

## Implementation Manual

To create our Space Game application, we implemented five different classes. One of these classes is the App class, which extends Application from JavaFX. This class stores the display() method, which launches the pop-up window that lets the user know they have successfully completed the game. It also stores the createContent() method, which displays the main screen with the drop down menu, allowing the user to select from four different operations. In the createContent() method, there are event handlers which enable the application to switch scenes and take the user to their preferred practice game based on the option that they click on. In terms of attributes, the App class includes int resu1, resu2, number1, number2, counter, and LEVEL. The int resu1 stores the answer to the randomized question and int resu2 stores the answer that the user inputs. The int number1 and int number2 attributes are the two randomized numbers that are included in each question. The int counter stores the amount of questions that the user gets correct, and int LEVEL stores the number of questions you must answer correctly to complete the game.

The other four classes included are Addition, Subtraction, Multiplication, and Division, which all extend the App class. All of these classes have a constructor method which sets the text field that takes in the user input and the flag text that gives the user feedback. They also include a loadText() method, which sets the layout of the text and text fields and adds them to the pane. There are three other methods in each of these classes called submitBtn(), renewBtn(), and homeBtn(). These methods control what happens when the user clicks on the different buttons in the game. The submitBtn() method includes "if" statements that handle the events in which the user gets the answer correct or incorrect and the event in which they do not enter an integer. It also handles the event in which they get a total of ten questions right, calling the display() method from the App class. The renewBtn() method clears the user's input from the preceding question and gives the user a new question. Lastly, the homeBtn() method takes the user back to the main stage and includes the use of the createContent() method from the App class.