**Technical Documentation: Cucumber + BDD + TestNG + RestAssured + Extent Reports Integration**

**Overview**

This document provides a comprehensive understanding of how Cucumber, BDD, TestNG, RestAssured, and Extent Reports are integrated into the testing framework.   
It is intended to help new team members grasp the concepts and workflows quickly.

**Key Concepts**

**1. Behavior-Driven Development (BDD):**  
 - Focuses on collaboration between developers, testers, and business stakeholders.  
 - Scenarios are written in Gherkin syntax (`Given-When-Then`) to describe the system’s behavior in plain English.  
  
**2. Cucumber:**  
 - Acts as the BDD tool that processes feature files written in Gherkin.  
 - Maps Gherkin steps to Java methods through step definitions.  
  
**3. TestNG:**  
 - A testing framework used to execute tests, manage test suites, and provide annotations for test configurations.  
  
**4. RestAssured:**  
 - A Java library for testing RESTful APIs.  
 - Simplifies HTTP requests and response validation.  
  
**5. Extent Reports:**  
 - A library to generate interactive and detailed test execution reports.

**Project Structure**

src/test/java  
|-- features # Gherkin feature files  
|-- stepDefinitions # Step definition methods  
|-- runners # TestNG runner classes  
|-- utils # Utility classes (e.g., RestAssured setup, Report generation)  
|-- reports # Generated Extent Reports

**Integration Workflow**

1**. Cucumber with TestNG:**  
 - `@CucumberOptions` in the TestNG runner links feature files with step definitions.  
 - TestNG executes Cucumber scenarios as individual tests.  
*Example:*  
@CucumberOptions(  
 features = "src/test/java/features",  
 glue = "stepDefinitions",  
 plugin = {"pretty", "json:target/cucumber.json"}  
)  
public class TestRunner extends AbstractTestNGCucumberTests {}  
  
**2. Step Definitions:**  
 - Maps Gherkin steps to Java code using annotations like `@Given`, `@When`, `@Then`.  
Example:  
@Given("API endpoint is available")  
public void api\_endpoint\_is\_available() {  
 RestAssured.baseURI = "<https://api.example.com>";  
}  
  
**3. RestAssured Integration:**  
 - Used to send API requests and validate responses.  
Example:  
Response response = RestAssured.given()  
 .header("Content-Type", "application/json")  
 .get("/users");  
Assert.assertEquals(response.getStatusCode(), 200);  
  
**4. Extent Reports:**  
 - Captures test execution status and generates detailed HTML reports.  
Example:  
ExtentReports extent = new ExtentReports();  
ExtentTest test = extent.createTest("API Test");  
test.log(Status.PASS, "Test passed successfully");  
extent.flush();  
  
**5. Execution Flow:**  
 - TestNG runner triggers scenarios.  
 - Cucumber processes feature files and invokes mapped step definitions.  
 - RestAssured handles API requests and validations.  
 - Results are logged to Extent Reports.

**Setting Up the Project**

**1. Dependencies (Maven):**  
*<dependencies>  
 <dependency>  
 <groupId>io.cucumber</groupId>  
 <artifactId>cucumber-java</artifactId>  
 <version>7.11.0</version>  
 </dependency>  
 <dependency>  
 <groupId>org.testng</groupId>  
 <artifactId>testng</artifactId>  
 <version>7.7.0</version>  
 </dependency>  
 <dependency>  
 <groupId>io.rest-assured</groupId>  
 <artifactId>rest-assured</artifactId>  
 <version>5.3.0</version>  
 </dependency>  
 <dependency>  
 <groupId>com.aventstack</groupId>  
 <artifactId>extentreports</artifactId>  
 <version>5.0.9</version>  
 </dependency>  
</dependencies>*  
  
**2. Configuration:**  
 - Set base URI and headers in a utility class.  
Example:

public class APIUtils {  
 public static void setup() {  
 RestAssured.baseURI = "<https://api.example.com>";  
 }  
}  
  
  
3**. Running Tests:**  
 - Execute the `TestRunner` class using TestNG or Maven (`mvn test`).

**Example Test Scenario**

\*\*Feature File (Gherkin):\*\*  
```gherkin  
Feature: User Management  
 Scenario: Validate Get Users API  
 Given API endpoint is available  
 When I send a GET request to "/users"  
 Then I should receive status code 200  
```  
  
\*\*Step Definition:\*\*  
```java  
@When("I send a GET request to {string}")  
public void i\_send\_a\_get\_request\_to(String endpoint) {  
 Response response = RestAssured.given().get(endpoint);  
 scenario.log(Status.INFO, "Response: " + response.asString());  
 Assert.assertEquals(response.getStatusCode(), 200);  
}  
```

**References**

- [Cucumber Documentation](https://cucumber.io/docs)  
- [TestNG Documentation](https://testng.org/doc/)  
- [RestAssured Documentation](https://rest-assured.io/)  
- [Extent Reports Documentation](https://extentreports.com/)