

Project Progress Report

Reporter: Bin and the Team

Date: April 20th 2020

1. Task Completed

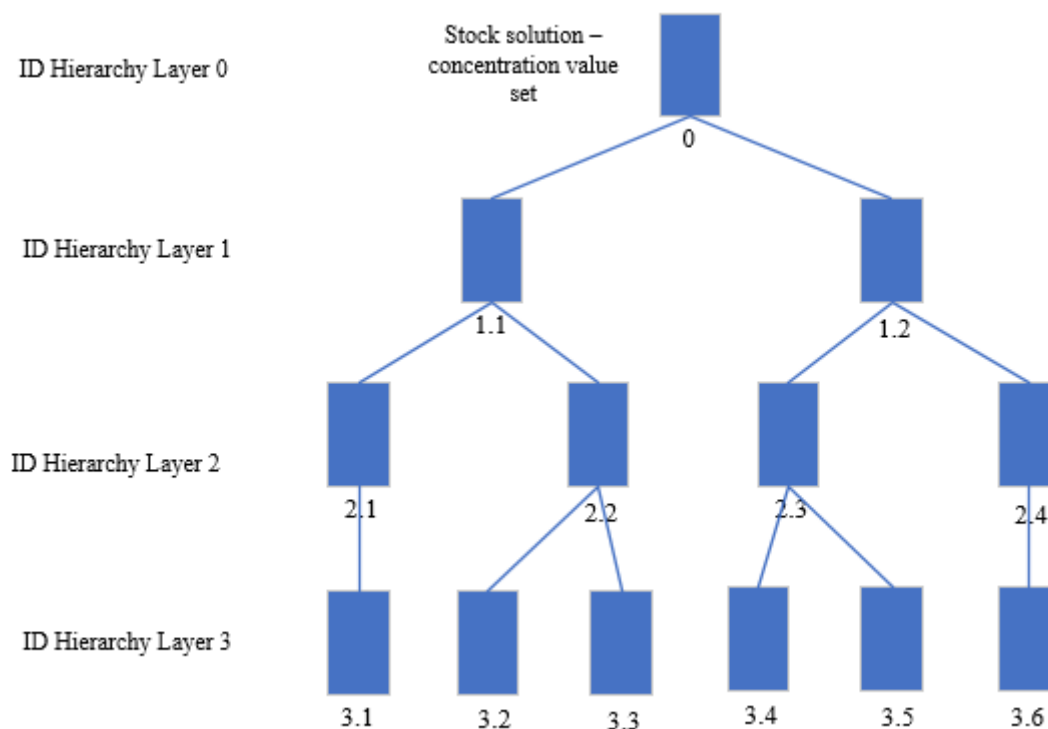
The basic structure of the new application has been completed. It can successfully add new dilutions or calibrants as required. The application can save the table data separately and later on can be imported into the application. The structure of the application is as

The screenshot shows the 'Report Builder' application window. On the left is a 'Pick Stock Solution' button and an 'Add New Solvent' section. This section has radio buttons for 'Dilution' and 'Calibration' (selected). It includes input fields for 'Calibrant ID' (7), 'Dilution ID' (1.1), 'Solution Quantity' (30 mL), 'Solvent Quantity' (100 mL), and 'Result Unit' (mg/L). An 'OK' button is at the bottom. On the right are two tables. The 'Dilution Table' has columns: Dilution ID, Previous Dilution, Solution Quantity, Solvent Quantity, and Concentration. The 'Calibration Table' has columns: Calibrant ID, Dilution ID, Solution Quantity, Solvent Quantity, and Concentration.

Dilution ID	Previous Dilution	Solution Quantity	Solvent Quantity	Concentration
0	0	100.0 mL	100.0 mL	1000.00000 mg/L
1.1	0	40.0 uL	20.0 mL	2.00000 mg/L
1.2	0	40.0 uL	40.0 mL	1.00000 mg/L
2.1	1.1	500.0 uL	10.0 mL	0.10000 mg/L
2.2	1.1	500.0 uL	20.0 mL	0.05000 mg/L
3.1	2.1	800.0 uL	20.0 mL	0.00400 mg/L

Calibrant ID	Dilution ID	Solution Quantity	Solvent Quantity	Concentration
1	2.1	5.0 mL	100.0 mL	0.00500 mg/L
2	2.1	10.0 mL	100.0 mL	0.01000 mg/L
3	2.1	40.0 mL	100.0 mL	0.04000 mg/L
4	1.1	5.0 mL	100.0 mL	0.10000 mg/L
5	1.1	10.0 mL	100.0 mL	0.20000 mg/L
6	1.1	20.0 mL	100.0 mL	0.40000 mg/L
7	1.1	30.0 mL	100.0 mL	0.60000 mg/L

I use the new ID hierarchy system for dilution process. For example, if the Dilution ID is 2.1, the number before the decimal point (2) indicates the hierarchy layer, and the number after the decimal point (1) represents which dilution was conducted in this layer. The dilution ID hierarchy system is explained as



In the calibration process, the new calibrants can be generated from any dilution solution from different hierarchy layers. The dilutions used in generating calibrants are in the Dilution Table.

The data generated from this application can be saved as either .dil files or .cal files. Different filename extension stands for different tables. Similarly, when opening the files, the chosen file with particular filename extension will be shown in different tables. Detailed information will be illustrated in the next chapter.

2. Application Guide-through

Step 1: Add the stock solution:

Pick Stock Solution

Add New Solvent

Dilution or Calibration: ☒ Dilution ☐ Calibration

Dilution ID:

Previous Dilution Used:

Solution Quantity: mL

Solvent Quantity: mL

Result Unit:

Dilution Table

Dilution ID	Previous Dilution	Solution Quantity	Solvent Quantity	Concentration
0	0	100.0 mL	100.0 mL	1000.00000 mg/L

Ideally, the original solution should be shown in the table after selecting it by clicking the **Pick Stock Solution**. At this moment, it is designated by using 100 mL for both solution quantity and solvent quantity. **The previous Dilution used should be set as 0**, indicating that the original solution is used for this dilution.

Step 2: Add new dilutions:

Add New Solvent

Dilution or Calibration:
☒ Dilution
☐ Calibration

Dilution ID:

Previous Dilution Used:

Solution Quantity: uL

Solvent Quantity: mL

Result Unit: mg/L

Dilution Table

Dilution ID	Previous Dilution	Solution Quantity	Solvent Quantity	Concentration
0	0	100.0 mL	100.0 mL	1000.00000 mg/L
1.1	0	40.0 uL	20.0 mL	2.00000 mg/L
1.2	0	30.0 uL	20.0 mL	1.50000 mg/L

You may add as much solutions as you desire. But the **Dilution ID should be unique** for reference purpose in other dilutions or calibrations. **You may also delete any rows** if they are not satisfying.

Dilution ID	Previous Dilution	Solution Quantity	Solvent Quantity	Concentration
0	0	100.0 mL	100.0 mL	1000.00000 mg/L
1.1	0	40.0 uL	20.0 mL	2.00000 mg/L
1.2	0	30.0 uL	20.0 mL	1.50000 mg/L

Delete row
Reorder Column

Step 3: Add new calibrants:

Add New Solvent

Dilution or Calibration:
☐ Dilution
☒ Calibration

Calibrant ID:

Dilution ID:

Solution Quantity: mL

Solvent Quantity: mL

Result Unit: mg/L

Dilution Table

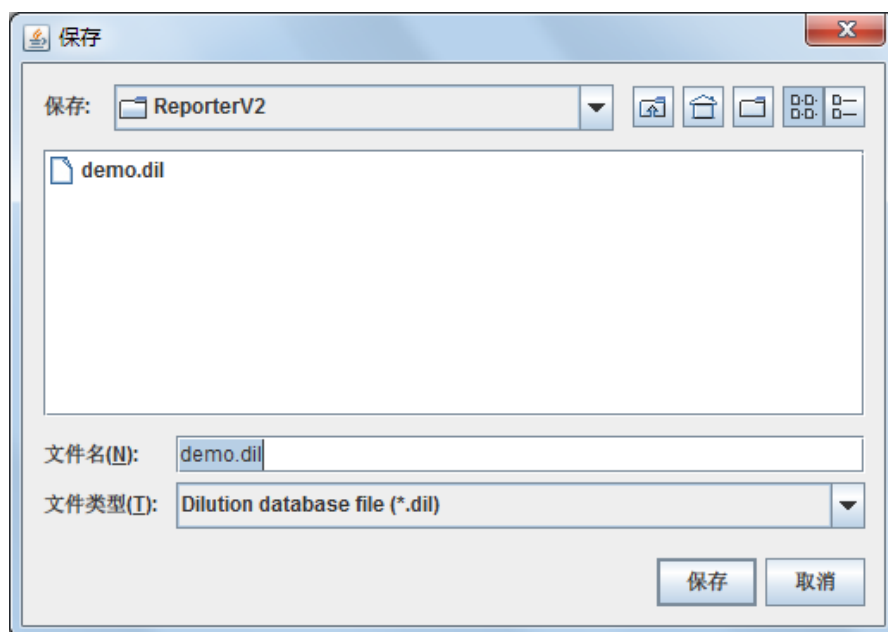
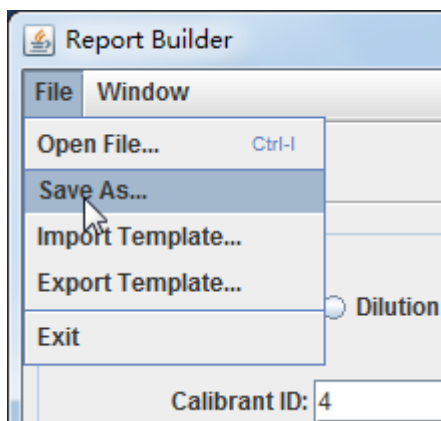
Dilution ID	Previous Dilution	Solution Quantity	Solvent Quantity	Concentration
0	0	100.0 mL	100.0 mL	1000.00000 mg/L
1.1	0	40.0 uL	20.0 mL	2.00000 mg/L
1.2	0	40.0 uL	40.0 mL	1.00000 mg/L
2.1	1.1	500.0 uL	10.0 mL	0.10000 mg/L
2.2	1.1	500.0 uL	20.0 mL	0.05000 mg/L
3.1	2.1	800.0 uL	20.0 mL	0.00400 mg/L

Calibration Table

Calibrant ID	Dilution ID	Solution Quantity	Solvent Quantity	Concentration
1	2.1	5.0 mL	100.0 mL	0.00500 mg/L
2	2.1	10.0 mL	100.0 mL	0.01000 mg/L
3	2.1	40.0 mL	100.0 mL	0.04000 mg/L

Option button for Calibration should be selected in this step. You can add a new calibrant after the dilutions used in generating this calibrant is completed and can be referenced.

Step 4: Save data and open data:



After the dilutions and calibrations are generated, they can be saved. **The filename extensions should be specified as .dil or .cal.** Different extensions represent different tables. If the file is saved as .dil file, only the Dilution Table is saved. If the file is saved as .cal file, only the Calibration Table is saved.

The same rule applies when the data is opened and displayed in tables. If the .dil file is opened, the dilution table saved before will be displayed and if the .cal file is opened, the calibration table saved before will be displayed.

3. Future tasks

Task	Description	Expected Complete Time
Generating and Importing Templates	The 'load curve template' would be able to load the set of instructions and feed a new original solution into it to generate a new set of calibrant values 'result set'. This is then saved with a unique name to be able to re-load as a 'result set' and view the calculations.	May 1 st 2020
Furnish the applications	There are other functions I designed like reordering the column or may later on be proposed by sponsor will be programmed out to polish this application.	May 8 th 2020
More tasks	The team, especially the team leader, is willing to carry more responsibilities in putting this application into practice. The team leader if possible, will take advantage of the 2 months semester break to incorporating more functions into this application like linking different databases, generating the calibrant curve and so on.	August 1 st 2020

4. Comments

1. As I mentioned in the last email, the java development has been shifted from BlueJ to Eclipse for better development experience and future application maintenance.
2. The application is still in primitive status. It needs further testing and improvement. For example, if the Dilution ID is not found in calibration process, there should be a warning dialog.