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Capstone Project

Personal BACKGROUND

(Name, Past Experience, Qualification, Career Summary)

Name : Swarna Sai Sreekar

Past Experience : Experience in previous Trainings with MERN stack, Spring Boot and GEN-AI Training

Qualification : Bachelor of Technology in CSE

Career Summary : To work in a dynamic environment that uses my skills and expertise in process of growth and development while allowing me to learn and enrich my competencies

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Key Takeaways/Learnings from the Program (HTD)

During my two-month training at Ascendion, I gained in-depth knowledge and practical experience in several key areas :

- **End-to-End Quality Engineering (QE) Expertise**
  Skilled in manual and automation testing across functional, performance, and security domains, with strong test design and execution practices.
- **Full-Stack Test Automation**
  Hands-on experience building scalable Selenium WebDriver frameworks with Java, TestNG, POM, Log4j, and Maven for CI/CD pipelines.
- **API Automation & Integration**
  Proficient in REST API testing using Postman and Newman CLI, validating responses and integrating with Jenkins for automation.
- **Performance Testing**
  Created JMeter scripts simulating realistic load scenarios with CLI-based execution and reporting for API and web performance.
- **Agile Testing with Jira & Xray**
  Managed testing workflows in Jira Scrum boards, including sprint planning, bug tracking, and test executions using Xray.
- **DevOps & CI/CD Testing**
  Implemented Shift-Left and Shift-Right strategies integrated with Jenkins, GitHub Actions, and SonarQube for continuous quality feedback.
- **Exploratory, Non-Functional & Mobile Testing**
  Experienced in mobile automation using Appium on real devices and simulators.

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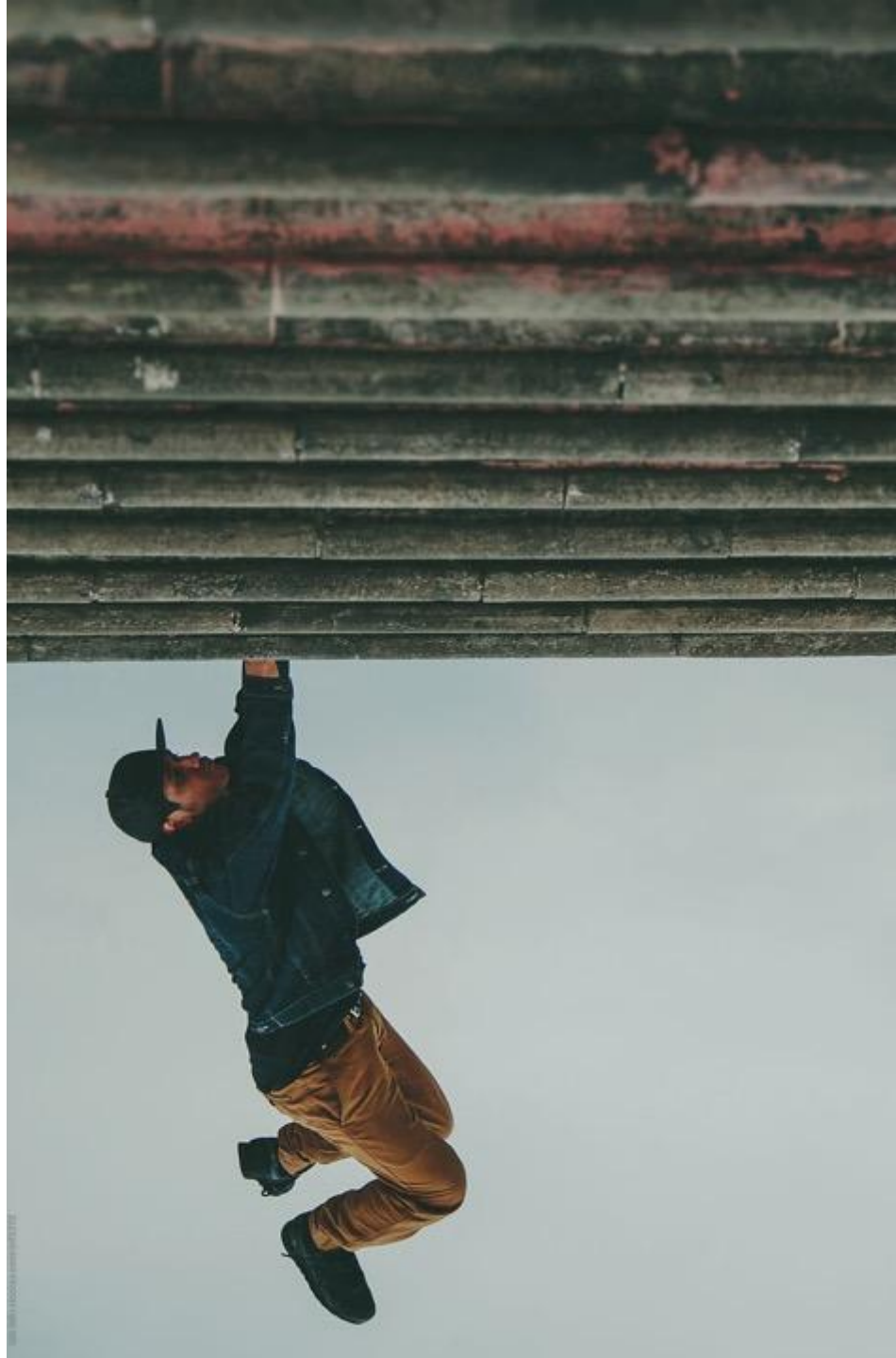
Problem Statement of the Capstone Project

- Demonstrate end-to-end Quality Engineering skills with automated testing for web and APIs.
- Develop scalable Selenium WebDriver UI tests using Page Object Model, logging, and assertions.
- Create Postman API automation collections and run via Newman locally and in CI/CD.
- Manage test execution, reporting, and tracking using Jira and Xray.
- Optionally implement mobile automation (Appium) and performance testing (JMeter).
- Integrate tests and code into GitHub with branching strategies.
- Optionally configure Jenkins pipelines for automated test execution.
- Ensure robust, flexible, and maintainable automation supporting agile and DevOps workflows.



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Reference Links :

Links

🔗 **Web Application**

- https://demoqa.com/

🔗 **API Base URL**

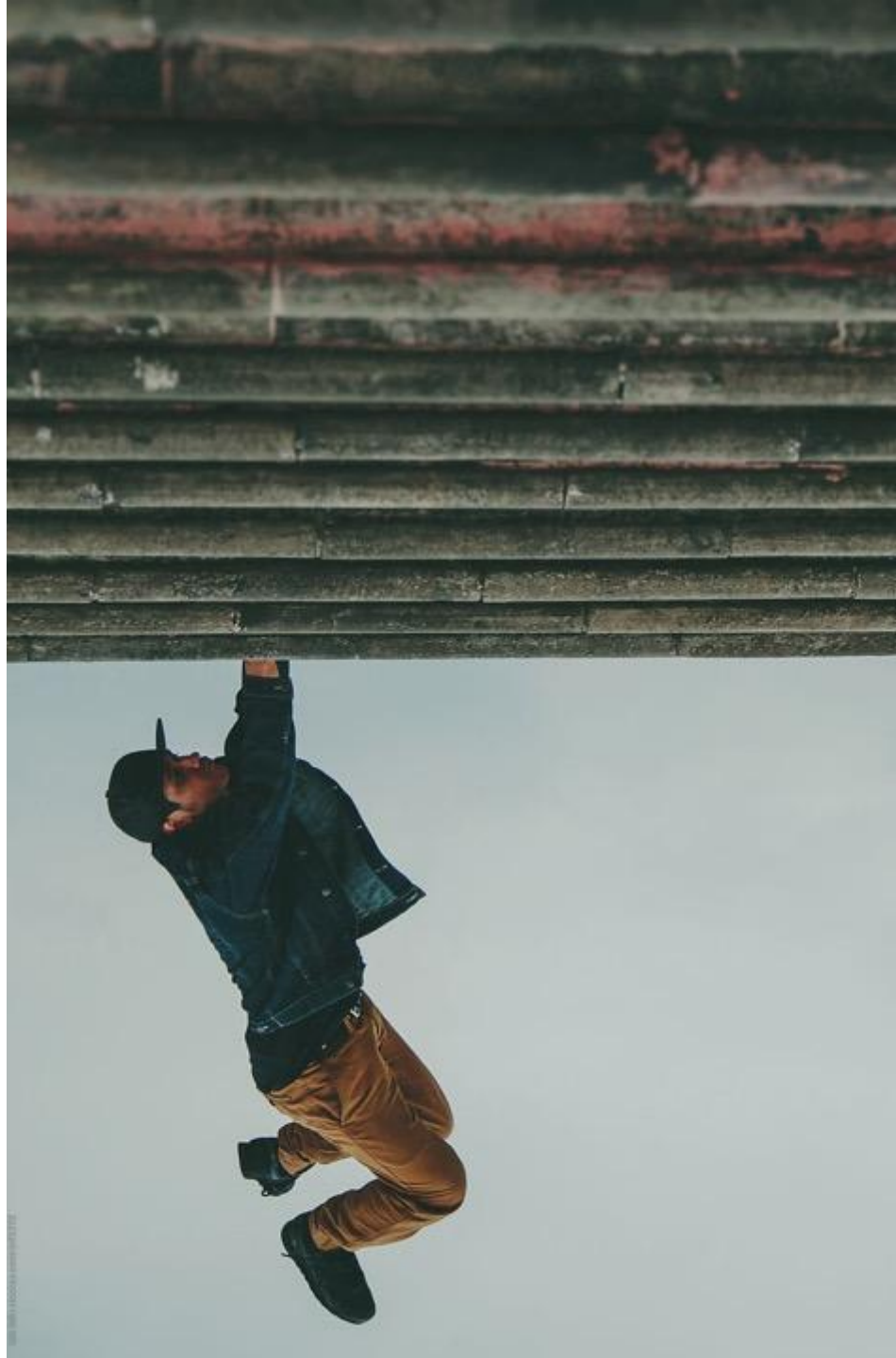
- https://api.restful-api.dev/objects

🔗 **GitHub Repository**

- https://github.com/sreekar0122/CAPSTONE_COGNIXIA_WEB_API_MAY2025

🔗 **JIRA or Documentation (Optional)**

- https://ascendionlearning.atlassian.net/jira/software/c/projects/SR/summary



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Login Functionality Page & Test of the Selenium project with screenshots

```java
    public LoginPage(WebDriver driver) {
        this.driver = driver;
        PageFactory.initElements(driver, this);
    }

    @FindBy(id = "userName")
    WebElement username;

    @FindBy(id = "password")
    WebElement password;

    @FindBy(id = "login")
    WebElement loginBtn;

    @FindBy(id = "name")
    WebElement loginMessage;

    public void enterUsername(String user) {
        username.clear();
        username.sendKeys(user);
    }

    public void enterPassword(String pass) {
        password.clear();
        password.sendKeys(pass);
    }

    public void clickLogin() {
        loginBtn.click();
    }

    public String getLoggedInUsername() {
        return driver.findElement(By.id("userName-value")).getText();
    }

    public String getLoginMessage() {
        return loginMessage.getText();
    }
```

```java
    @Test(priority = 1)
    Run | Debug
    public void loginWithInvalidCredentials() throws InterruptedException {
        driver.get(constant.LOGIN_PAGE_URL);
        LoginPage loginPage = new LoginPage(driver);

        loginPage.enterUsername(constant.INVALID_USERNAME);
        loginPage.enterPassword(constant.INVALID_PASSWORD);
        loginPage.clickLogin();

        Thread.sleep(1000);

        Assert.assertTrue(
            loginPage.getLoginMessage().contains(constant.INVALID_LOGIN_MSG),
            "Invalid login warning not displayed."
        );
        log.info("Invalid login tested successfully.");
    }

    @Test(priority = 2)
    Run | Debug
    public void loginWithWrongUsername() throws InterruptedException {
        driver.get(constant.LOGIN_PAGE_URL);
        LoginPage loginPage = new LoginPage(driver);

        loginPage.enterUsername(constant.WRONG_USERNAME);
        loginPage.enterPassword(constant.VALID_PASSWORD);
        loginPage.clickLogin();

        Thread.sleep(1000);

        Assert.assertTrue(
            loginPage.getLoginMessage().contains(constant.INVALID_LOGIN_MSG),
            "Wrong username test failed."
        );
        log.info("Wrong username login tested successfully.");
    }
```

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Test Base Before & After Method, Config.properties, TestNG.xml of the Selenium project

```java
public class TestBase {
    public WebDriver driver;
    public static Properties prop = new Properties(); // Ensure it's initialized
    public Logger log = Logger.getLogger(TestBase.class);

    // Load config just once
    static {
        try {
            FileInputStream fis = new FileInputStream("testdata/config.properties");
            prop.load(fis);
            PropertyConfigurator.configure("testdata/log4j.properties");
        } catch (IOException e) {
            e.printStackTrace();
            throw new RuntimeException("Failed to load config properties.");
        }
    }

    @BeforeMethod
    public void setup() {
        String browser = prop.getProperty("browser", "chrome");
        String headless = prop.getProperty("headless", "false");

        if (browser.equalsIgnoreCase("chrome")) {
            ChromeOptions options = new ChromeOptions();
            if (Boolean.parseBoolean(headless)) {
                options.addArguments("--headless=new", "--disable-gpu");
            }
            driver = new ChromeDriver(options);
        } else if (browser.equalsIgnoreCase("edge")) {
            EdgeOptions options = new EdgeOptions();
            if (Boolean.parseBoolean(headless)) {
                options.addArguments("--headless=new", "--disable-gpu");
            }
            driver = new EdgeDriver(options);
        } else {
            driver = new ChromeDriver(); // default
        }
```

```java
    @AfterMethod
    public void tearDown(ITestResult result) throws Exception {
        if (ITestResult.FAILURE == result.getStatus()) {
            takeScreenshot(result.getName());
            log.error("Test Failed: " + result.getName());
        }
        driver.quit();
    }

    public void takeScreenshot(String name) throws IOException {
        TakesScreenshot ts = (TakesScreenshot) driver;
        File src = ts.getScreenshotAs(OutputType.FILE);
        File dest = new File("screenshot/" + name + ".png");
        FileUtils.copyFile(src, dest);
    }
}
```

```
browser=edge
headless=true
```

```xml
<?xml version="1.0" encoding="UTF-8"?>
Bind to grammar/schema...
<suite name="Suite">
  <test thread-count="5" name="Test">
    <classes>
      <class name="tests.LoginTest"/>
      <class name="tests.SearchTest"/>
      <class name="tests.FormSubmissionTest"/>
      <class name="tests.ExtraFunctionalityTest"/>
    </classes>
  </test> <!-- Test -->
</suite> <!-- Suite -->
```

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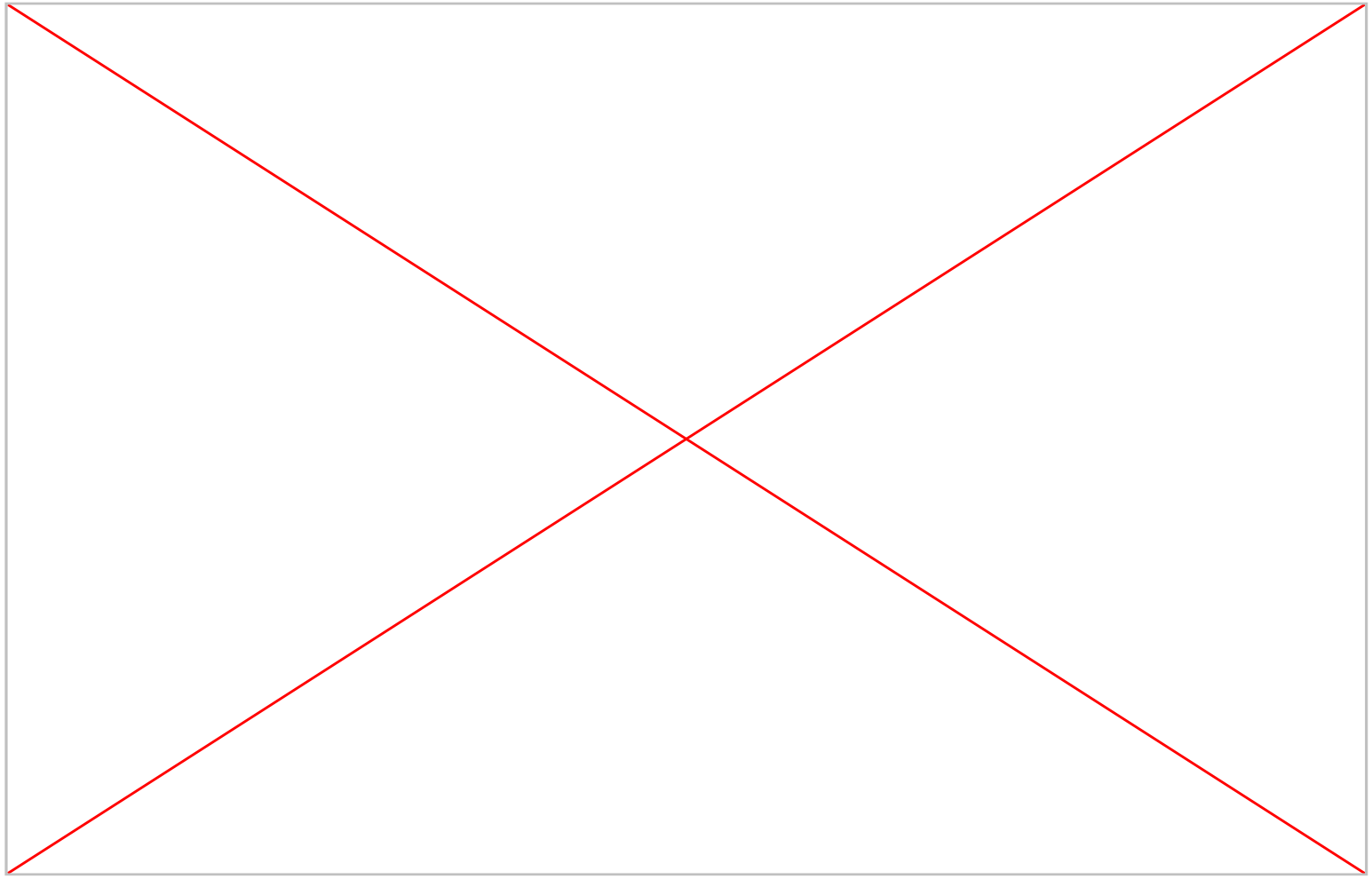
Selenium Form Submission Test Video



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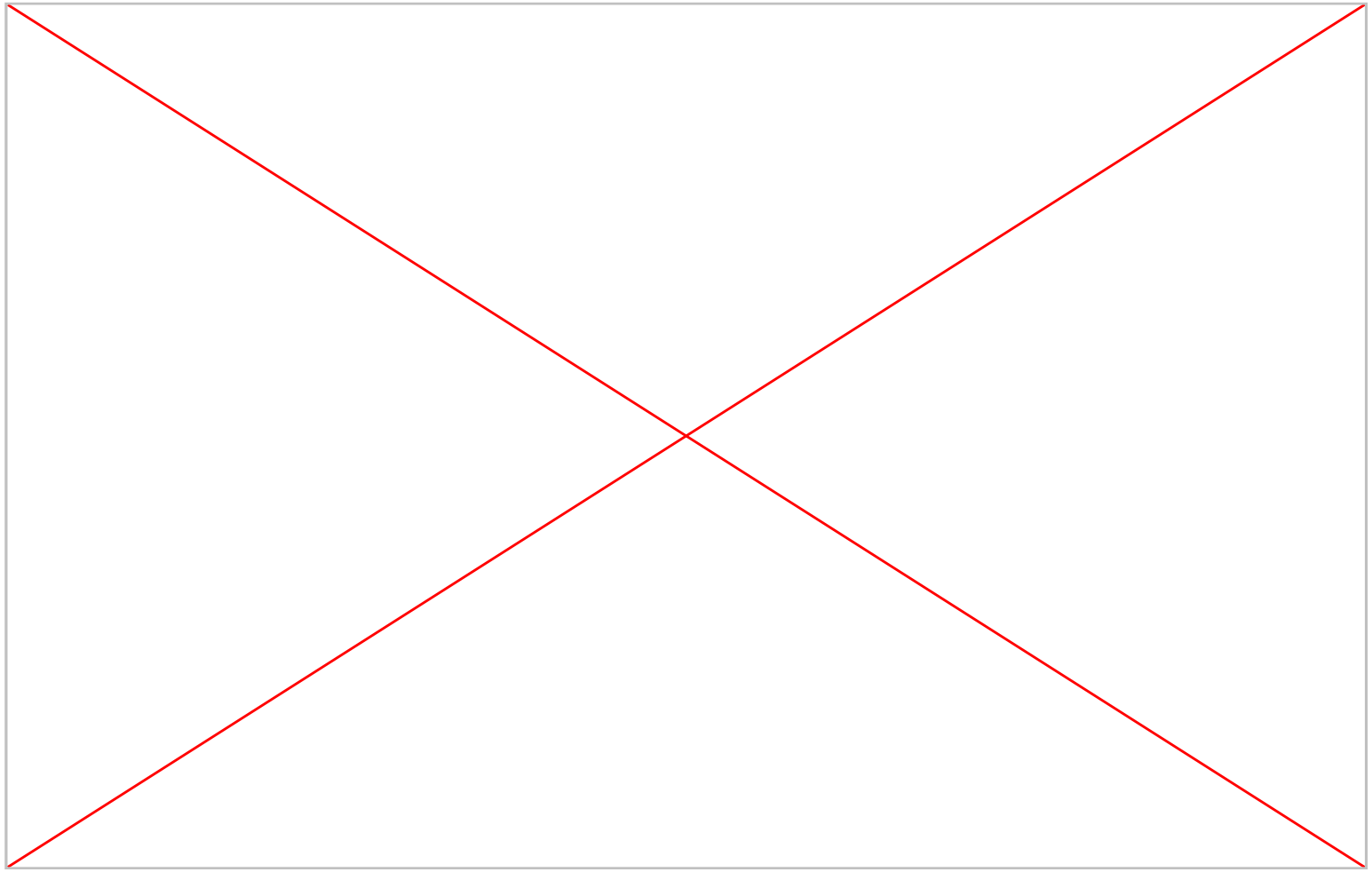
API Postman Test Video



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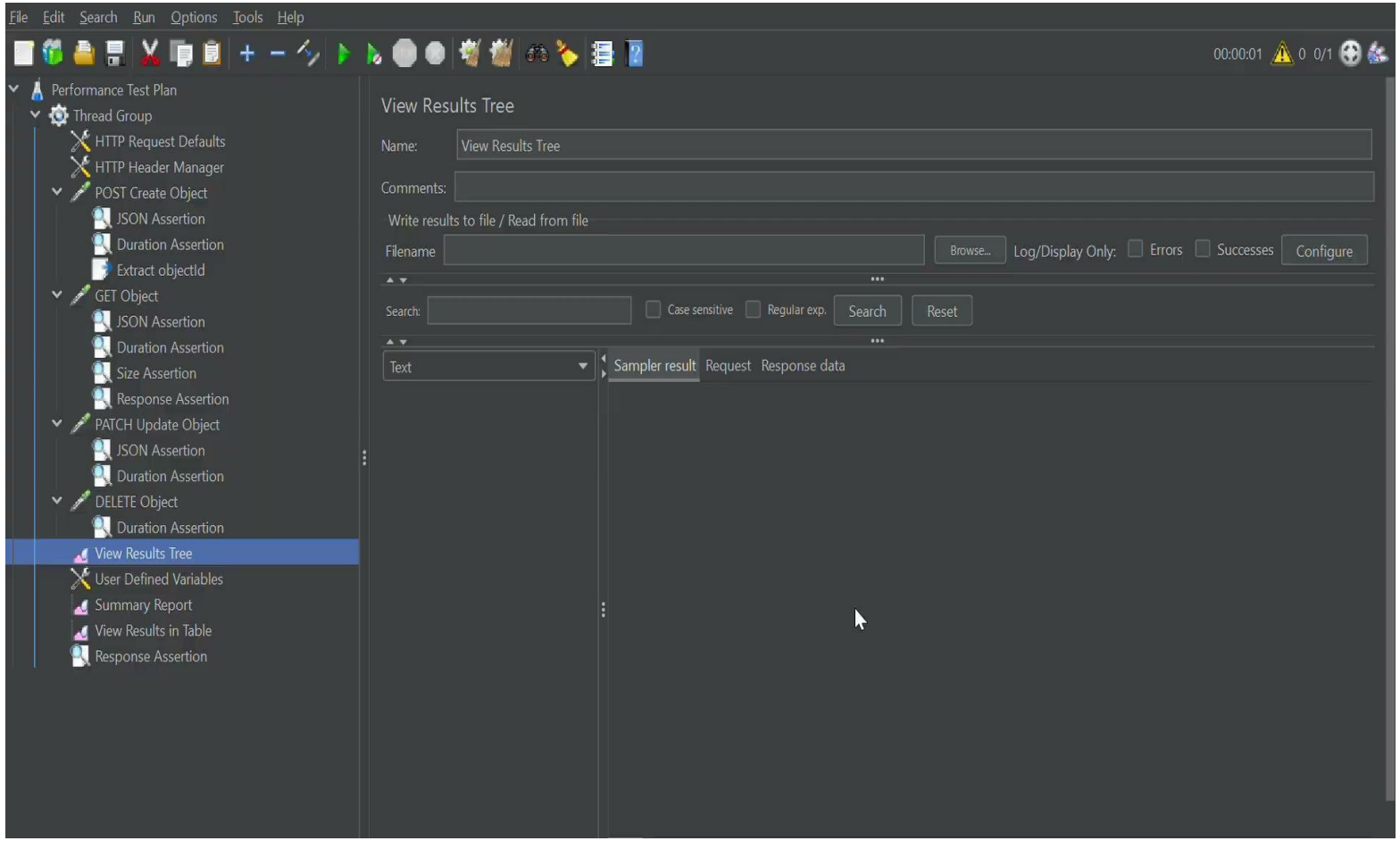
JMeter api.restful-dev Test Video



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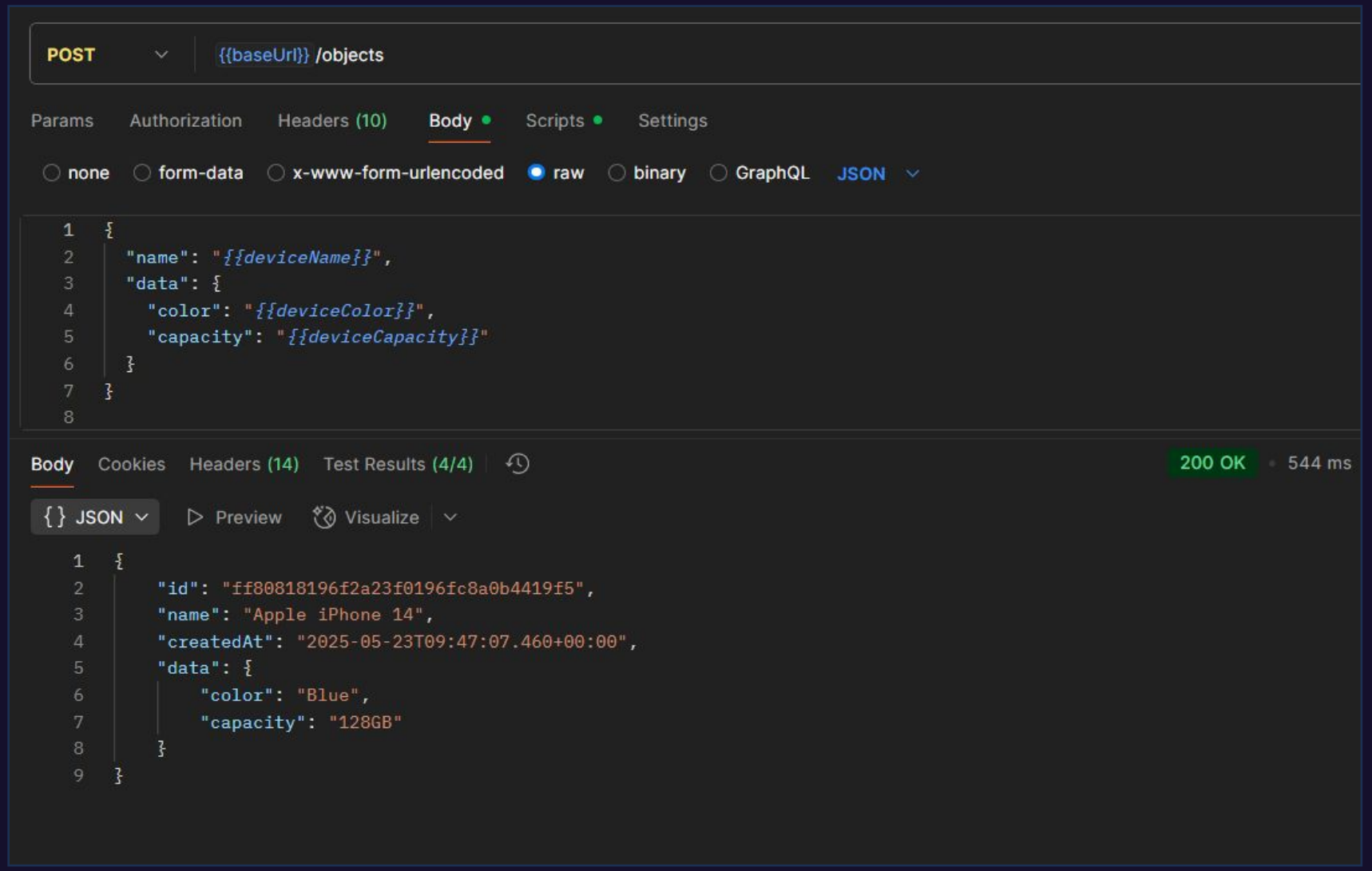
Postman Request Methods, Responses of the API(api.restful-dev) with screenshots



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Postman Request Methods, Validations of the API(api.restful-dev) with screenshots

Environmental Variables

	Variable	Type	Initial value	Current value
☑	objectId	default		ff80818196f2a23f0196fc8a0b4419f5
☑	baseUrl	default	https://api.restful-api.dev	https://api.restful-api.dev

Collection Variables

	Variable	Initial value	Current value
☑	deviceName	Apple iPhone 14	Apple iPhone 14
☑	deviceColor	Blue	Blue
☑	deviceCapacity	128GB	128GB

Validation Scripts

GET {{baseUrl}} /objects/ {{objectId}}

Params Authorization Headers (7) Body Scripts Settings

Pre-request

Post-response

```
pm.test("Status code is 200", () => pm.response.to.have.status(200));
pm.test("Body includes device name", () => {
  pm.expect(pm.response.text()).to.include(pm.collectionVariables.get("deviceName"));
});
pm.test("Response time < 2000ms", () => pm.expect(pm.response.responseTime).to.be.below(2000));
pm.test("Content-Type is JSON", () => pm.response.to.have.header("Content-Type"));
```

Body Cookies Headers (14) Test Results (4/4) 200 OK

Filter Results

PASSED Status code is 200

PASSED Body includes device name

PASSED Response time < 2000ms

PASSED Content-Type is JSON

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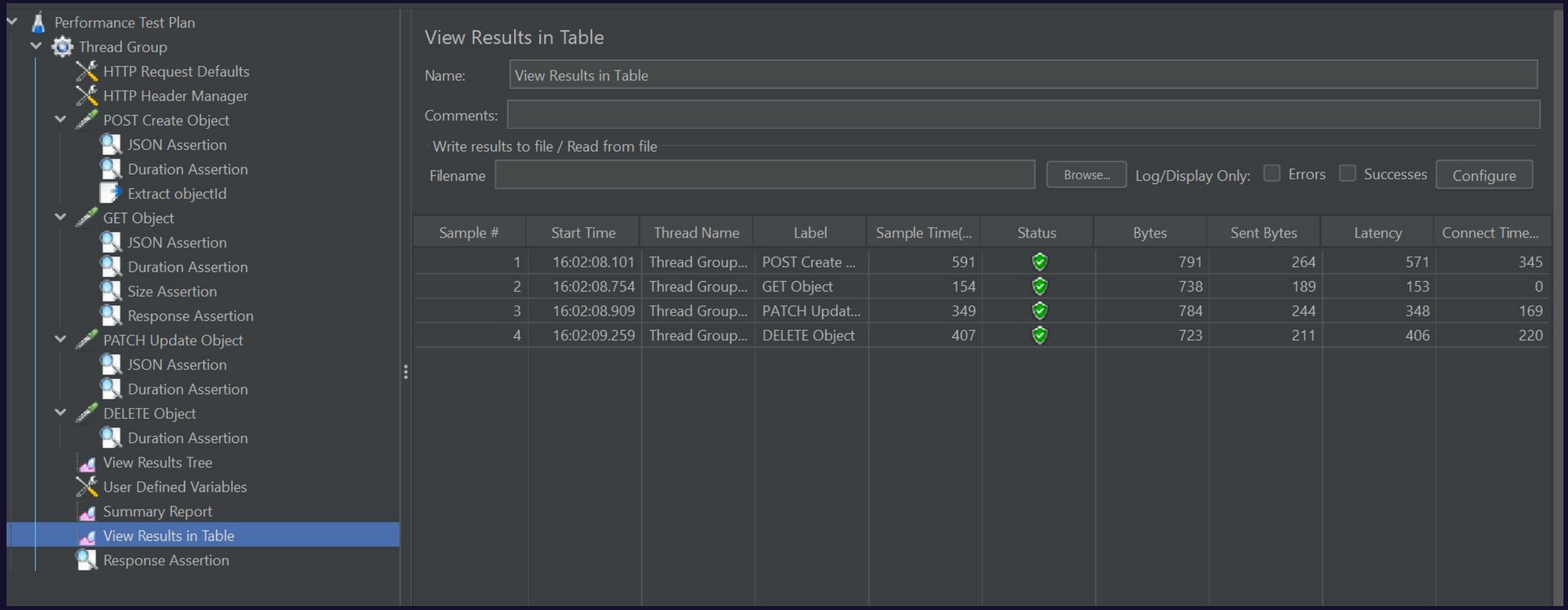
Responses of the API(api.restful-dev) of the JMeter with Result Table



Sample #	Start Time	Thread Name	Label	Sample Time(...	Status	Bytes	Sent Bytes	Latency	Connect Time...
1	16:02:08.101	Thread Group...	POST Create ...	591		791	264	571	345
2	16:02:08.754	Thread Group...	GET Object	154		738	189	153	0
3	16:02:08.909	Thread Group...	PATCH Updat...	349		784	244	348	169
4	16:02:09.259	Thread Group...	DELETE Object	407		723	211	406	220

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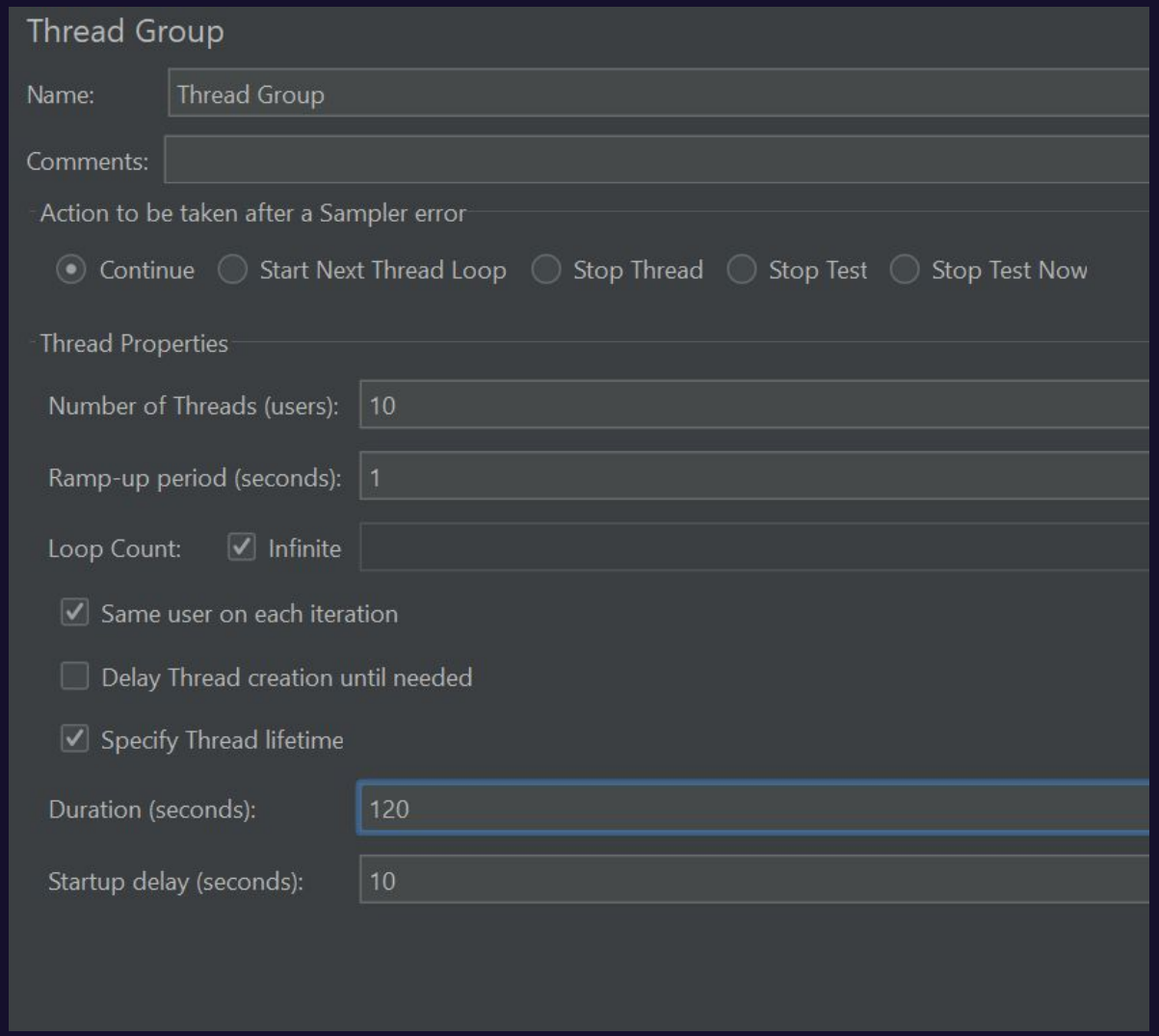
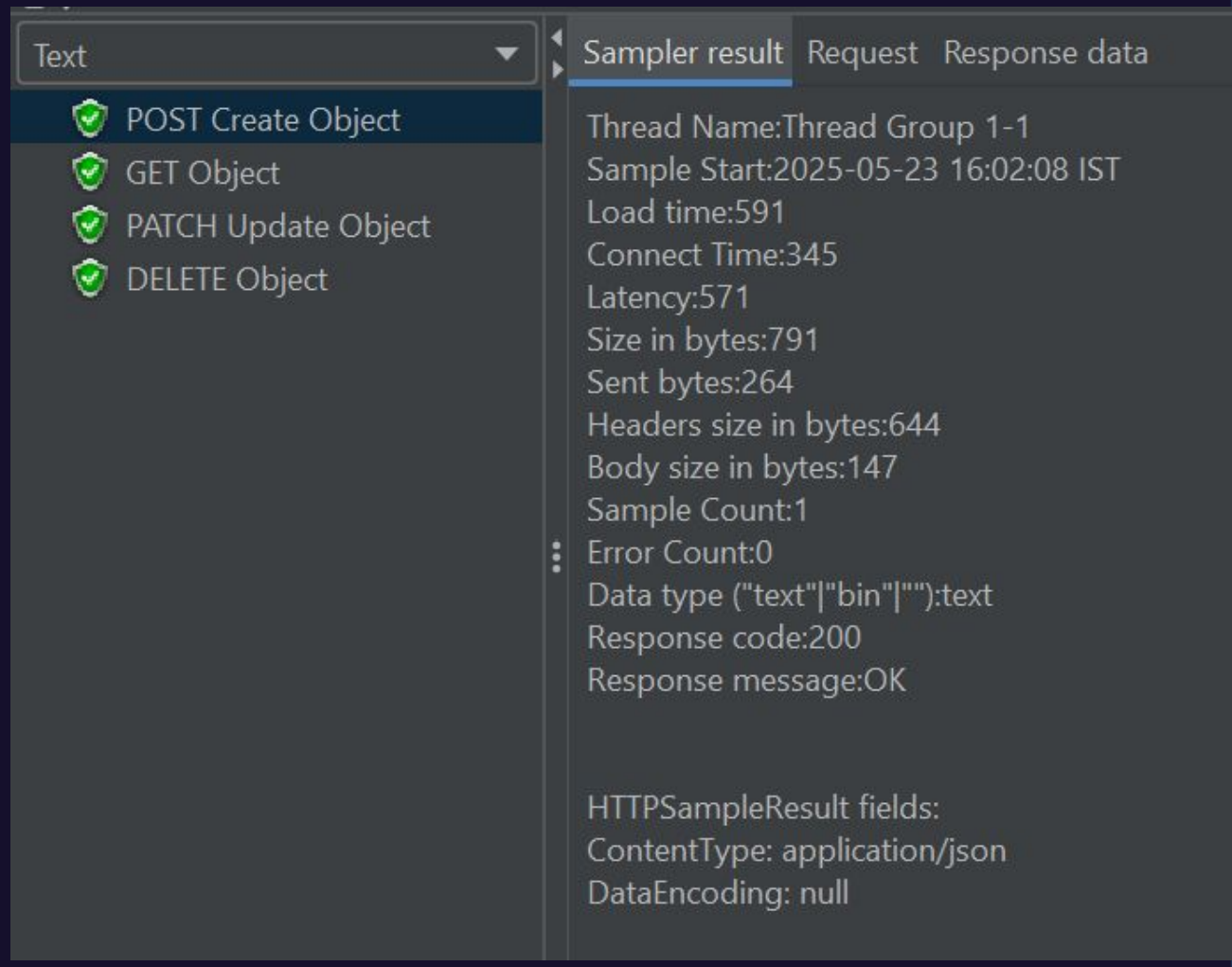
Responses of the API(api.restful-dev) of the Thread Group & Result Tree





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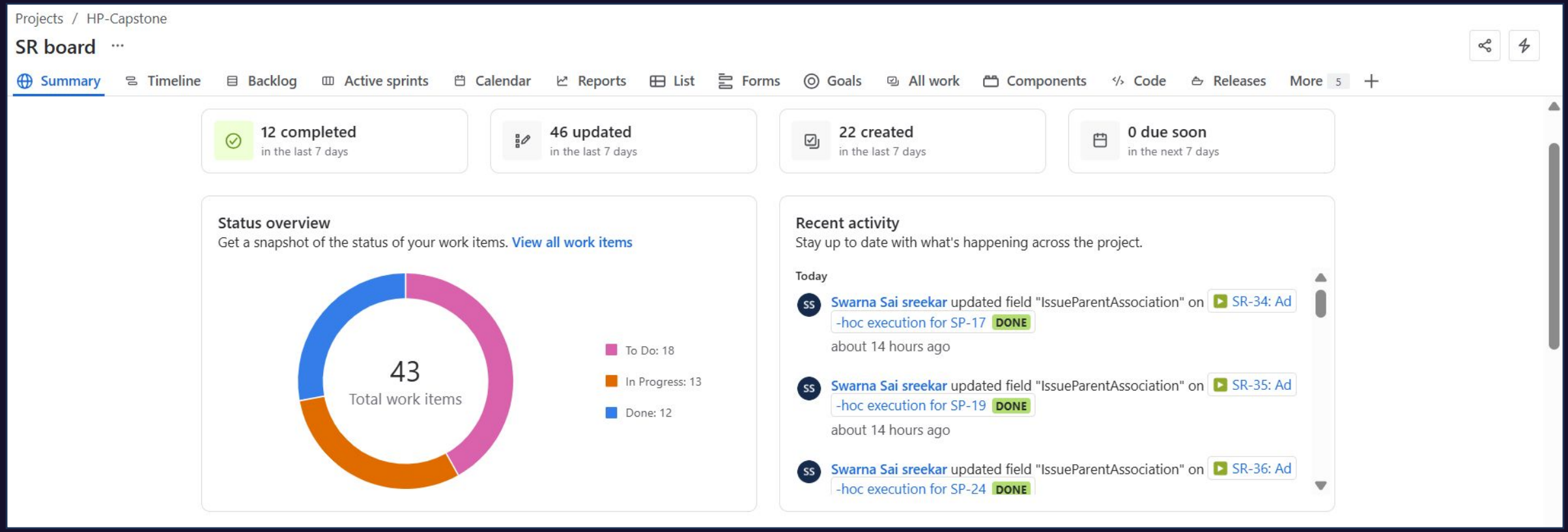
HP-Capstone(SR) Summary in SR - JIRA - Board



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Conclusion

- Gained comprehensive Quality Engineering skills across manual, automation, API, mobile, and performance testing.
- Developed and maintained scalable test automation frameworks using industry tools and best practices.
- Integrated testing solutions within agile workflows and CI/CD pipelines for continuous quality assurance.
- Managed end-to-end test execution, reporting, and defect tracking effectively using Jira and Xray.
- Applied DevOps testing strategies like Shift-Left and Shift-Right for early and continuous feedback.
- Built readiness to deliver robust, maintainable, and scalable testing solutions in real-world projects.
- Strengthened practical experience with mobile automation and performance testing tools.


Thank
You
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