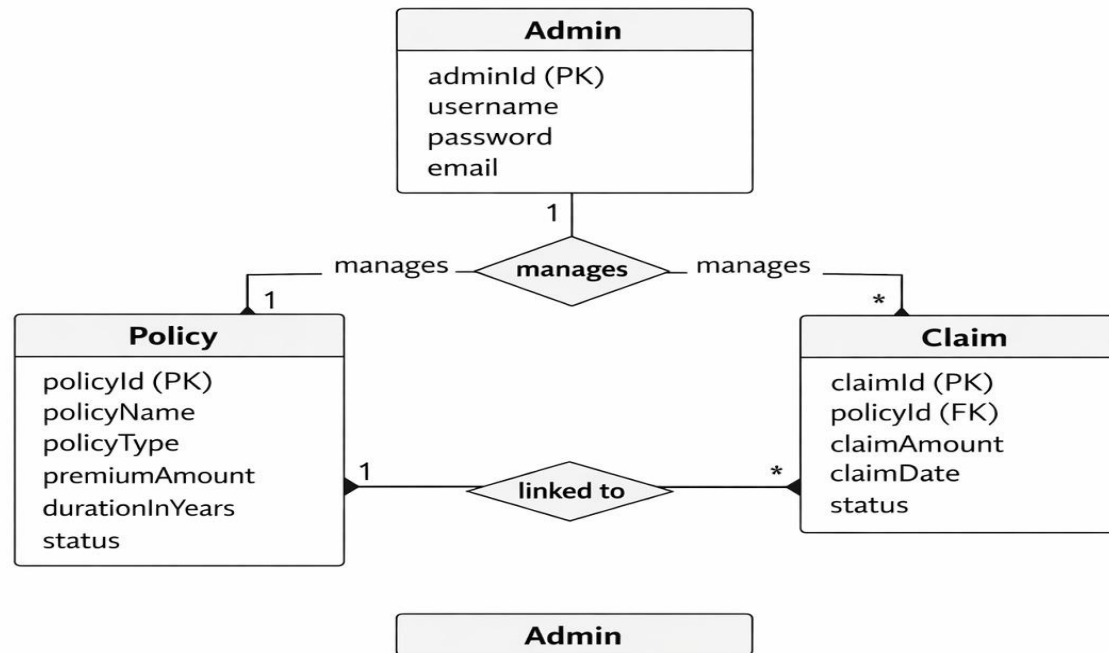
☐ Admin Module

☐ Policy Module

☐ Claim Module



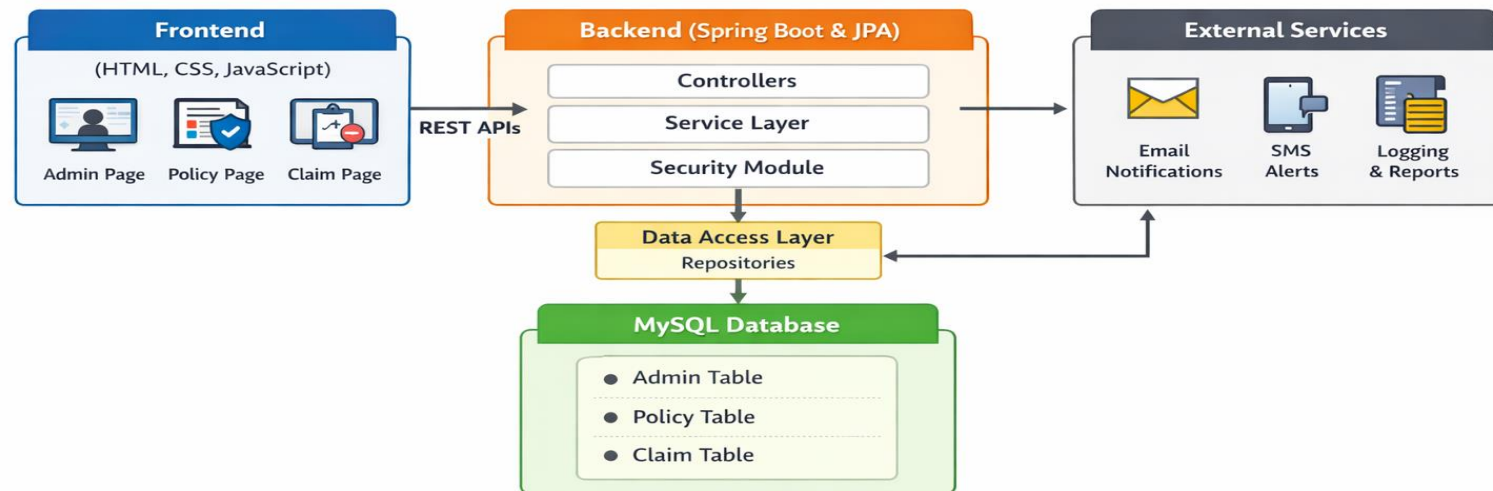
# ER DIAGRAM

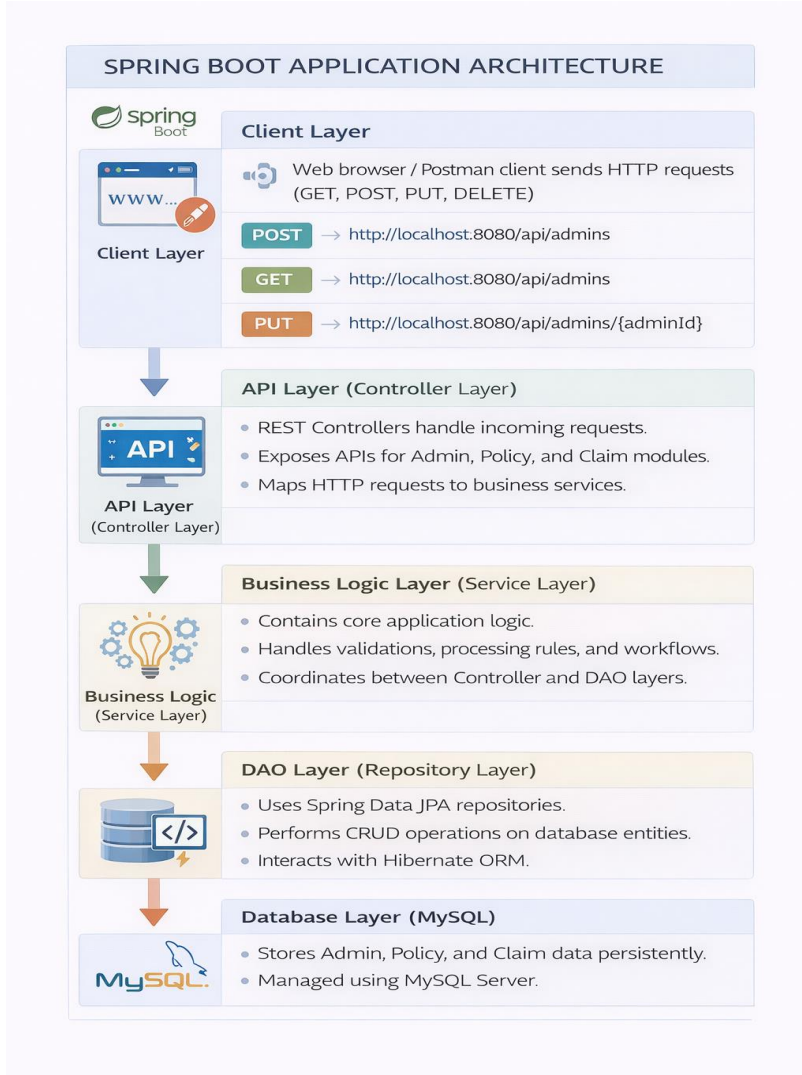


# CLIENT – SERVER ARCHITECTURE



## Insurance Claim & Management System





# SPRING BOOT APP

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## ADMIN MODULE

- Manages insurance policies and claim records.
- Performs create, update, delete, and view operations.
- Controls system access and oversees overall insurance operations.

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## POLICY MODULE

- Manages creation and maintenance of insurance policy details.
- Stores premium amount, policy type, duration, and status information.
- Allows updating and viewing of active and inactive policies.
- Ensures organized and centralized policy data management.

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## CLAIM MODULE

- Handles insurance claim requests linked to specific policies.
- Records claim amount, claim date, and current claim status.
- Supports updating and tracking claim approval or rejection.
- Maintains accurate and organized claim records for processing.

# HTTP REQUEST METHODS

METHOD	URL
ADMINS API	<b>POST</b> → http://localhost:8080/api/admins
	<b>GET</b> → http://localhost:8080/api/admins
	<b>PUT</b> → http://localhost:8080/api/admins/{adminId}
	<b>DELETE</b> → http://localhost:8080/api/admins/{adminId}
POLICIES API	<b>POST</b> → http://localhost:8080/api/policies
	<b>GET</b> → http://localhost:8080/api/policies
	<b>PUT</b> → http://localhost:8080/api/policies/{policyId}
	<b>DELETE</b> → http://localhost:8080/api/policies/{policyId}
CLAIMS API	<b>POST</b> → http://localhost:8080/api/claims
	<b>GET</b> → http://localhost:8080/api/claims
	<b>PUT</b> → http://localhost:8080/api/claims/{claimId}
	<b>DELETE</b> → http://localhost:8080/api/claims/{claimId}

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# DATA DICTIONARY



# Tables of Database

The screenshot displays the MySQL Workbench interface. The left sidebar contains a 'Navigator' pane with sections for 'MANAGEMENT' (Server Status, Client Connections, Users and Privileges, Status and System Variables, Data Export, Data Import/Restore), 'INSTANCE' (Startup / Shutdown, Server Logs, Options File), and 'PERFORMANCE' (Dashboard). Below these is an 'Information' pane showing 'No object selected'. The main workspace is titled 'Query 1' and contains the following SQL script:

```
1 • CREATE DATABASE insurance_db;
2 • USE insurance_db;
3 • SHOW TABLES;
4
```

Below the query editor, the 'Result Grid' is visible, showing the output of the 'SHOW TABLES' command:

	Tables_in_insurance_db
▶	admin
	claims
	policies

The bottom pane shows the 'Output' tab with 'Action Output' selected, displaying a log of the executed actions:

#	Time	Action	Message	Duration / Fetch
✓ 2	18:19:57	USE insurance_db	0 row(s) affected	0.016 sec
✓ 3	20:39:45	SHOW TABLES	3 row(s) returned	0.015 sec / 0.000 sec

On the right side of the interface, a message box states: 'Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.'

# Admin Database

MySQL Workbench

mysql@localhost:3306 x

File Edit View Query Database Server Tools Scripting Help

Navigator

MANAGEMENT

- Server Status
- Client Connections
- Users and Privileges
- Status and System Variables
- Data Export
- Data Import/Restore

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard

Administration Schemas

Information

No object selected

Object Info Session

Query 1 SQL File 1\*

```
1 • SELECT * FROM insurance_db.admin;
```

```
2 • show tables;
```

Limit to 1000 rows

Result Grid

	admin_id	email	password	username
2		admin1@example.com	admin123	admin1
*	NULL	NULL	NULL	NULL

Filter Rows:

Edit:

Export/Import:

Wrap Cell Content:

Result Grid

Form Editor

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Context Help Snippets

Output

Action Output

#	Time	Action	Message	Duration / Fetch
9	20:47:12	SELECT * FROM claims LIMIT 0, 1000	1 row(s) returned	0.015 sec / 0.000 sec
10	20:49:01	SELECT * FROM insurance_db.admin LIMIT 0, 1000	1 row(s) returned	0.000 sec / 0.000 sec

# Policy Database

MySQL Workbench

Navigator

- MANAGEMENT
  - Server Status
  - Client Connections
  - Users and Privileges
  - Status and System Variables
  - Data Export
  - Data Import/Restore
- INSTANCE
  - Startup / Shutdown
  - Server Logs
  - Options File
- PERFORMANCE
  - Dashboard
- Administration
  - Schemas
- Information
  - No object selected

Query 1

```
1 • SELECT * FROM insurance_db.policies;
2 • show tables;
```

Result Grid

policy_id	duration_in_years	policy_name	policy_type	premium_amount
2	2	Life Insurance	Family	7500
3	1	Health Insurance	Individual	5000
4	1	Health Insurance	Individual	5000
5	1	Health Insurance	Individual	5000
NULL	NULL	NULL	NULL	NULL

Output

Action Output

#	Time	Action	Message	Duration / Fetch
✓ 10	20:49:01	SELECT * FROM insurance_db.admin LIMIT 0, 1000	1 row(s) returned	0.000 sec / 0.000 sec
✓ 11	20:49:43	SELECT * FROM insurance_db.policies LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

# Claim Database

MySQL Workbench

Mysql@localhost:3306 x

File Edit View Query Database Server Tools Scripting Help

Navigator

MANAGEMENT

- Server Status
- Client Connections
- Users and Privileges
- Status and System Variables
- Data Export
- Data Import/Restore

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard

Administration Schemas

Information

No object selected

Object Info Session

Query 1 SQL File 1\*

Limit to 1000 rows

```
1 • SELECT * FROM insurance_db.claims;  
2 • show tables;
```

Result Grid

	claim_id	claim_amount	claim_date	claim_status	claim_type
▶	2	10000	2025-12-13	Pending	Accident
•	NULL	NULL	NULL	NULL	NULL

claims 3 x

Output

Action Output

#	Time	Action	Message	Duration / Fetch
✓ 11	20:49:43	SELECT * FROM insurance_db.policies LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
✓ 12	20:50:14	SELECT * FROM insurance_db.claims LIMIT 0, 1000	1 row(s) returned	0.000 sec / 0.000 sec

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

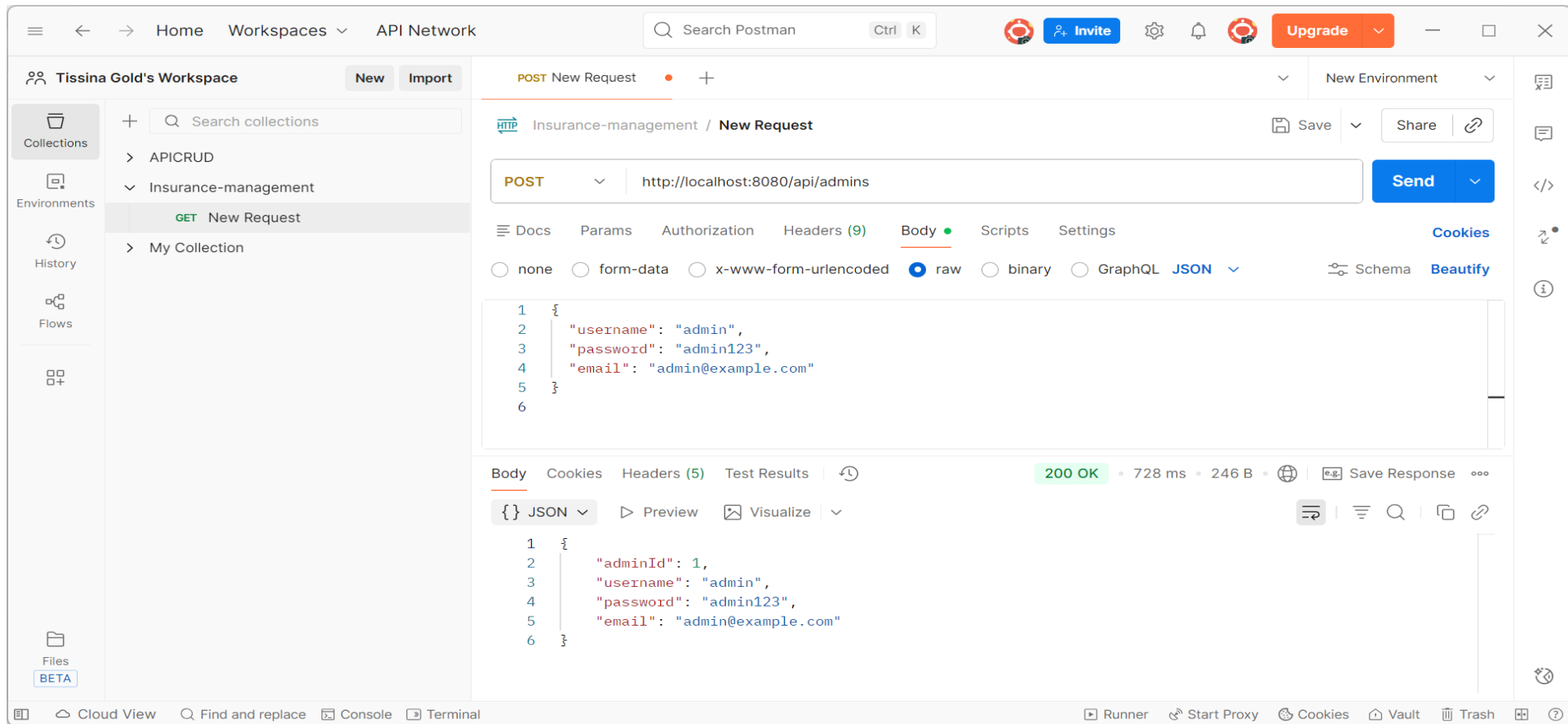
Result Grid

Form Editor

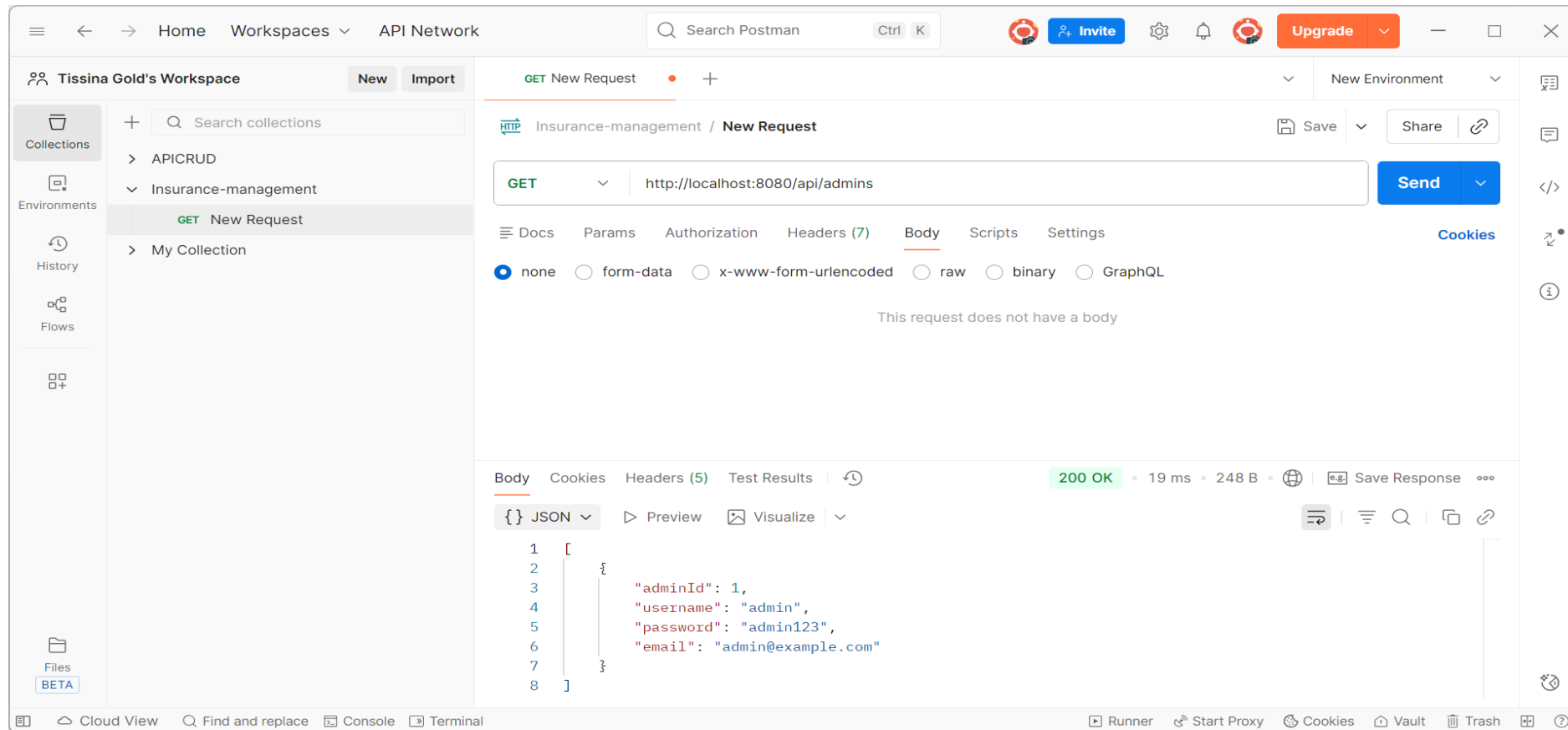
Context Help Snippets

Apply Revert

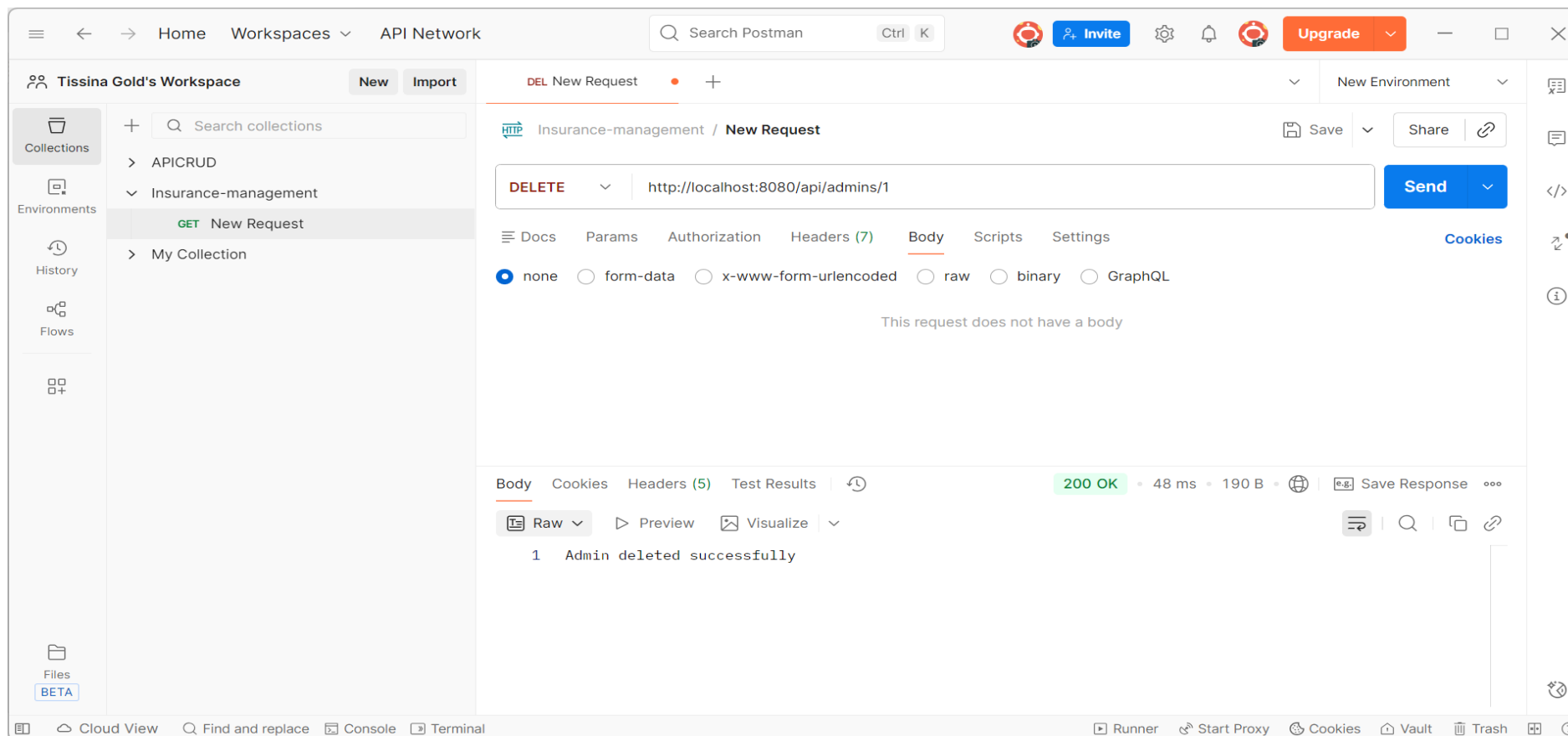
# POST METHOD - ADMIN



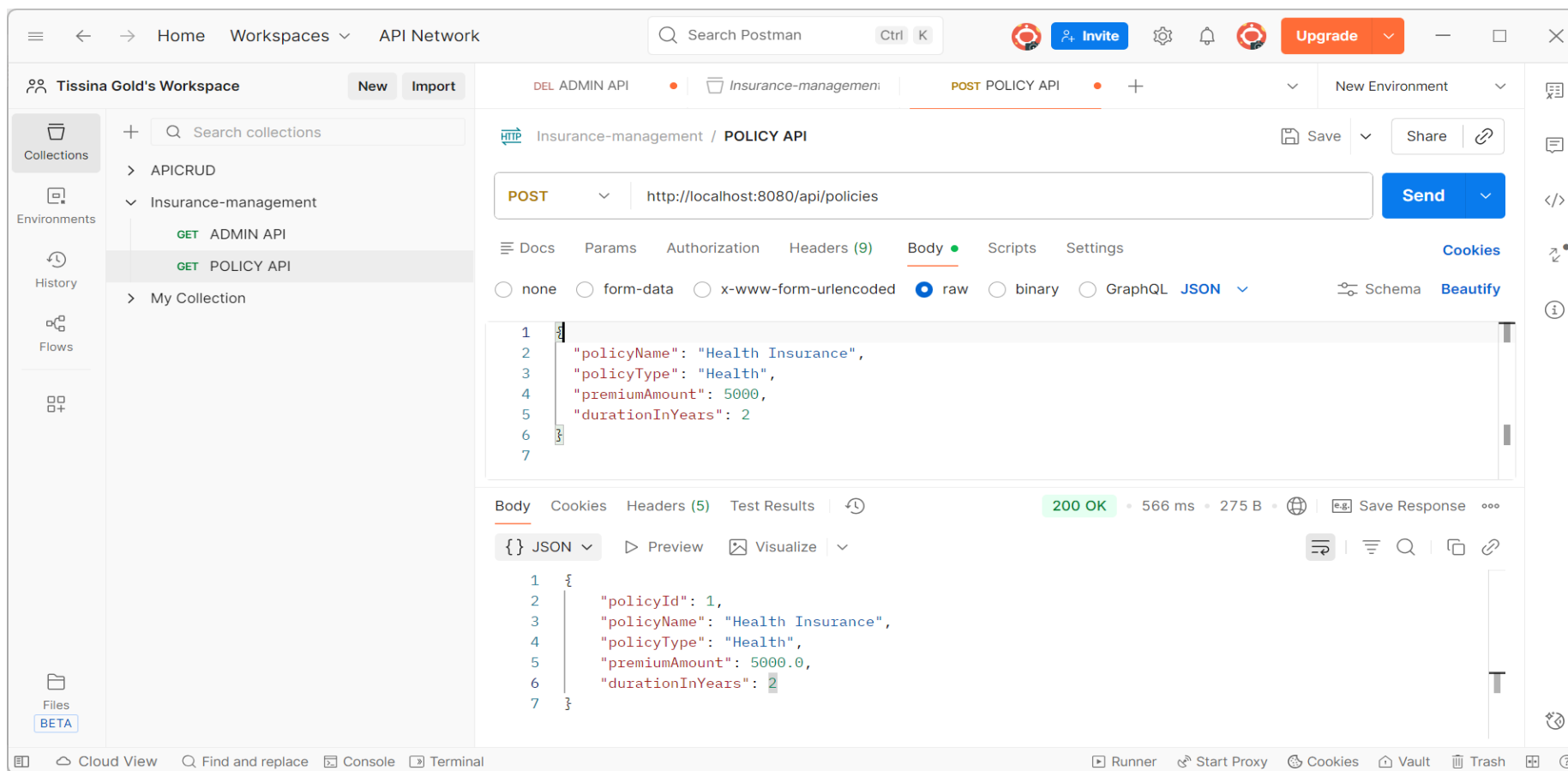
# GET METHOD - ADMIN



# DELETE METHOD - ADMIN

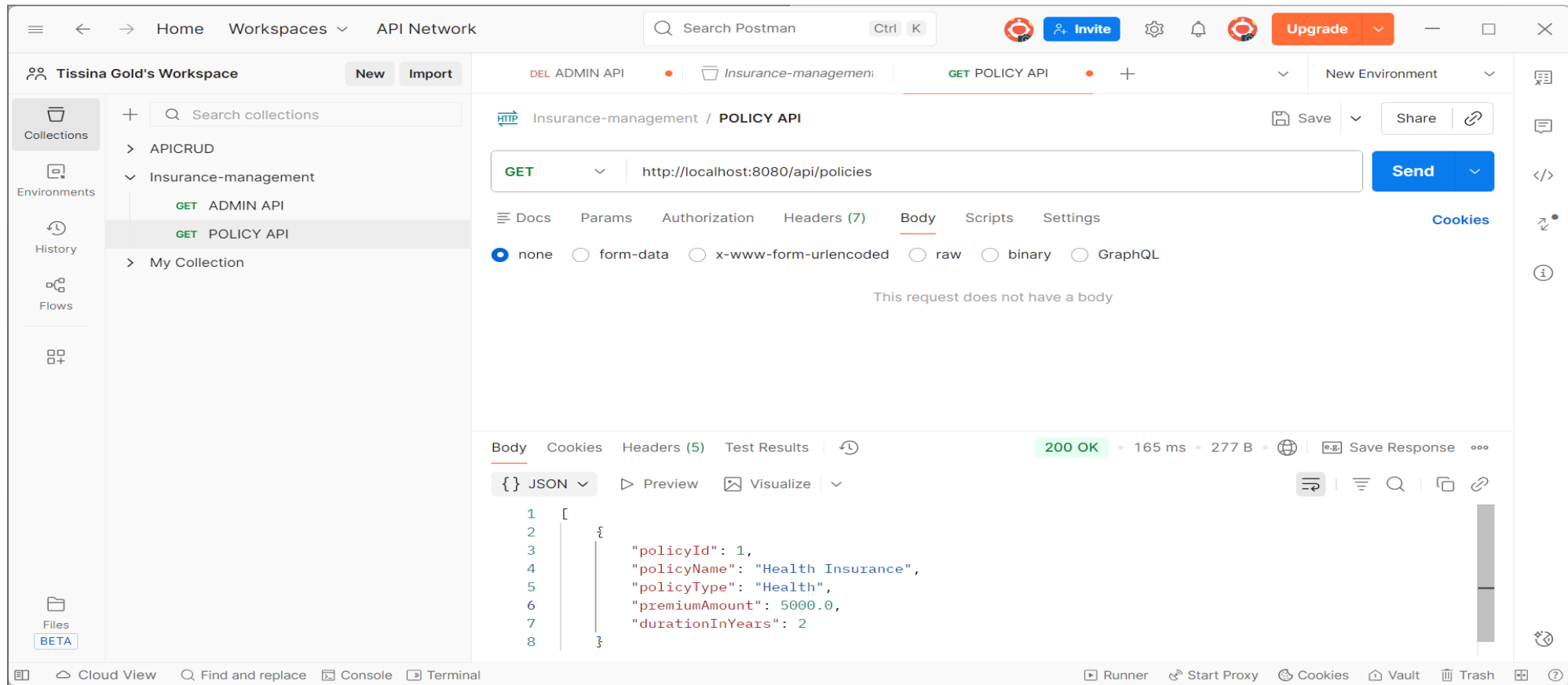


# POST METHOD - POLICY

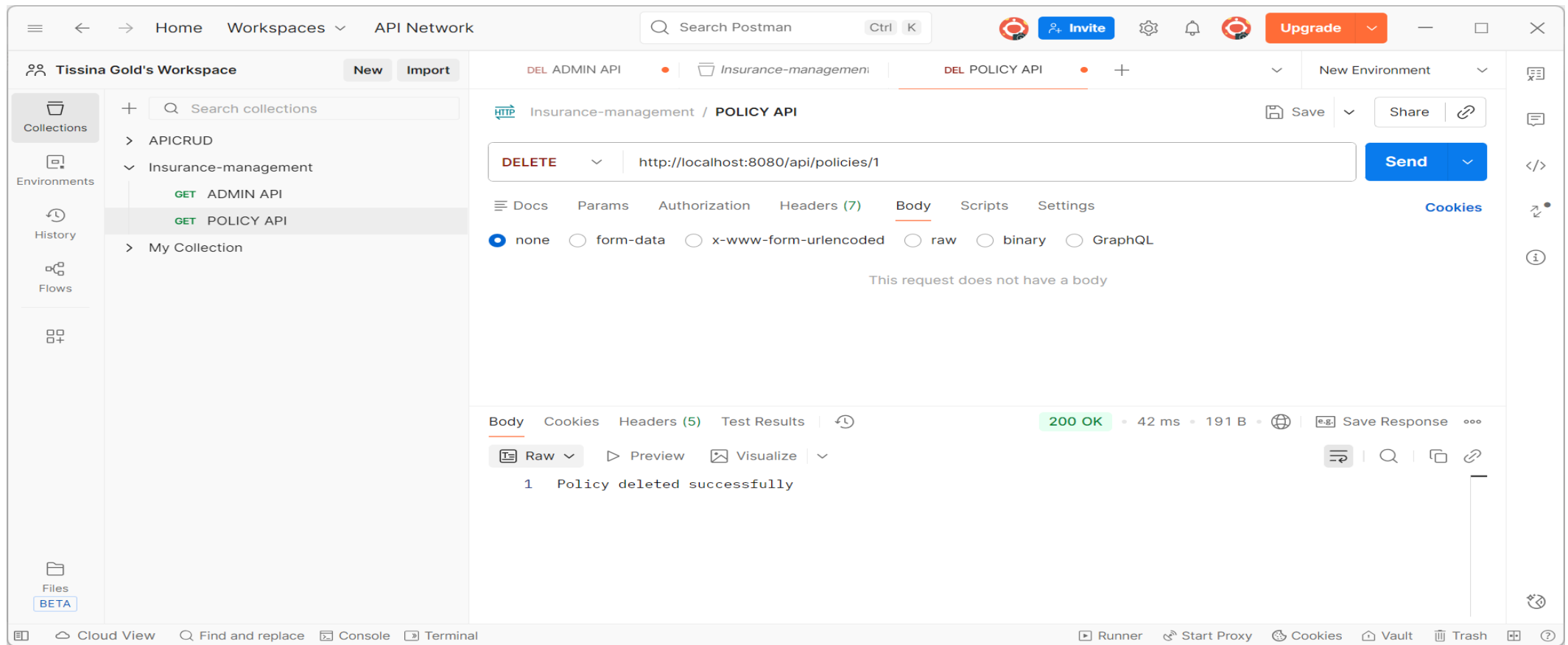




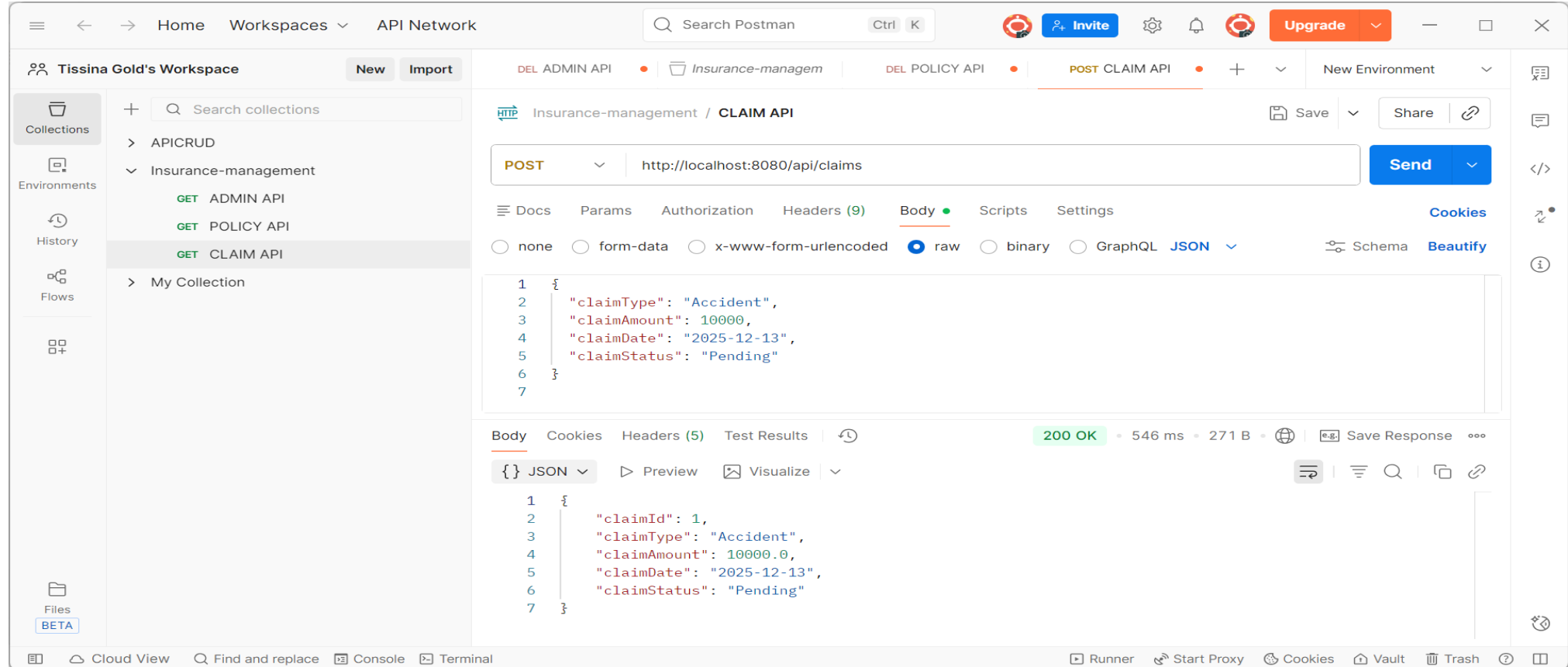
# GET METHOD - POLICY



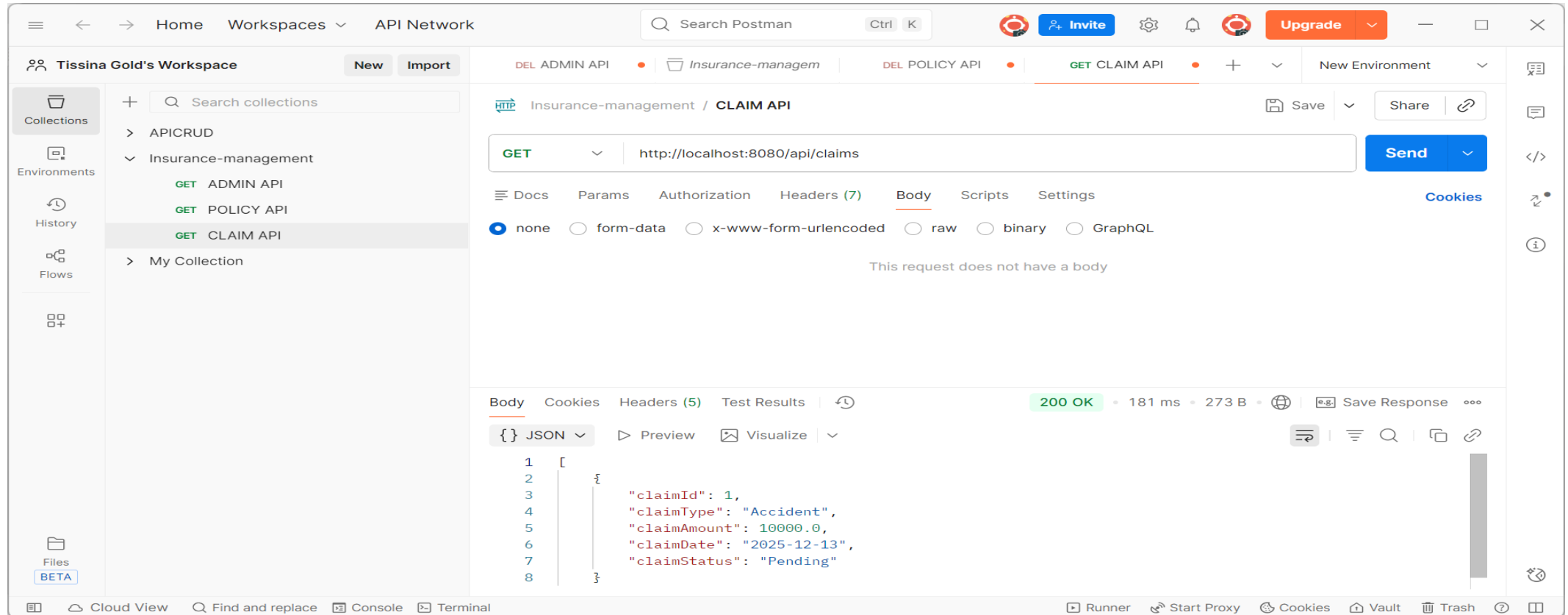
# DELETE METHOD - POLICY



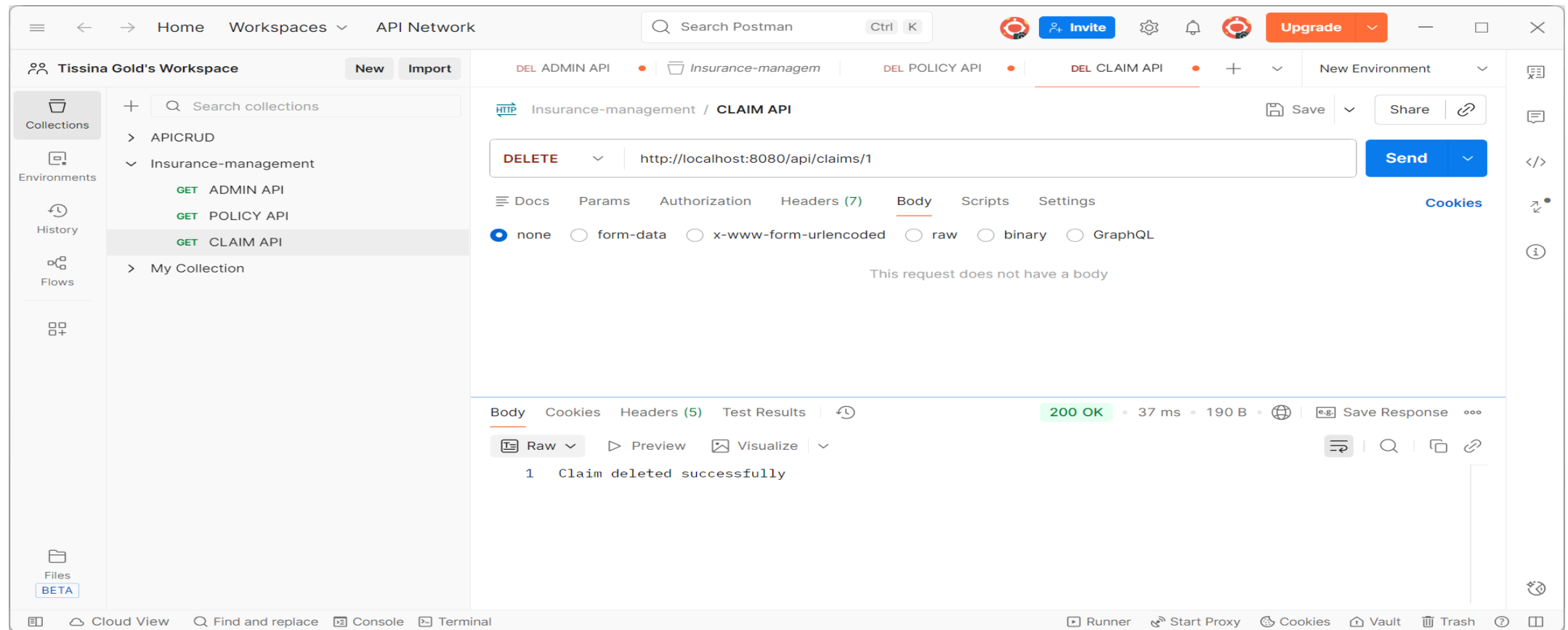
# POST METHOD - CLAIM



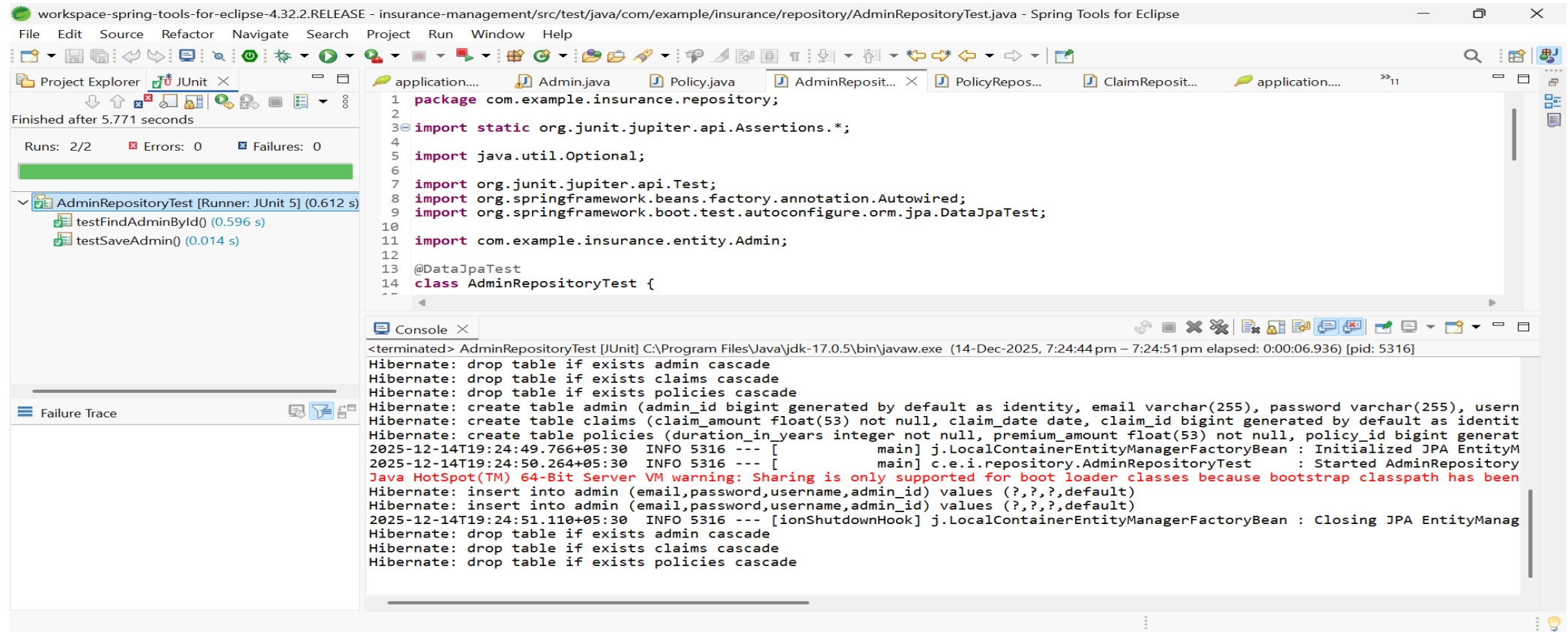
# GET METHOD - CLAIM



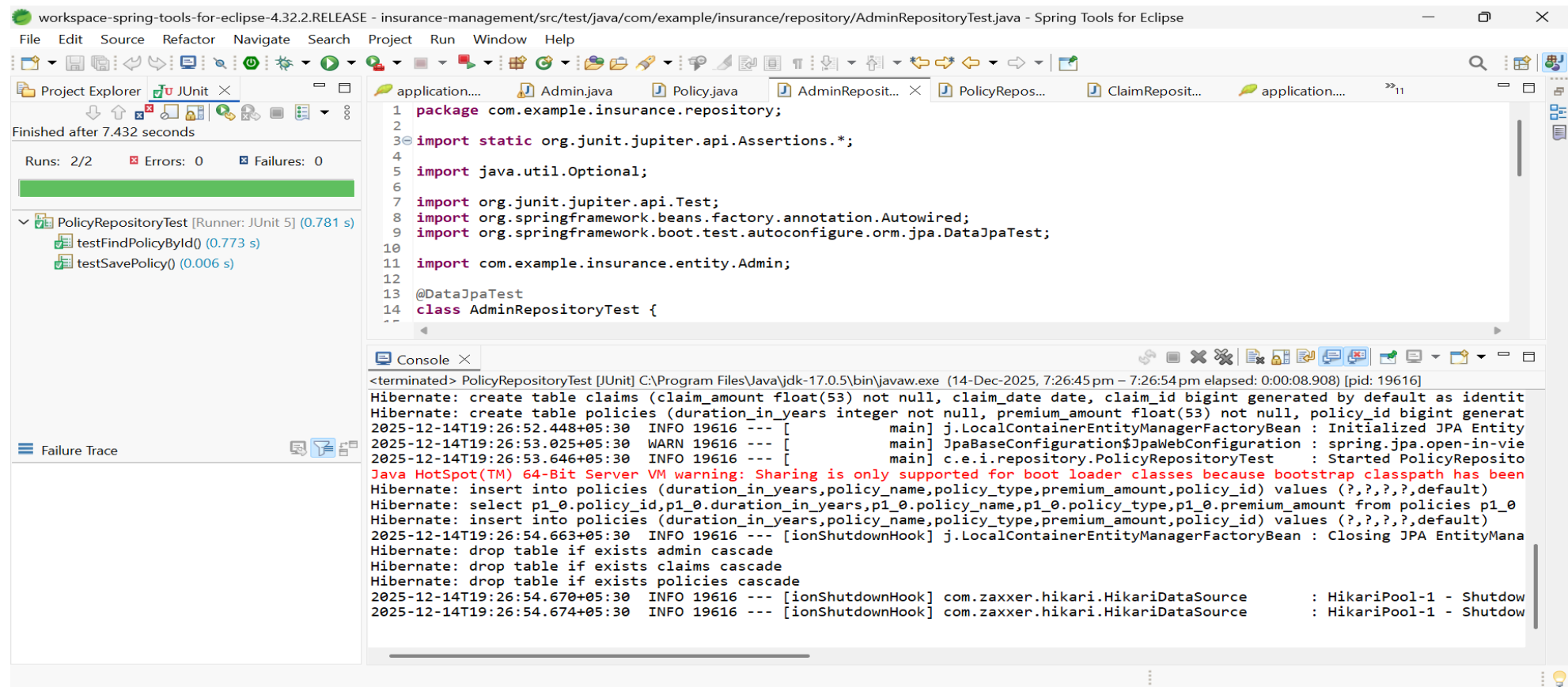
# DELETE METHOD - CLAIM



# JUNIT TEST CASE - ADMIN



# JUNIT TEST CASE - POLICY



```
workspace-spring-tools-for-eclipse-4.32.2.RELEASE - insurance-management/src/test/java/com/example/insurance/repository/AdminRepositoryTest.java - Spring Tools for Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer JUnit X
Finished after 7.432 seconds
Runs: 2/2 Errors: 0 Failures: 0
PolicyRepositoryTest [Runner: JUnit 5] (0.781 s)
  testFindPolicyById() (0.773 s)
  testSavePolicy() (0.006 s)
application... Admin.java Policy.java AdminReposit... PolicyRepos... ClaimReposit... application... >>11
1 package com.example.insurance.repository;
2
3 import static org.junit.jupiter.api.Assertions.*;
4
5 import java.util.Optional;
6
7 import org.junit.jupiter.api.Test;
8 import org.springframework.beans.factory.annotation.Autowired;
9 import org.springframework.boot.test.autoconfigure.orm.jpa.DataJpaTest;
10
11 import com.example.insurance.entity.Admin;
12
13 @DataJpaTest
14 class AdminRepositoryTest {
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```

# JUNIT TEST CASE - CLAIM

The screenshot displays the Eclipse IDE interface for a Spring project. The top toolbar shows various development tools. The Project Explorer on the left shows the project structure, including the 'ClaimRepositoryTest' class. The JUnit runner on the left shows the test results, indicating that the tests passed successfully. The main editor window displays the source code for 'AdminRepositoryTest.java'. The code includes imports for JUnit, Spring, and Hibernate, and defines the 'AdminRepositoryTest' class. The Console window at the bottom shows the output of the test run, including database schema creation and test execution logs.

```
workspace-spring-tools-for-eclipse-4.32.2.RELEASE - insurance-management/src/test/java/com/example/insurance/repository/AdminRepositoryTest.java - Spring Tools for Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer JUnit X
Finished after 5.856 seconds
Runs: 2/2 Errors: 0 Failures: 0
ClaimRepositoryTest [Runner: JUnit 5] (0.687 s)
  testSaveClaim() (0.660 s)
  testFindClaimById() (0.025 s)
application... Admin.java Policy.java AdminReposit... PolicyRepos... ClaimReposit... application... »11
1 package com.example.insurance.repository;
2
3 import static org.junit.jupiter.api.Assertions.*;
4
5 import java.util.Optional;
6
7 import org.junit.jupiter.api.Test;
8 import org.springframework.beans.factory.annotation.Autowired;
9 import org.springframework.boot.test.autoconfigure.orm.jpa.DataJpaTest;
10
11 import com.example.insurance.entity.Admin;
12
13 @DataJpaTest
14 class AdminRepositoryTest {
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