**Test Plan for RESTful Booker API**

**Introduction**

The purpose of this test plan is to ensure that the RESTful Booker API functions correctly and meets the specified requirements. This document outlines the test strategy, test objectives, test environment, test scope, test cases, and acceptance criteria.

**Test Strategy**

**Testing Types**

1. **Functional Testing**: Verify that each endpoint works as expected according to the API documentation.
2. **Integration Testing**: Ensure that all components of the API work together correctly.
3. **Security Testing**: Test for vulnerabilities and ensure secure access using authentication tokens.
4. **Performance Testing**: Measure the performance of the API under various loads.
5. **Error Handling Testing**: Verify that the API returns appropriate error messages and status codes.

**Test Environment**

* **Base URL**: https://restful-booker.herokuapp.com
* **Tools**: Postman, JMeter, OWASP ZAP, and custom scripts for automation.

**Test Scope**

The test scope includes the following endpoints:

1. /ping - Health Check
2. /booking - Create Booking
3. /booking/{id} - Get Booking, Update Booking, Delete Booking, Partial Update Booking
4. /auth - Create Token

**Test Objectives**

1. Verify that the API endpoints work as specified.
2. Ensure that the API handles different types of requests and returns appropriate responses.
3. Validate the security mechanisms, including authentication.
4. Test the API's performance and reliability under load.
5. Ensure proper error handling and messaging.

**Test Cases**

**1. Health Check**

**Test Case ID**: TC-001  
**Endpoint**: /ping  
**Method**: GET  
**Description**: Verify that the API is healthy.  
**Expected Result**: Status code 200 OK.  
**Steps**:

1. Send a GET request to /ping.
2. Verify the response status code is 200 OK.

**2. Create Booking**

**Test Case ID**: TC-002  
**Endpoint**: /booking  
**Method**: POST  
**Description**: Verify that a new booking can be created.  
**Expected Result**: Status code 200 OK and a valid booking object in the response.  
**Steps**:

1. Send a POST request to /booking with a valid JSON body.
2. Verify the response status code is 200 OK.
3. Verify the response body contains the booking details.

**3. Get Booking**

**Test Case ID**: TC-003  
**Endpoint**: /booking/{id}  
**Method**: GET  
**Description**: Verify that a booking can be retrieved by ID.  
**Expected Result**: Status code 200 OK and the correct booking details in the response.  
**Steps**:

1. Create a new booking and note the booking ID.
2. Send a GET request to /booking/{id} using the noted ID.
3. Verify the response status code is 200 OK.
4. Verify the response body contains the correct booking details.

**4. Update Booking**

**Test Case ID**: TC-004  
**Endpoint**: /booking/{id}  
**Method**: PUT  
**Description**: Verify that a booking can be updated by ID.  
**Expected Result**: Status code 200 OK and the updated booking details in the response.  
**Steps**:

1. Create a new booking and note the booking ID.
2. Send a PUT request to /booking/{id} with a valid JSON body to update the booking.
3. Verify the response status code is 200 OK.
4. Verify the response body contains the updated booking details.

**5. Delete Booking**

**Test Case ID**: TC-005  
**Endpoint**: /booking/{id}  
**Method**: DELETE  
**Description**: Verify that a booking can be deleted by ID.  
**Expected Result**: Status code 201 Created.  
**Steps**:

1. Create a new booking and note the booking ID.
2. Send a DELETE request to /booking/{id}.
3. Verify the response status code is 201 Created.

**6. Partial Update Booking**

**Test Case ID**: TC-006  
**Endpoint**: /booking/{id}  
**Method**: PATCH  
**Description**: Verify that a booking can be partially updated by ID.  
**Expected Result**: Status code 200 OK and the partially updated booking details in the response.  
**Steps**:

1. Create a new booking and note the booking ID.
2. Send a PATCH request to /booking/{id} with a valid JSON body to partially update the booking.
3. Verify the response status code is 200 OK.
4. Verify the response body contains the partially updated booking details.

**7. Create Token**

**Test Case ID**: TC-007  
**Endpoint**: /auth  
**Method**: POST  
**Description**: Verify that an authentication token can be created.  
**Expected Result**: Status code 200 OK and a valid token in the response.  
**Steps**:

1. Send a POST request to /auth with valid credentials.
2. Verify the response status code is 200 OK.
3. Verify the response body contains a valid token.

**Acceptance Criteria**

1. All test cases must pass with the expected results.
2. The API must handle all valid and invalid requests gracefully.
3. Security mechanisms must be validated and secure.
4. Performance testing should show that the API can handle a reasonable load.
5. Proper error messages and status codes must be returned for invalid requests.

**Roles and Responsibilities**

* **Test Lead**: Responsible for planning and overseeing the testing process.
* **QA Engineers**: Responsible for writing and executing test cases.
* **Developers**: Responsible for fixing any defects found during testing.

**Schedule**

* **Test Planning**: 2 days
* **Test Case Development**: 3 days
* **Test Execution**: 5 days
* **Bug Fixing and Re-testing**: 3 days
* **Final Review and Sign-off**: 1 day