# Squad Master - Quality Assurance (QA) Plan

## 1. Quality Assurance Strategy

### Overview

Quality assurance (QA) is a critical aspect of the software development process, ensuring that Squad Master meets both functional and non-functional requirements. This plan outlines the methodologies, metrics, and testing strategies that will be used to verify the system's reliability and performance. The QA strategy includes testing and validation processes aimed at maintaining software quality and ensuring that the system functions as expected across various use cases.

### Testing Methodologies

•        **Unit Testing:** Evaluates individual components like filtering functions and squad selection algorithms.

•        **Integration Testing:** Ensures API integration fetches and processes data correctly.

•        **Usability Testing:** Assesses user experience and ease of interaction with the UI.

### Automated vs. Manual Testing

| Test Type | Automated | Manual |
|---|:---:|:---:|
| Unit Tests | ✔ | ✖ |
| Integration Tests | ✔ | ✖ |
| UI Usability | ✖ | ✔ |
| Performance Tests | ✔ | ✖ |

## 2. Quality Factors & Metrics

### Key Quality Factors

To maintain high software quality, the following factors are considered:

| Factor | Description | Measurement Metric |
|---|---|---|
| **Performance** | System response time | Average response time (ms) |
| **Security** | Protection against unauthorized access | Number of security vulnerabilities detected |
| **Usability** | Ease of user interaction | User satisfaction score from surveys |
| **Maintainability** | Ease of modifying and extending the codebase | Code complexity score (Cyclomatic Complexity) |

## 3. Test Plan

**Test Cases**

The following test cases ensure that core functionalities are working correctly:

| Test ID | Test Description | Expected Result |
|---------|------------------|-----------------|
| **TC-01** | Fetch player data from API | Data retrieved successfully |
| **TC-02** | Filter players by position and rating | Players displayed correctly |
| **TC-03** | Select and save a squad | Squad saved successfully |
| **TC-04** | Drag and drop player in UI | Player repositioned correctly |
| **TC-05** | Generate alternative squads with different parameters | New optimized squad created |

**Bug Tracking**

- All identified bugs will be logged in GitHub Issues.
- Each issue will include:
    - ✓ Bug description
    - ✓ Steps to reproduce
    - ✓ Expected vs actual result
    - ✓ Assigned developer
    - ✓ Fix status