

**Department of Information Technology**

**SOFTWARE ENGINEERING**

Title: Agile Planning Document

Project Name: Advanced Calculator System

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Contents

[User Story Mapping 3](#_Toc193624722)

[Product Backlog 4](#_Toc193624723)

[Sprint Planning (2 Weeks) 5](#_Toc193624724)

[Sprint backlog Table 5](#_Toc193624725)

[Milestones 6](#_Toc193624726)

[Traceability 7](#_Toc193624727)

[Done 8](#_Toc193624728)

[Risks and Mitigation Strategies 8](#_Toc193624729)

[Conclusion 8](#_Toc193624730)

# Introduction

This document outlines the Agile development plan for advanced calculator system. The plan includes backlog prioritization, sprint planning, traceability and risk mitigation strategies to ensure an efficient, iterative development cycle.

# User Story Mapping

This table includes a table for each of the user stories as they relate to the product backlog, with their acceptance criteria.

|  |  |  |  |
| --- | --- | --- | --- |
| **ID Story** | **User Story Description** | **Acceptance Criteria** | **Priority** |
| US-001 | As a user I want to perform basic calculations so that I can quickly get results. | The system correctly computes addition, subtraction, multiplication, and division. | High |
| US-002 | As a student, I want to save my calculation history so that I can refer to past results | Users can view, delete, and export calculation history. | High |
| US-003 | As a user, I want to clear my calculation history so I can remove old data. | The system provides an option to clear history with confirmation prompt. | Medium |
| US-004 | As a user, I want to graph mathematical functions so that I can visualize calculations. | Users can input a function and generate an accurate graph. | High |
| US-005 | As a user, I want to perform unit conversions so that I can quickly switch between different measurement systems | The system allows unit conversions for length, weight, and temperature | Medium |
| US-006 | As an advanced user, I want access to logarithmic and trigonometric functions so that I can solve complex equations. | They system supports advanced functions like logarithms, sine, cosine, and tangent | High |
| US-007 | As a user, I want to save frequently used calculations so that I can access them easily. | The system allows users to store and retrieve saved calculations. | Medium |
| US-008 | As a user, I want to export my calculation history so that I can use it in external reports. | System provides export options in CSV and PDF formats. | Medium |
| US-009 | As an admin, I want user data to be encrypted so that security compliance is met. | All sensitive data is encrypted using AES-256 | High |
| US-010 | As a user, I want the calculator to load quickly so that I can start using it without delays. | System loads within 2 seconds of access. | High |

# Product Backlog

This backlog table includes MoSCoW prioritization, effort estimates and dependencies.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Story ID | User Story | Priority (MoSCoW) | Effort Estimate (Story Points) | Dependencies |
| US-001 | Develop | Must-Have | 3 | None |
| US-002 | Save calculation history | Must-Have | 5 | US-001 |
| US-003 | Clear calculation history | Must-Have | 2 | US-002 |
| US-004 | Graph Functions | Must-Have | 5 | US-001 |
| US-005 | Unit Conversions | Should-have | 3 | None |
| US-006 | Advanced Math Function | Must-Have | 4 | US-001 |
| US-007 | Save Frequent calculations | Should-have | 2 | US-002 |
| US-008 | Export History | Should-have | 5 | US-002 |
| US-009 | Encrypt user data security | Must-Have | 2 | US-002 |
| US-010 | Optimize calculator load time. | Must-Have | 3 | None |

# Sprint Planning (2 Weeks)

Sprint planning include sprint goal and a sprint backlog table. The sprint backlog table lists asks broken down from user stories, and assigned team members. Each task has estimated hours and status.

**Sprint task table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task ID | Tsk Description | Assigned To | Estimated Hours | Status |
| T-001 | Develop search API endpoint | Dev Team | 8 | To do |
| T-002 | Design UI for results page | UI Team | 6 | To do |
| T-003 | Implement checkout logic | Dev Team | 12 | To do |
| T-004 | Test search functionality. | QA Team | 6 | To do |

**Sprint goals:**

* Implement basic arithmetic operations and advanced mathematical functions.
* Enable history storage and management.
* Introduce graphing functionality and unit conversions.

This sprint goals aim to build the core functionality of the advanced calculator system, ensuring users can perform basic and advanced calculations, store history, and visualise functions through graphing. By the end of the sprint, the system will support secure, fast, and efficient mathematical operations, forming the foundation for additional enhancements.

# Sprint backlog Table

|  |  |  |
| --- | --- | --- |
| **Task** | **User Story** | **Priority** |
| Develop core calculator functions (addition, subtraction, multiplication, division) | US-001 | High |
| Implement history storage, retrieval and deletion. | US-002, US-003 | High |
| Implement function graphing. | US-004 | High |
| Implement unit conversion features. | US-005 | Medium |
| Introduce export functionality for calculation history. | US-008 | Medium |
| Ensure security measures, including encryption for user data. | US-009 | High |
| Optimize performance for fast loading times. | US-010 | High |
| Implement logarithmic and trigonometric functions. | US-006 | High |
| Develop feature for saving frequently used calculations. | US-007 | Medium |

# Milestones

Provides a timeline with the projects milestones, start and end dates for each task in the sprint.

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Duration** | **Features to complete** |
| Sprint 1: Core calculator functions | March 25-April 7 | Basic calculations, advanced functions, performance optimization. |
| Sprint 2: Calculation history and export | April 8 – April 21 | History storage, management, export features. |
| Sprint 3: Graphing and unit conversion | April 22 – May 5 | Graphing functionality, unit conversions. |
| Sprint 4:Security and performance | May 6 – May 19 | Security enhancements, encryption, final performance tuning. |

# Traceability

The traceability table ensures that all the user stories align with the functional and non-functional requirements, providing a clear mapping between system features.

|  |  |  |  |
| --- | --- | --- | --- |
| **User ID** | **Requirement ID** | **Description** | **Traceability** |
| US-001 | FR-01 | Perform basic arithmetic operations (addition, subtraction, multiplication, division) | Directly fulfils this functional requirement. |
| US-002 | FR-03 | Allows users to store and retrieve previous calculations | Aligns with the requirement of storing and retrieving calculation history. |
| US-003 | FR-04 | Provide an option to clear stored calculations. | Supports the ability to manage stored calculations. |
| US-004 | FR-05 | Provide a graphing feature for functions. | Direct mapping to the graphing functionality requirement. |
| US-005 | FR-06 | Implement unit conversion for length, weight, and temperature. | Ensures support for multiple unit conversions. |
| US-006 | FR-07 | Implement logarithmic and trigonometric functions. | Directly fulfils the requirement for advanced mathematical operations. |
| US-007 | FR-03 | Allow users to save frequently used calculations. | Supports the functionality of storing previous calculations. |
| US-008 | FR-08 | Export calculation history in CSV and PDF formats. | Aligns with the requirement to allow exporting user data. |
| US-009 | NFR-02 | Ensure encryption for user data for compliance and security. | Maps to the requirement ensuring data security and encryption. |
| US-010 | NFR-01 | Optimize system performance for fast loading. | Directly fulfils the requirement for high performance and responsiveness. |

# Done

A user story is considered complete when:

* The code is developed, reviewed, and merged into the main branch.
* Functionality is tested (unit tests, integration tests and IU tests)
* Documentation is updated where applicable.
* The feature is deployed and verified in a staging environment.

# Risks and Mitigation Strategies

|  |  |  |
| --- | --- | --- |
| **Risk** | **Impact** | **Mitigation Strategy** |
| Feature delays | High | Prioritize MVP features and adjust scope as needed. |
| Security vulnerabilities | High | Implement security best practices and conduct regular audits. |
| Performance issues | Medium | Optimize code, use caching, and conduct load testing. |
| Scope creep | Medium | Clearly define sprint goals and implement a structured control process to evaluate and approve additional feature requests before integration. |

# Conclusion

The advanced calculator system is structured using Agile principles, ensuring iterative progress toward a functional MVP. The backlog, sprint plan, milestones, and collaboration tools provide transparency and traceability, ensuring efficient development and delivery.