Software Requirements Specification Template

Acknowledgements:
Sections of this document are based upon the IEEE Guide to Software Requirements Specification (ANSI/IEEE Std. 830-1984).

Static_Code_Checker

Software Requirements Specification

V1.0.0

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Revision History

Date	Description	Author	Comments
Feb 11 2020	V1.0.0	All	Created the initial document

Document Approval

The following Software Requirements Specification has been accepted and approved by the following:

Signature	Printed Name	Title	Date

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1. Introduction

1.1 Purpose

This SRS document is for the Static Code Checker software. This software is designed primarily for students, teachers, interviewers, and interviewees. The SRS document contains all information for software designers and developers to adequately create the Static Code Checker product.

1.2 Scope

This product runs a localized server using the Python package, Flask. Flask hosts a web server with the ECMAscript(JavaScript) files: BootStrap and JQuery, which is heavily used in our front end design. This product will be able to compile Java source code (.java files) and compare their outputs against that of a master file. We wish to take this time to stress that this is a localized project please do not put it on a server as it opens you up to potential security flaws. This can be used to speed up the general grading process or for an interview to constantly check code. This application works much like LeetCode or HackerRank to compare and contrast code, but is run locally which can a) speed up runtime and b) keep code private.

1.3 Definitions, Acronyms, and Abbreviations

1.4 Overview

This document will continue to list out the functionality of this application along with explaining use cases and explain the decency choices that we have made. For more information on how this document is formatted please see the above table.

2. General Description

A system built to help in the process of grading either for teachers or in an interviewing process.

- Teacher Grading
    - Allows teachers to instantly grade a class
- Student
    - Allows students to test their code against inputs / outputs given by a teacher
- Interviewer Grading
    - Allows interviewers to inspect and grade code
- Interviewee
    - Allows interviewers to test their code against inputs / outputs given by a teacher

2.1 Product Perspective

This product stands on its own independent from any existing product. It implements functionality present in the Java Runtime Environment to compile code but that's all.

2.2 Product Functions

This product can:

- Compile Code and Compare the Outputs
    - Teachers and Interviewers can Compile a list of src files and compare their outputs against a master output to return grading information
    - Students can compile their local code and compare it next to a master output from a professor, this will also support multi test cases

- Grade
    - As mentioned above the user can grade a large selection of source files, this allows teachers to skip over source code that is completely fine and give students who require more time just that

2.3 Users and Characteristics

- Student
    - Allows students to run test given inputs against expected outputs.
- Teachers
    - Allows teachers to grade an entire classes homework at the same time
- Interviewer
    - Allows interviewees to test their code while obscuring the ability to see expected output and input

- Interviewer
    - Allows the interview to grade the interviewees while being able to test and change inputs

2.4 General Constraints

Support for certain programming languages will be limited as some languages only like to work effectively on certain operating systems. Time will also play into limiting the potential of this software as this is like an 8 week project.

2.5 Assumptions and Dependencies

- There will be an OS present
- Users will be able to properly setup input and output files
- Users will be able to edit and manipulate code in a "linting"- free environment

2.6 Operating Environment

The best part of this project is that it uses python to run, this gives the ability to cross compile. This means that if the computer is running Python 3.2 or higher the application will also run. We recommend that you use Python 3.7.X as it is currently (2/5/20) stable.

3. Specific Requirements

3.1 External Interface Requirements

3.1.1 User Interfaces

3.1.2 Hardware Interfaces

3.1.3 Software Interfaces

3.1.4 Communications Interfaces

3.2 Functional Requirements

This section describes specific features of the software project. If desired, some requirements may be specified in the use-case format and listed in the Use Cases Section.

3.2.1 REQ-1: Upload input file

3.2.1.1 Description and Priority

This is a feature for users to use where they can upload a text file containing a series of inputs that will be used to check to see if the code is correct. This requirement is of high priority as it is key to the basic functionality of this software. Rating 9.

3.2.1.2 Stimulus/Response Sequences

The user shall be able to click an upload input file button, navigate through their file explorer to locate the file and then upload the file to the software.

3.2.1.3 Functional Requirements

Requirement of uploading a .txt file.

<Each requirement should be uniquely identified with a sequence number or a meaningful tag of some kind.>

3.2.1.3.1 REQ-1: For the input file, the user needs to be able to navigate their systems file explorer to locate the file.

…….

3.2.2 REQ-2: Upload Output File

3.2.2.1 Description and Priority

This feature will be available for users to allow the upload of an output file that will be used alongside the dedicated input file. The output file will just be a formatted text file which will be used to check the output of the users compiled code. This feature is of high priority, rated at a 9.

3.2.2.2 Stimulus/Response Sequences

The user shall be able to click an upload output file button, navigate through their file explorer to locate the file and then upload the file to the software.

3.2.1.3 Functional Requirements

Requirement of uploading a .txt file.

3.2.2.3.1 REQ-1: For the output file, the user needs to be able to navigate their systems file explorer to locate the file.

3.2.3 REQ-3 - Teacher View

3.2.3.1 Description and Priority

This feature will be utilized by the teacher to view student output. Also the students code will be linked creating the option to click their code and have it open with the teachers default code editor by the file extension.

3.2.3.2 Stimulus/Response Sequences

The user shall click on a button that will direct them to the teacher view part of the application.

3.2.3.3 Functional Requirements

Laptop to access the application and then clicking the “Teacher View” button.

3.2.1.3.3 REQ-1: User must have the application open to teacher view.

3.2.4 REQ-4 - Student View

3.2.4.1 Description and Priority

This feature will be used to allow students to view their own code as well as their teacher’s code as the example output. The feature will allow students to view any errors they have and compare to the example output.

3.2.4.2 Stimulus/Response Sequences

The user shall click on a button that will direct them to the student view part of the application.

3.2.4.3 Functional Requirements

Laptop to access the application and then clicking the “Student View” button.

3.2.1.3.4 REQ-1: User must have the application open and left click student.

3.2.5 REQ-5 - Interviewer View

3.2.5.1 Description and Priority

This feature will allow Interviewer's to look at an interviewee's code and to compare that code to the example output provided by the interviewer.

3.2.5.2 Stimulus/Response Sequences

The user shall click on a button that will direct them to the student view part of the application.

3.2.5.3 Functional Requirements

Laptop to access the application and then clicking the "Interviewer View" button.

3.2.1.3.5 REQ-1: User must have the application open and left click the student.

3.2.6 REQ-6 - Interviewee View

3.2.6.1 Description and Priority

This feature will be utilized by the teacher to view student output. Also the students code will be linked creating the option to click their code and have it open with the teachers default code editor by the file extension.

3.2.6.2 Stimulus/Response Sequences

The user shall click on a button that will direct them to the interviewee view part of the application.

3.2.6.3 Functional Requirements

Laptop to access the application and then clicking the "IntervieweeView" button.

3.2.1.3.6 REQ-1: User must have the application open and left click the interviewee.

3.2.7 REQ-7 - Exporting CSV/PDF Files

3.2.7.1 Description and Priority

This feature will allow the teacher or interviewer to export a file containing the score of each submission. This

is of high importance because it will allow the teacher to save time by seeing which students have perfect

output or have messed up. Priority level is an 8.

3.2.7.2 Stimulus/Response Sequences

The user shall be able to click an export file button, navigate through their file explorer to select where the file should be saved.

3.2.7.3 Functional Requirements

Having run submissions to create a file.

3.2.1.3.7 REQ-1: For the Exporting CSV/PDF files, the user needs to be able to navigate their systems file explorer to locate where the file to be saved.

3.2.8 REQ-8 - Highlight Differences in Output

3.2.8.1 Description and Priority

This feature will be available for all users being accessed once the user submits their code. Its purpose is to let the user see the differences within the submission and given example output.

3.2.8.2 Stimulus/Response Sequences

The user shall submit their work and see a highlighted difference in the output if they are wrong.

3.2.8.3 Functional Requirements

Submit a working file, we will work out an output if the code does not compile.

3.2.1.3.8 REQ-1: The user must run the code through the application. There must be no differences in the code to have no highlighted text.

3.2.9 REQ-9 - Run Student/Interviewee view code

3.2.9.1 Description and Priority

This is a feature available for all users and can be accessed from each view. A user will be able to upload some code files which they can compile. Priority is high with a rating of 9.

3.2.9.2 Stimulus/Response Sequences

The user shall be able to click the upload button and be able to provide a code file through navigating their file explorer.

3.2.9.3 Functional Requirements

Allow for uploading of python, ruby, java, and Go files.

3.2.1.3.9 REQ-1: User must upload a file and left click the run code button

3.2.10 REQ-10 - Comparing code to given output within output file

3.2.10.1 Description and Priority

This is a feature available to all users that will compare the output generated from their code files and input files to the information within the output file provided. Priority is high with a rating of 9.

3.2.10.2 Stimulus/Response Sequences

The user shall be able to view a results screen/document that will tell them their score that they have received from testing their code.

3.2.10.3 Functional Requirements

Allow for output window or file (xlsx(like)/pdf)

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3.3 Use Cases

3.3.1 Use Case #1

Use Case Name	Upload Input File
Reference	Section 3.2.1
Trigger	The reader presses the upload input file button

Precondition	The user has already selected their designated view
Basic Path	1.The user can select the upload input file button. 2.The user will then be prompted with the file explorer where they can navigate their computer to find the proper input file. 3.The user can then select their designated file and it will be uploaded into the software.
Alternative Paths	None
Postcondition	The selected file is uploaded to the software and it visually shows the user that the upload was successful.
Exception Paths	The user may exit the filer explorer and abandon the file upload.
Other	None

USE CASE 1

3.3.2 Use Case #2

Use Case Name	Upload Output File
Reference	Section 3.2.2
Trigger	The reader presses the upload outputfile button
Precondition	The user has already selected their designated view
Basic Path	1. The user can select the upload output file button. 2. The user will then be prompted with the file explorer where they can navigate their computer to find the proper output file. 3. The user can then select their designated file and it will be uploaded into the software.
Alternative Paths	None
Postcondition	The selected file is uploaded to the software and it visually shows the user that the upload was successful.
Exception Paths	The user may exit the filer explorer and abandon the file upload.
Other	None

USE CASE 2

3.3.3 Use Case #3

Use Case Name	Teacher View
Reference	Section 3.2.3
Trigger	The user selects the Teacher button
Precondition	The user has already launched the software and is on the opening screen.
Basic Path	1. The user will be on the homepage of the software 2. The user will need to left click the teacher button to select the teacher view
Alternative Paths	None
Postcondition	The user is navigated to the teacher view page and the page successfully loads
Exception Paths	None
Other	None

USE CASE 3

3.3.4 Use Case #4

Use Case Name	Student View
Reference	Section 3.2.4
Trigger	The user selects the Student button
Precondition	The user has already launched the software and is on the opening screen.
Basic Path	1. The user will be on the homepage of the software 2. The user will need to left click the teacher button to select the student view
Alternative Paths	None
Postcondition	The user is navigated to the student view page and the page successfully loads
Exception Paths	None
Other	None

USE CASE 4

3.3.5 Use Case #5

Use Case Name	Interviewer View
Reference	Section 3.2.5
Trigger	The user selects the interviewer button
Precondition	The user has already launched the software and is on the opening screen.
Basic Path	1. The user will be on the homepage of the software 2. The user will need to left click the interviewer button to select the student view
Alternative Paths	None
Postcondition	The user is navigated to the interviewee view page and the page successfully loads
Exception Paths	None
Other	None

USE CASE 5

3.3.6 Use Case #6

Use Case Name	Interviewee View
Reference	Section 3.2.6
Trigger	The user selects the interviewee button
Precondition	The user has already launched the software and is on the opening screen.
Basic Path	1. The user will be on the homepage of the software 2. The user will need to left click the interviewee button to select the student view
Alternative Paths	None
Postcondition	The user is navigated to the interviewee view page and the page successfully loads
Exception Paths	None
Other	None

USE CASE 6

3.3.7 Use Case #7

Use Case Name	Exporting CSV/PDF Files
Reference	Section 3.2.7
Trigger	A button present on the teacher | interviewer page
Precondition	The code has been compiled and catalogued by the user
Basic Path	1. Load code 2. Run code 3. Left Click the Button 4. Select the Save Path (handled by browser)
Alternative Paths	None
Postcondition	Storage size is acceptable
Exception Paths	none
Other	None

USE CASE 7

3.3.8 Use Case #8

Use Case Name	Highlight Differences in Output
Reference	Section 3.2.8
Trigger	Student Runs code
Precondition	code is valid
Basic Path	1. User loads file 2. User runs file
Alternative Paths	None
Postcondition	None
Exception Paths	None
Other	None

USE CASE 8

3.3.9 Use Case #9

Use Case Name	Run Student/Interviewee view code
Reference	Section 3.2.9
Trigger	Run Button
Precondition	Code is valid
Basic Path	1. User load code 2. User runs code
Alternative Paths	None
Postcondition	None
Exception Paths	None
Other	None

USE CASE 9

3.3.10 Use Case #10

Use Case Name	Comparing code to given output within output file
Reference	Section 3.2.10
Trigger	Code is run
Precondition	Code is valid
Basic Path	1. Code is run 2. Comparison is run 3. Pretty Printed Comparison is generated and displayed
Alternative Paths	None
Postcondition	None
Exception Paths	None
Other	None

USE CASE 10

…

3.4 Non-Functional Requirements

Non-functional requirements may exist for the following attributes. Often these requirements must be achieved at a system-wide level rather than at a unit level. State the requirements in the following sections in measurable terms (e.g., 95% of transaction shall be processed in less than a second, system downtime may not exceed 1 minute per day, > 30 day MTBF value, etc.).

3.5.1 Performance

We expect in the early stages that this piece of software will run slowly, once a working model is in place a lot of work can be done with Flask to speed up, at the end of the day we would like it to work like a locally run browser.

3.5.2 Reliability

This application will be solid. There aside from leaning on other aspects out of our control (ie. browser errors, errors in users code) this application will run fine.

3.5.3 Availability

Because this application runs on PyPi we can quickly install it on any machine that runs python, this also handles any and all dependencies.

3.5.4 Security

Because every is run locally and users should only be running their code or the code of their students / interviewees, we hope that there is a level of trust.

3.5.5 Maintainability

The team uses github to sync all code this allows us to track and revert changes that break the application, there is *hopefully* going to be a git action that allows us to know if the code is good.

3.5.6 Portability

Because the application is easy to install it will make the software accessible to all accounts

3.5 Design Constraints

We are only controlled by the limits of Html & Css & Javascript

3.6 Logical Database Requirements

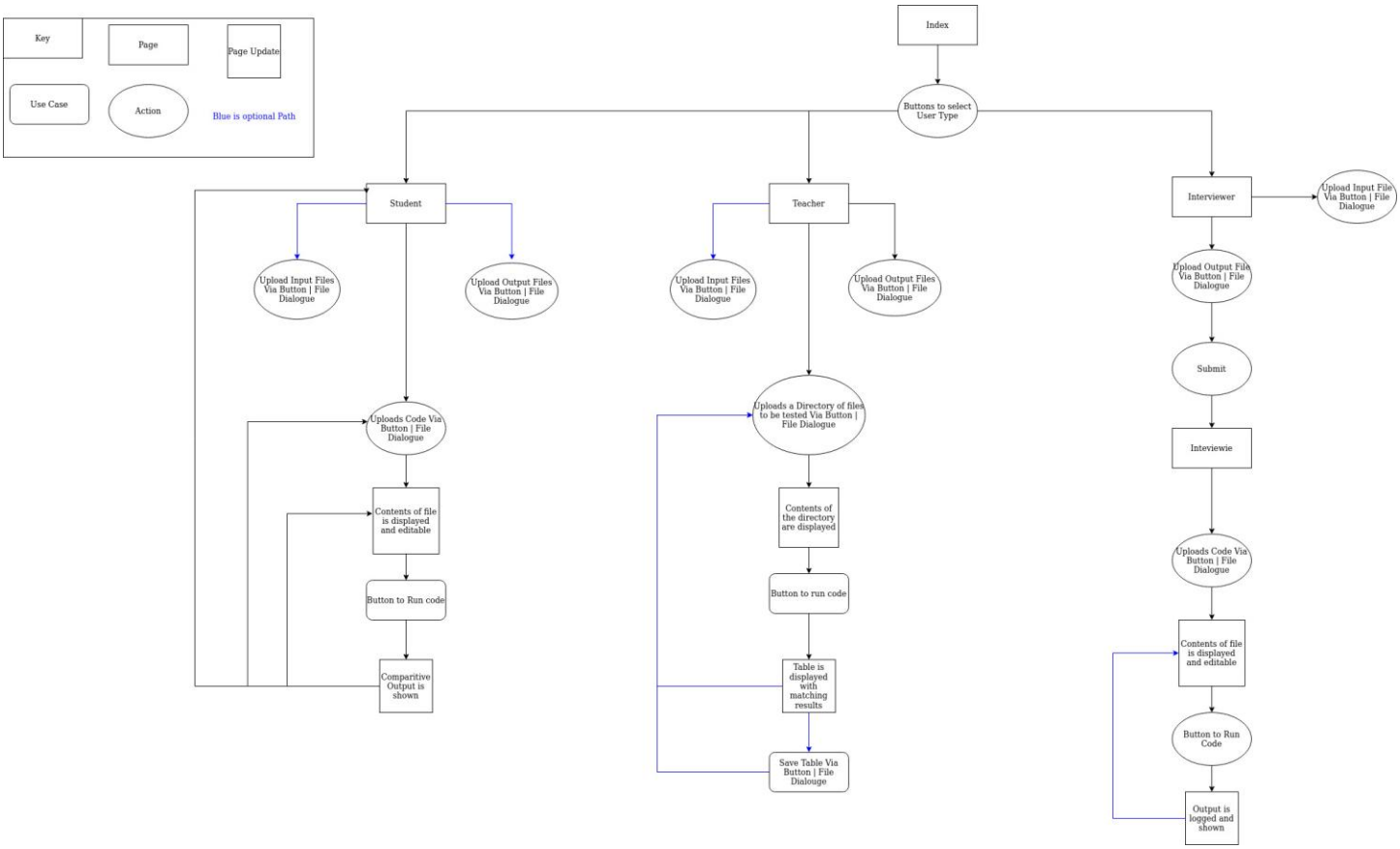
No Database will be needed for this project, at least within the current scope.

4. Analysis Models

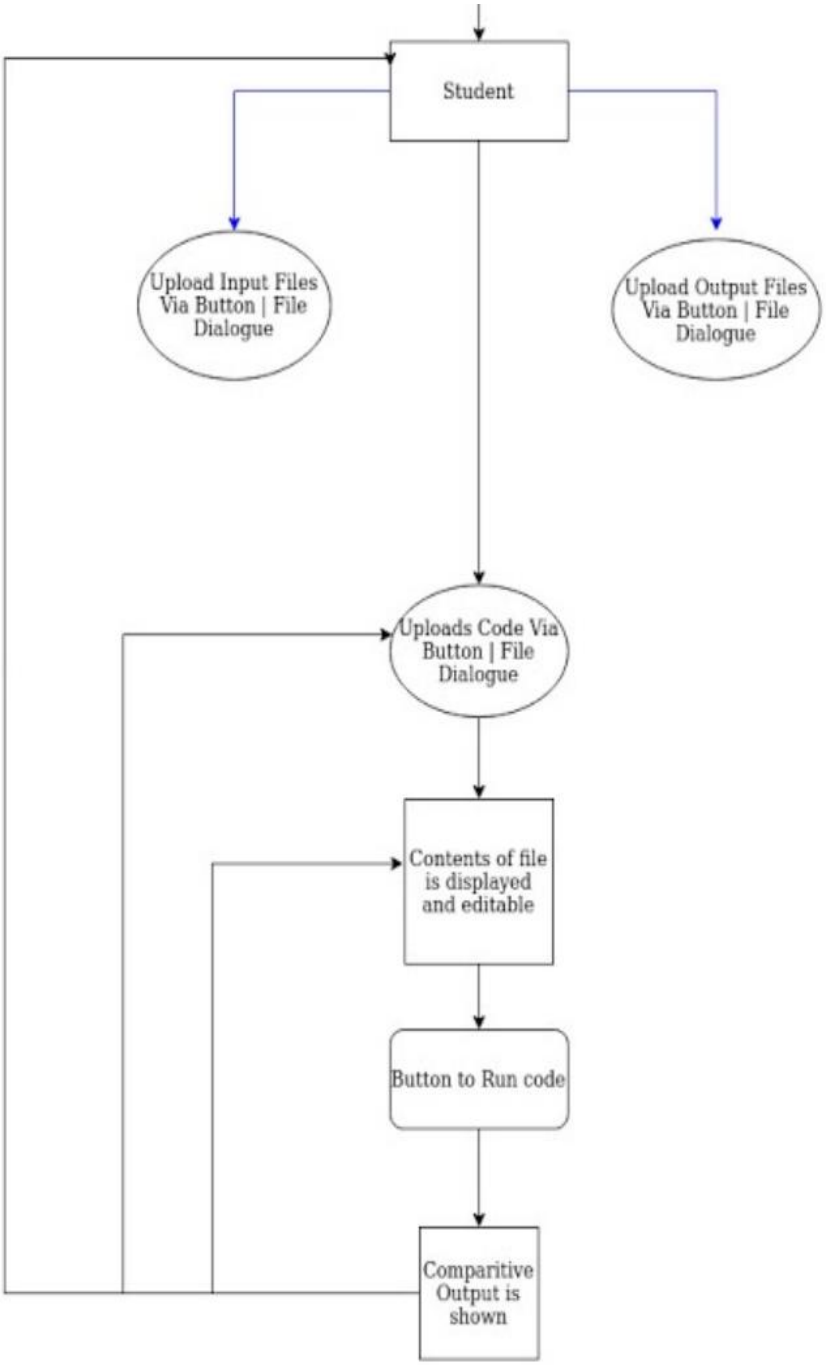
Sequence Diagrams

- All use cases are covered in the general graph as seen below

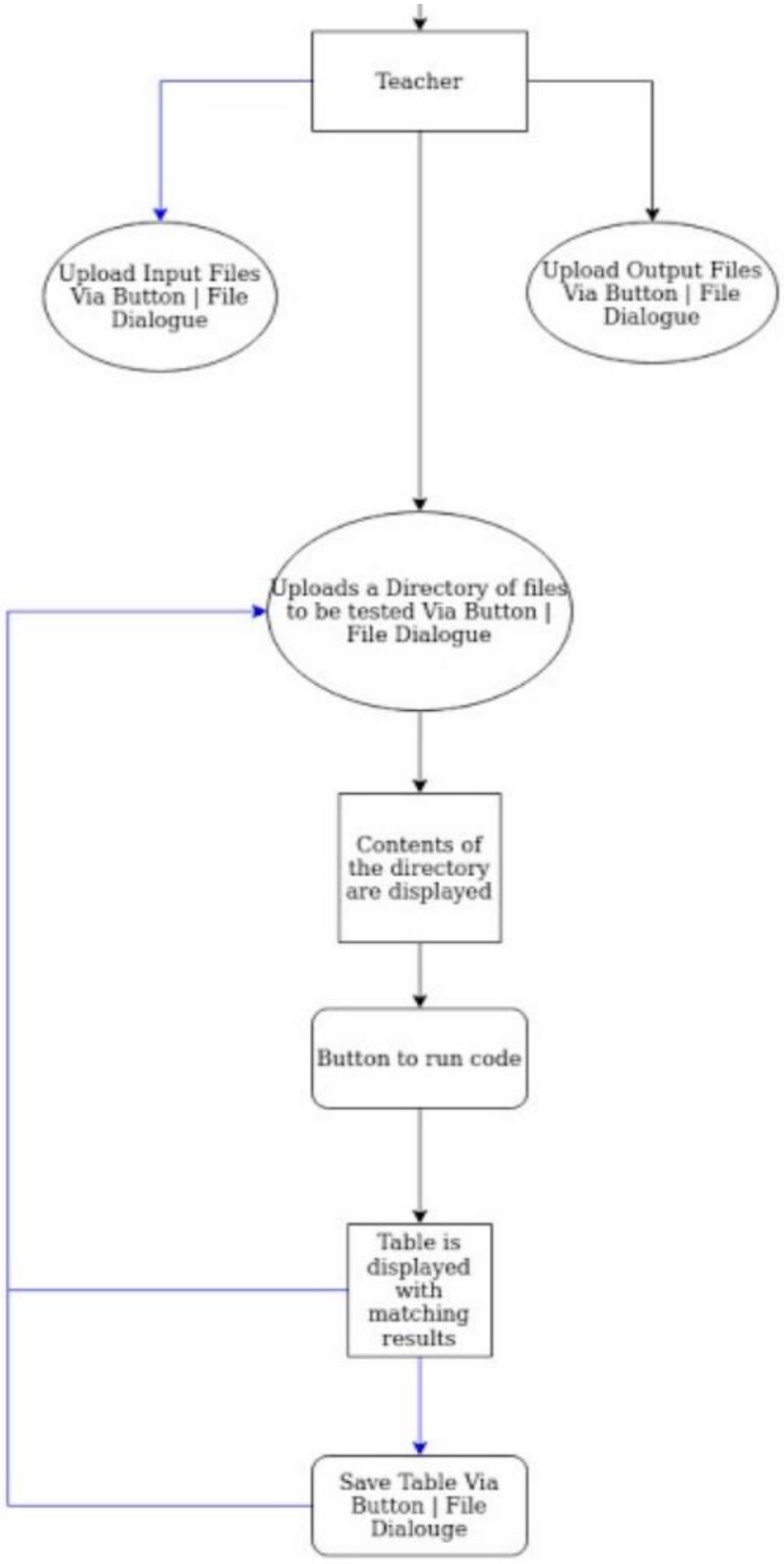
USE CASE: All



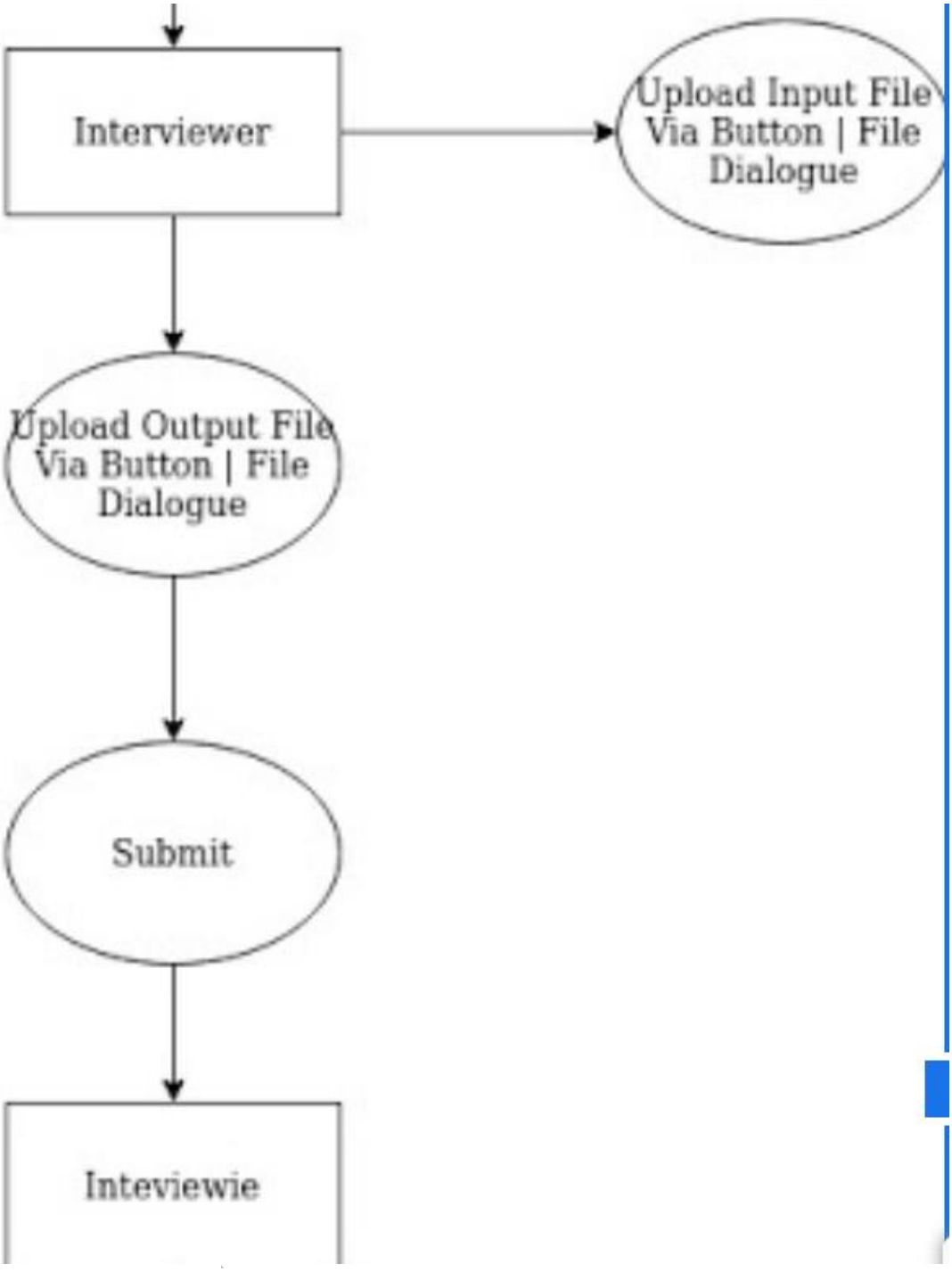
USE CASE: 3.3.4


Student
Upload Input Files Via Button | File Dialogue
Upload Output Files Via Button | File Dialogue
Uploads Code Via Button | File Dialogue
Contents of file is displayed and editable
Button to Run code
Comparitive Output is shown

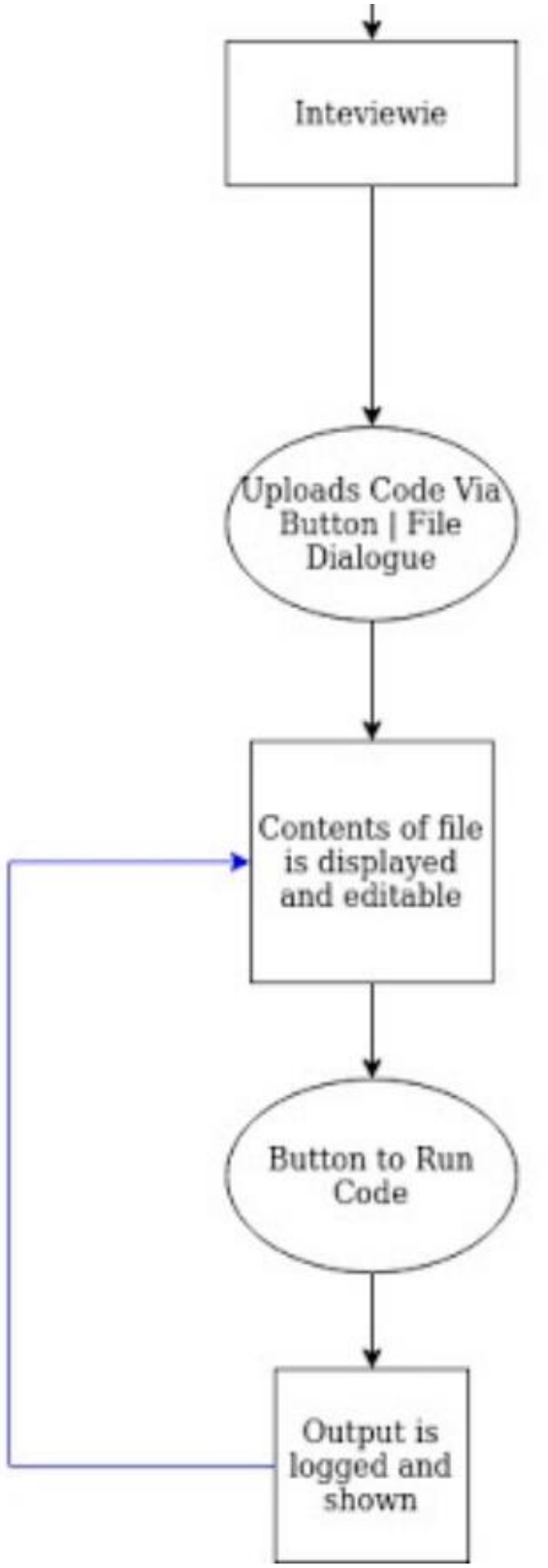
USE CASE: 3.3.3


Teacher
Upload Input Files Via Button | File Dialogue
Upload Output Files Via Button | File Dialogue
Uploads a Directory of files to be tested Via Button | File Dialogue
Contents of the directory are displayed
Button to run code
Table is displayed with matching results
Save Table Via Button | File Dialouge

USE CASE: 3.3.5:


Interviewer
Upload Input File Via Button | File Dialogue
Upload Output File Via Button | File Dialogue
Submit
Inteviewie

USE CASE: 3.3.6


Inteviewie
Uploads Code Via Button | File Dialogue
Contents of file is displayed and editable
Button to Run Code
Output is logged and shown

5. Change Management Process

This document will be changed by one (1) members of the group and then uploaded back to Github with a commit tag of "Updated the SRS <Date>" and update the table in Section 1 of this document

References

A. Appendices

<Appendices may be used to provide additional (and hopefully helpful) information. If present, the SRS should explicitly state whether the information contained within an appendix is to be considered as a part of the SRS's overall set of requirements. Example Appendices could include (initial) conceptual documents for the software project, marketing materials, minutes of meetings with the customer(s), etc.>

A.1 Appendix 1

A.2 Appendix 2