Arithmetic Expression Evaluator

Software Development Plan

Version <1.0>

*[Note: The following template is provided for use with the Unified Process for EDUcation. Text enclosed in square brackets and displayed in blue italics (style=InfoBlue) is included to provide guidance to the author and should be deleted before publishing the document. A paragraph entered following this style will automatically be set to normal (style=Body Text).]*

*[To customize automatic fields in Microsoft Word (which display a gray background when selected), select File>Properties and replace the Title, Subject and Company fields with the appropriate information for this document. After closing the dialog, automatic fields may be updated throughout the document by selecting Edit>Select All (or Ctrl-A) and pressing F9, or simply click on the field and press F9. This must be done separately for Headers and Footers. Alt-F9 will toggle between displaying the field names and the field contents. See Word help for more information on working with fields.] Marked (shaded) areas: items that are OK to leave out.*

Revision History

| **Date** | **Version** | **Description** | **Author** |
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| <dd/mmm/yy> | <x.x> | <details> | <name> |
| 18/09/2024 | 1.0 | Initial editing of the document to fill out all required sections and created meeting log. | Team |
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Software Development Plan

# 

# Introduction

*[The introduction of the* ***Software Development Plan*** *provides an overview of the entire document. It includes the purpose, scope, definitions, acronyms, abbreviations, references, and overview of this* ***Software Development Plan****.]*

## Purpose

*[Specify the purpose of this* ***Software Development Plan****. The text below is provided as an example****.*** *]*

The purpose of the *Software Development Plan* is to detail all information related to the project. This includes what the aim of the project is and the approach to the development of the software. This document is the top-level plan generated by all the team members to explain the steps of the development effort.

The following people use the *Software Development Plan*:

* The **project manager** uses it to plan the project schedule and resource needs, and to ensure the team is making progress at the right pace.
* **Project team members** use it to understand their objectives and deadlines, as well as the overview of the project.

## Scope

*[A brief description of the scope of this* ***Software Development Plan****; what Project(s) it is associated with and anything else that is affected or influenced by this document. The text below is provided as an example.]*

This *Software Development Plan* describes the overall plan to be used by the Arithmetic Expression Evaluator project, including deployment of the product. It also describes the different roles of team members. The details of the individual iterations will be described in the Iteration Plans.  
The plans as outlined in this document are based upon the product requirements as defined in the *Vision Document*.

## Definitions, Acronyms, and Abbreviations

*[This subsection provides the definitions of all terms, acronyms, and abbreviations required to properly interpret the* ***Software Development Plan****. This information may be provided by reference to the project’s Glossary.]*

*+* (addition)

- (subtraction)

\* (multiplication)

/ (division)

% (modulo)

\*\* (exponentiation)

## References

*[This subsection provides a complete list of all documents referenced elsewhere in the* ***Software Development Plan****. Identify each document by title, report number if applicable, date, and publishing organization. Specify the sources from which the references can be obtained. This information may be provided by reference to an appendix or to another document.*

*For the* ***Software Development Plan****, the list of referenced artifacts includes:*

* *Iteration Plans*
* *Development Case*
* *Vision [you may prepare a vision statement of your own: what your vision for the project is]*
* *Glossary*
* *Meeting Log*
* *Any other supporting plans or documentation.*
* [*GitHub*](https://github.com/MinoMax0205/EECS-348-Project---Group-1) *reposi*
* [*Meeting Log*](https://docs.google.com/document/d/1jiPPu5WAUli79O-ZVyhve-rKLh3cqSeR7KOyC5I2abE/edit)

## Overview

*[This subsection describes what the rest of the* ***Software Development Plan*** *contains and explains how the document is organized. The text below is provided as an example.]*

This *Software Development Plan* contains the following information:

Project Overview  — provides a description of the project's purpose, scope, and objectives.  It also defines the deliverables that the project is expected to deliver.

Project Organization  — describes the organizational structure of the project team.

Management Process  — explains the estimated cost and schedule, defines the major phases and milestones for the project, and describes how the project will be monitored.

Applicable Plans and Guidelines — provide an overview of the software development process, including methods, tools and techniques to be followed.

# Project Overview

## Project Purpose, Scope, and Objectives

*[A brief description of the purpose and objectives of this project and a brief description of what deliverables the project is expected to deliver.]*

The object of this project is to build an arithmetic expression evaluator in C++. The program is meant to parse and calculate arithmetic expressions with operators and numeric constants. The program will take input from the user, parse it, and calculate a result according to the order of operations. The purpose of this project is to understand the development lifecycle, expose team members to integrating someone else’s work, and reinforce our understanding of parsing techniques and algorithm design.

## Assumptions and Constraints

*[A list of assumptions that this plan is based on and any constraints, for example. staff, equipment, schedule, that apply to the project.]*

The ability to do/learn C++

Schedule/meeting times being in the morning or night for attendance of all members

Project has to be coded in C++

Balancing our schedule for the project and other personal tasks

## Project Deliverables

*[A list of the artifacts to be created during the project, including target delivery dates. The text below is provided as an example.] Requirements, design specs, test cases, code*

Project Plan due 9/29

Project Requirements due 10/13

Project Architecture and Design due 11/10

Project Implementation due 12/12

Project Test Cases due 12/12

Project User Manual due 12/12

Deliverables for each project phase are identified in the Development Case. Deliverables are delivered towards the end of the iteration, as specified in section *4.2.4 Project Schedule*.

## Evolution of the Software Development Plan

*[A table of proposed versions of the* ***Software Development Plan****, and the criteria for the unscheduled revision and reissue of this plan. The text below is provided as an example.]*

The *Software Development Plan* will be revised prior to the start of each Iteration phase.

# Project Organization

## Organizational Structure

*[Describe the organizational structure of the project team, including management and other review authorities.]*

Megan Svoren is Technical Leader due to her in-depth knowledge of many program languages.

Maxwell Phachanla is the Assistant Team Administrator to make sure that meeting logs are recorded and kept.

Bryce Martin - Quality Assurance: Will make sure all documents and code is up to quality standard.

Luke Kounkel - Assistant Technical Manager: Will learn C++ and assist Technical leader in writing the project code.

Jacob Richards- Team administrator, make sure everything is filled out in the documents,meeting logs are tracked, scheduling, deadlines are met, turn ins are done.

## External Interfaces

*[Describe how the project interfaces with external groups. For each external group, identify the internal and external contact names. This should include responsibilities related to deployment and acceptance of the product.]*

The project will be graded either by the course’s professor, Hossein Saiedian, or one of the TAs. They will judge the quality of our teamwork and the project itself.

## Roles and Responsibilities *[the more details here, the easier your job; include contact info, availability info, expertise, …]*

*[Identify the project organizational units that will be responsible for each of the disciplines, workflow details, and supporting processes. The text below is provided as an example.]*

| **Person** | **Unified Process for EDUcation Role** |
| --- | --- |
| Maxwell Phachanla | Assistant Team Administrator / [m281p216@ku.edu](mailto:m281p216@ku.edu) / 7853424406  Availability: M 9:30 - 10:50 AM & 3:00 PM -, TT 9:30 - 12:30 AM, W 9:30 - 10:50 AM & 3:00 PM -, TH 9:30 - 10:50 AM & 5:30 PM -, F NA |
| Bryce Martin | Quality Assurance Engineer / 913-832-0292 / [brycemartin@ku.edu](mailto:brycemartin@ku.edu), |
| Luke Kounkel | Assistant Technical Manager/ [lukekounkel@gmail.com](mailto:lukekounkel@gmail.com)/ 9133374155  Availability: M 10am-12am, TT 10:30am-1pm, WF -12am |
| Noah Hamlet | Project Leader, 785-304-5867, [noahhamlet08@gmail.com](mailto:noahhamlet08@gmail.com), availability: M-F 9-11 a.m. |
| Megan Svoren | Technical Leader / 913-280-4760 / [megan.svoren@ku.edu](mailto:megan.svoren@ku.edu)  Availability: MWF 9-11am |
| Jacob Richards | Team Administrator 913-534-1139, [j140r614@ku.edu](mailto:j140r614@ku.edu), availability M-F 9-11am , weekends as needed |

Anyone on the project can perform [Any Role](about:blank) activities.

# Management Process

## Project Estimates

*[Provide the estimated cost and schedule for the project, as well as the basis for those estimates, and the points and circumstances in the project when re-estimation will occur.]*

No estimated cost except for time and sleep.

## Project Plan

*[This section contains the schedule and resources for the project.]Project artifact as well as iteration schedules]*

Complete Project Plan by 9/29

Complete Project Requirements by 10/13

Complete Project Architecture and Design by 11/10

Complete Project Implementation by 12/12

Complete Project Test Cases by 12/12

Complete Project User Manual by 12/12

### Phase Plan

*[Include the following:*

∙ *a Gantt chart showing the allocation of time to the project phases (Not necessarily detailed to the activity level; this type of Gantt Chart is providing along with the Iteration Plans themselves; Provide an Overview of the project Timeline with the major miles stones]*

∙ *identify* ***major milestones*** *with their achievement criteria*

*Define any important release points and demos.]*

*[If available, refer to the related* ***Iteration Plan Documents*** *for more details]*

### Iteration Objectives

*[Briefly list the objectives to be accomplished for each of the iterations and Refer to the related* ***Iteration Plan Documents*** *for more details.]*

Project Plan

Project Requirements

Project Architecture and Design

Project Implementation

Project Test Cases

Project User Manual

### Releases

*[A brief description of each software release and whether it’s demo, beta, and so on.]*

Arithmetic expression evaluator beta

### Project Schedule

*[Diagrams or tables showing target dates for completion of iterations and phases, release points, demos, and other milestones.] [Limit to major project milestone, e.g., requirements, design, implementation, and testing]*

Project Plan due 9/29

Project Requirements due 10/13

Project Architecture and Design due 11/10

Project Implementation due 12/12

Project Test Cases due 12/12

Project User Manual due 12/12

### Project Resourcing

*[Identify the numbers and type of staff required here, including any special skills or experience, scheduled by project phase or iteration.*

*List any special training project team members will require, with target dates for when this training should be completed.]*

## Project Monitoring and Control

*[The following is a checklist of items to consider:*

* *Requirements Management: Specify the information and control mechanisms which will be collected and used for measuring, reporting, and controlling changes to the product requirements.*

VisualStudios will be providing most of the control mechanisms through error detections and coded constraints/parameters. The Quality Assurance Manager and the other members will regularly check the project to make sure that it is on schedule to be completed.

* *Quality Control: Describe the timing and methods to be used to control the quality of the project deliverables and how to take corrective action when required. Include techniques, metrics, criteria, and procedures used for evaluation— this will include walkthroughs, inspections, and reviews. Note that this is in addition to the Test Plan, which is not enclosed in the Software Development Plan.*

The team will ensure quality control by meticulously reviewing each other’s work. We will utilize Visual Studio, an effective source code editor equipped with robust error detection and debugging capabilities, to maintain accuracy. Regular testing of the code will be performed to ensure consistency and reliability.

For managing version control, we will use GitHub, which allows us to effortlessly track code modifications and support collaborative development. Additionally, we will maintain detailed documentation, covering project plans, meeting notes, ideas, and changes, to ensure clarity and coherence throughout the project’s duration.

* *Reporting and Measurement: Describe reports to be generated. Specify which metrics should be collected and why.* ***OR*** *if available, refer to the* ***Project Measurements and Project Measurements*** *document*
* *Risk Management: Describe the approach that will be used to identify, analyze, prioritize, monitor and mitigate risks. If available, refer to the* ***Risk List*** *document.*

To minimize risk, we will implement a multi-step testing process alongside comprehensive code commenting. This approach ensures that potential issues are identified early and that the code is well understood by all team members

* *Configuration Management: Describe the process by which problems and changes are submitted, reviewed, and dispositioned. Describe how project or product artifacts are to be named, marked, and numbered, including system software, plans, models, components, test software, results and data, executables, and so on. Describe retention policies, and the back-up, disaster, and recovery plans.* ***OR*** *if Available, Refer to the* ***Configuration Management Plan*** *document*

*The text that follows is provided as an example.]*

## **Requirements Management**

The requirements for this system are captured in the Vision document. Requested changes to requirements are captured in Change Requests, and are approved as part of the Configuration Management process.

## **Quality Control**

Defects will be recorded and tracked as Change Requests, and defect metrics will be gathered (see Reporting and Measurement below).

All deliverables are required to go through the appropriate review process, as described in the Development Case. The review is required to ensure that each deliverable is of acceptable quality, using guidelines and checklists.

Any defects found during review which are not corrected prior to releasing for integration must be captured as Change Requests so that they are not forgotten.

## **Reporting and Measurement**

Updated schedule estimates, and metrics summary reports, will be generated at the end of each iteration.

The Minimal Set of Metrics, as described in the RUP Guidelines: Metrics will be gathered on a weekly basis. These include:

Earned value for completed tasks. This is used to re-estimate the schedule and budget for the remainder of the project, and/or to identify need for scope changes.

Total defects open and closed – shown as a trend graph. This is used to help estimate the effort remaining to correct defects.

Acceptance test cases passing – shown as a trend graph. This is used to demonstrate progress to stakeholders.

*Refer to the Project Measurements Document (AAA-BBB-X.Y.doc) for detailed information.*

## **Risk Management**

Risks will be identified in the Inception Phase using the steps identified in the RUP for Small Projects activity “Identify and Assess Risks”. Project risk is evaluated at least once per iteration and documented in this table.

*Refer to the Risk List Document (CCC-DDD-X.Y.doc) for detailed information.*

## **Configuration Management**

Appropriate tools will be selected which provide a database of Change Requests and a controlled versioned repository of project artifacts.

All source code, test scripts, and data files are included in baselines. Documentation related to the source code is also included in the baseline, such as design documentation. All customer deliverable artifacts are included in the final baseline of the iteration, including executables.

The Change Requests are reviewed and approved by one member of the project, the Change Control Manager role.

*Refer to the Configuration Management Plan (EEE-FFF-X.Y.doc) for detailed information.*

# 

# Annexes

*[Additional material of use to the reader of the* ***Software Development Plan****. Reference or include any project technical standards and plans which apply to this project. This typically includes the Programming Guidelines, Design Guidelines, and other process guidelines. The text that follows is provided as an example.]*

The project will follow the UPEDU process.

Other applicable process plans are listed in the references section, including Programming Guidelines.