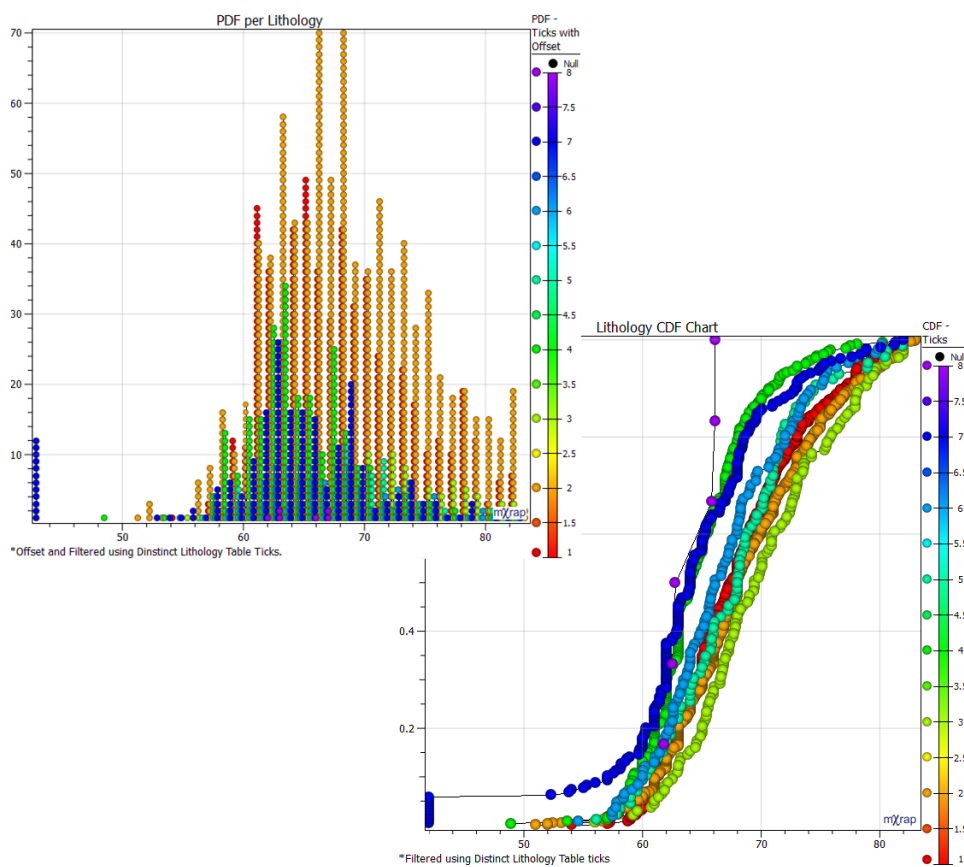




Rock Properties App Creation Walkthrough



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Introduction

The purpose of this walkthrough is to illustrate to the user how an mXrap application can be built to analyse a dataset. The walkthrough gives an overview on the different tools which can be created in mXrap. This manual is set up to be a step-by-step guide for app building.

This walkthrough will be looking at an imported excel database (in the form of a .csv file) which contains values for Rock Mass Ratings (RMR) related to various geological lithologies. Once imported into mXrap, this database will then be manipulated using various tools in the Settings and Analysis window.

This application will enable the user to view CDF and PDF charts of RMR values for various lithologies. It will also illustrate how to build the frontend for the app.

Table of Contents

Introduction	2
Structure of Walkthrough	5
Understanding the Data.....	5
1. Importing the CSV file into mXrap	6
Introduction to the Settings Window	6
Settings Step 01– Creating the CSV tool and Importing a CSV into mXrap	8
Settings Step 02 – Variables tool for importing .csv’s	11
Settings Step 01 Continued – Linking the Filename variable into the Import CSV.....	13
Introduction to Analysis Window	14
Analysis Step A – Creating a Table View for the Imported CSV	17
Application Progress (Section 1)	19
2. Creating a Distinct Table for the imported Geological Lithologies	20
Settings Step 03 – Creating a Distinct Table for Lithology	20
Analysis Step B – Viewing the Distinct Table for Lithologies	22
Settings Step 04 – Variables tool enabling tick boxes for the Distinct Table.....	23
Analysis Step B Continued – Adding Ticks Variable to the Distinct Lithology Table.....	25
Application Progress (Section 2)	26
3. Linking the two tables using a Table Map.....	28
Settings Step 05 – Creating a Table Map from the CSV table to the Distinct Lith table.....	28
Analysis Step C – Creating a Table View showing which Lithologies are “Ticked”	30
Application Progress (Section 3)	32
4. Creating a CDF table and chart for the Lithologies	34
Settings Step 06 – Row calculations to return the LithID as a number for CSV table	34
Settings Step 07 – Using an Accumulation tool to create a CDF table sorted per lithology.....	36
Settings Step 08 – Row calculations to return LithID as a number for Distinct Lith table.....	38
Settings Step 09 – Accumulations tool to Number the Lithologies in the Distinct Table	40
Analysis Step D – Creating a CDF chart for All Lithologies	42
Analysis Step E – Creating a CDF chart for the Ticked Lithologies	45
Application Progress (Section 4)	48
5. Calculating the Statistics per Lithology	50
Settings Step 10 – Accumulating the statistics for each lithology	50
Analysis Step F – Creating a Table View for the Statistics per Lithology	52
Application Progress (Section 5)	54
6. Creating PDF charts for the Lithologies	56
Settings Step 11 – Creating a Row Calculation to sort RMR data into bins.....	56

mXrap – Rock Properties App Creation Walkthrough

Settings Step 12 – Accumulations tool created for the PDF of the RMR values.....	58
Settings Step 13 – Creating an offset for the PDF chart using Row Calculations	60
Analysis Step G – Creating a PDF Chart of all Lithologies	62
Analysis Step H – Creating a PDF Chart for the Ticked Lithologies	65
Analysis Step I – Creating a PDF Chart for the Lithologies (Including an Offset)	67
Application Progress (Section 6)	69
7. Markers	70
Settings Step 14 – Marker Style created for each lithology.....	70
Settings Step 15 – Creating a new Marker Style for the Distinct Lithology Table	72
Application Progress (Section 7)	74
8. Interface.....	76
Interface submenu.....	76
Settings Step 16 – Creating a Variables Panel for the App	76
Settings Step 17 – Creating a Menu Definition for the Marker Styles.....	78
Settings Step 18 – Creating a Menu Definition for the Analysis Tools created	79
Settings Step 19 – Creating a Window Definition.....	81
Settings Step 20 – Creating an App definition to complete the App build process.....	82
Application Progress (Section 8)	83
9. Applying LithoID Markers.....	84
Analysis Step C Continued – Adding Markers to Complete Ticks Table	84
Analysis Step E Continued – Adding Markers to CDF Chart.....	86
Analysis Step I Continued – Adding Markers to PDF Chart.....	88
10. Applying Distinct Table Markers	90
Analysis Step B Continued – Adding Markers to Distinct Lithology Table	90
Analysis Step F Continued – Adding Markers to Statistics per Lithology Tableview	92
11. Application	94
Launching your App	94
Selecting what you want to see in your App	95
Saving the opened tabs so they appear every time the app is opened.....	96

Structure of Walkthrough

The walkthrough follows a step-by-step structure. Each step shows how the particular tool is built in the Settings Window with a brief description of why the tool is being built. The process followed to visualise these built tools in the Analysis Window is then illustrated.

After introducing the data that the app will use and discussing the importance of understanding the content of the database, the walkthrough will introduce the Settings Window followed by a few Settings Tools and then the Analysis Window followed by an Analysis Tool. This will serve as an introduction to the basic method of tool creation used throughout the rest of the walkthrough.

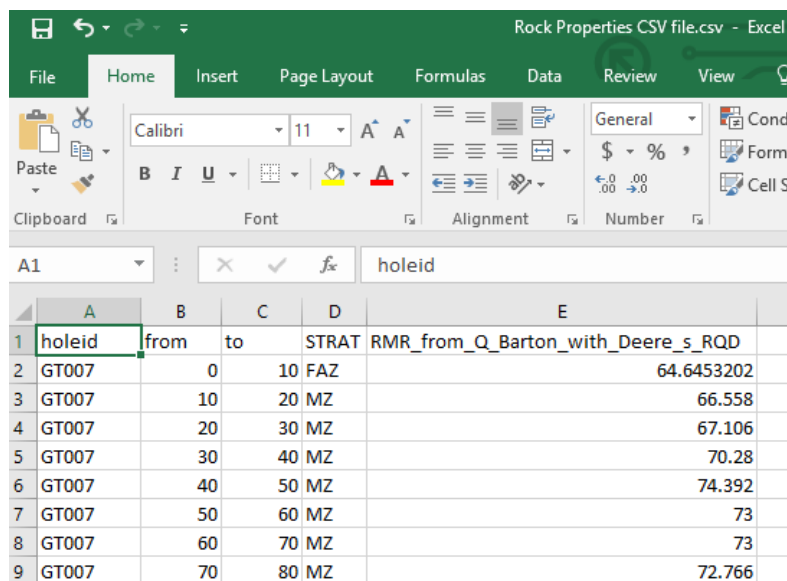
After building all of the necessary settings and analysis tools, we will introduce marker tools to colour the displayed data, as well as interface tools in which we will compile all of our work into an application.

Finally, the walkthrough will cover how to open the newly created app and set it up for future use.

Understanding the Data

Most commonly, the file type imported into mXrap will be in a .csv format (csv stands for comma-separated values). It is advised that the developer open the database in a program like Excel before building the app and to make sure that the context of the contents in the database are well understood.

In this case, we have a .csv file that contains four columns to represent rock quality per lithology. The data was obtained from borehole data from several boreholes, with an RMR calculated for each 10m section of borehole. The .csv is saved in the root folder under \#data\Rock Properties Example.



	A	B	C	D	E
1	holeid	from	to	STRAT	RMR_from_Q_Barton_with_Deere_s_RQD
2	GT007	0	10	FAZ	64.6453202
3	GT007	10	20	MZ	66.558
4	GT007	20	30	MZ	67.106
5	GT007	30	40	MZ	70.28
6	GT007	40	50	MZ	74.392
7	GT007	50	60	MZ	73
8	GT007	60	70	MZ	73
9	GT007	70	80	MZ	72.766

The columns represent the following

- holeid – Unique ID given to each borehole. There are several boreholes
- from – Start of the 10m section, measured in metres from surface in the negative z-direction
- to – End of the 10m section, measured in metres from surface in the negative z-direction
- STRAT – The dominant lithology type per borehole section
- RMR – Rock Mass Rating per depth

1. Importing the CSV file into mXrap

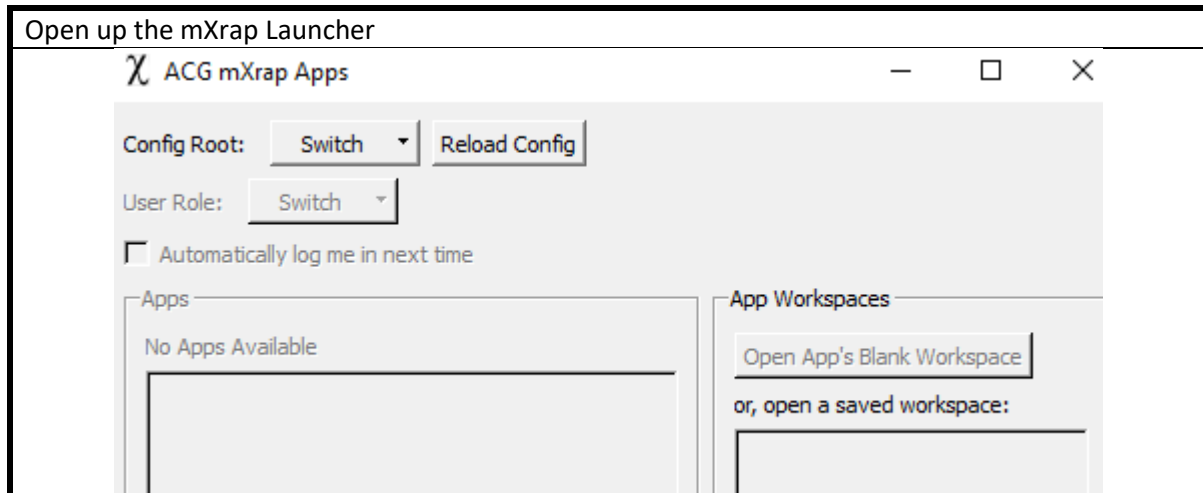
Introduction to the Settings Window

The Settings window is where the application tools are built. The right combination of created tools in the Settings window will form the backbone of the visual representations and calculations to be performed on the imported database.

The Settings Tools will be saved in the root folder under the directory:

#Beta Modules/IGM Rock Property Statistics Visualisation

Each step in the Settings window will be saved numerically eg Step 1 – Read CSV

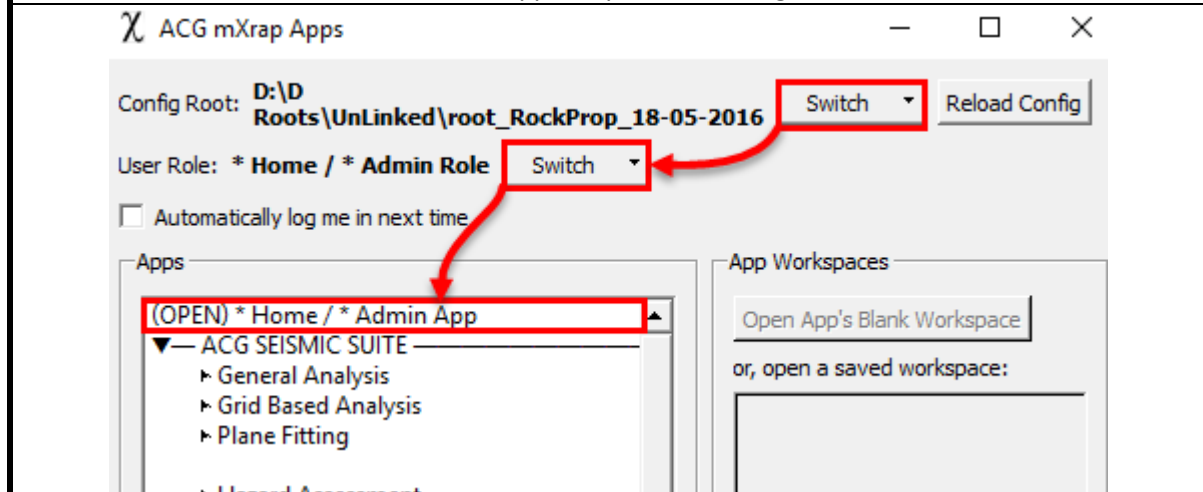


In the mXrap Launcher

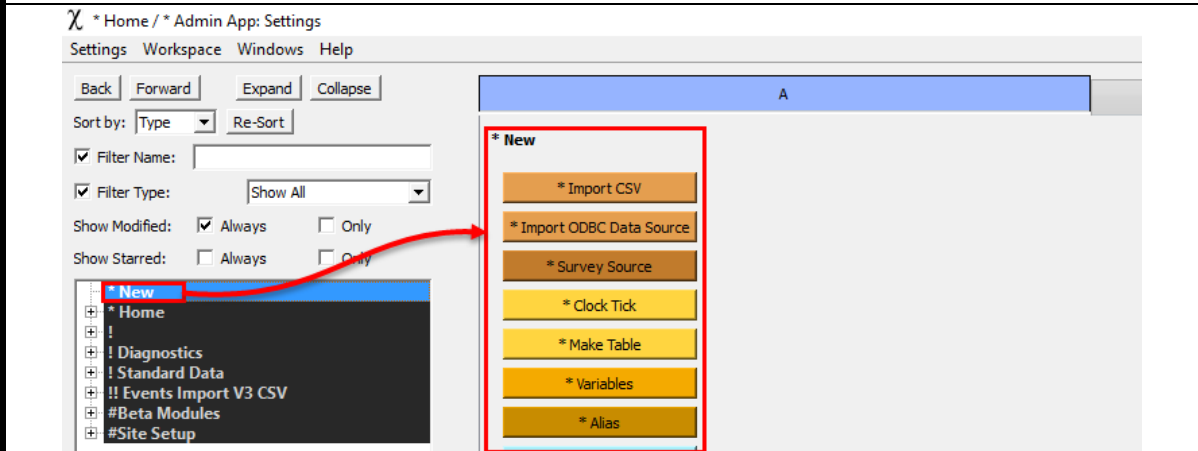
Left Click on the Config Root *Switch dropdown* and select the site root

Left Click on the User Role *Switch dropdown* and select the Home/Admin user role

Double left click on the **Home/*Admin app* to open the Settings window

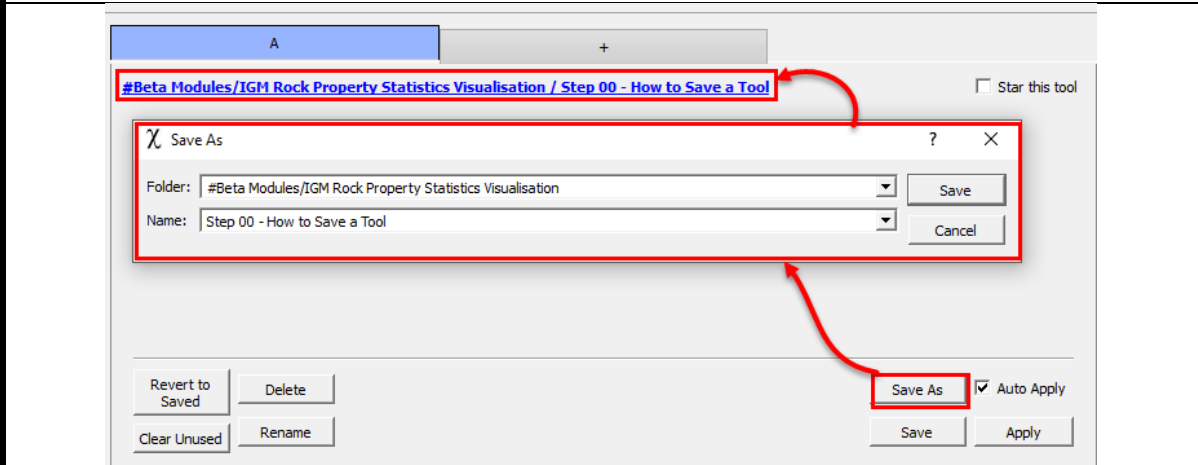


This is the Settings Window. Whenever new Settings Tools are created, the same process applies
Left click *New in the tool tree to bring up the tools available for creation
Left click the tool to be created

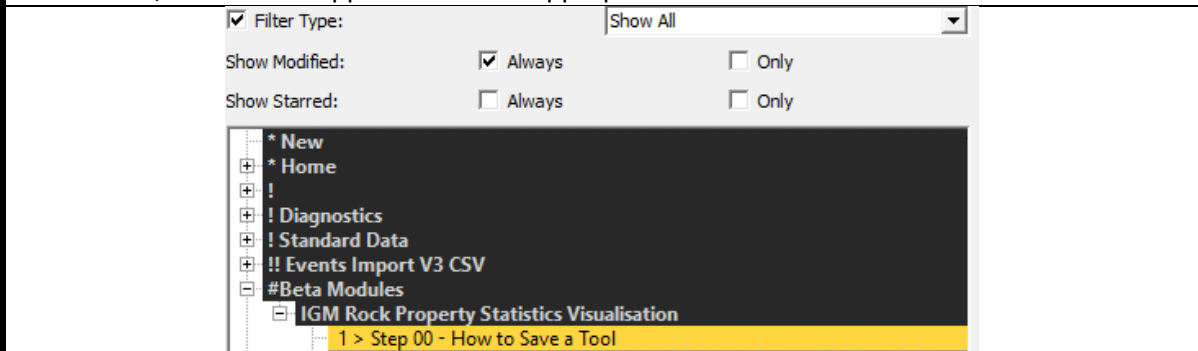


Once the tool is created, the first step is always to save the tool
 It is useful to give the tool a short, descriptive name
 In this example, the tools are given a Step number to make it easy for the reader to understand the flow of the process
Left click Save As in the bottom right corner of any tool
 Choose an appropriate folder location in which to save the tool as well as a tool name

Note: For this example, the folder location and tool name will be given for every tool created



Once saved, the tool will appear under the appropriate folder in the tool tree



Settings Step 01– Creating the CSV tool and Importing a CSV into mXrap

An Import CSV tool navigates to the directory where the CSV table is stored. These tables are normally stored in the site's mXrap root by the user.

Create and Save an Import CSV tool * Import CSV

Save As Folder: #Beta Modules/IGM Rock Property Statistics Visualisation
Name: Step 01 – Read CSV

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV Star this tool

Input File: Browse Link

Applied config will load file:

Columns | CSV Format | Translation | Cache | Results

Add Column Move Column Up Move Column Down

Import Results: 16:39:35 : ERROR: Source filename is blank. Reload File

Revert to Saved Delete Save As Auto Apply
Clear Unused Rename Save Apply

Left Click on the Input File *Browse* button

In the **Popup Window**, navigate to the Rock Properties CSV file location

Double Click on the file to add it in as the Input File

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV Star this tool

Input File: #data/Rock Properties Example/Rock Properties CSV file.csv Browse Link

Applied config will load file: #data/Rock Properties Example/Rock Properties CSV file.csv

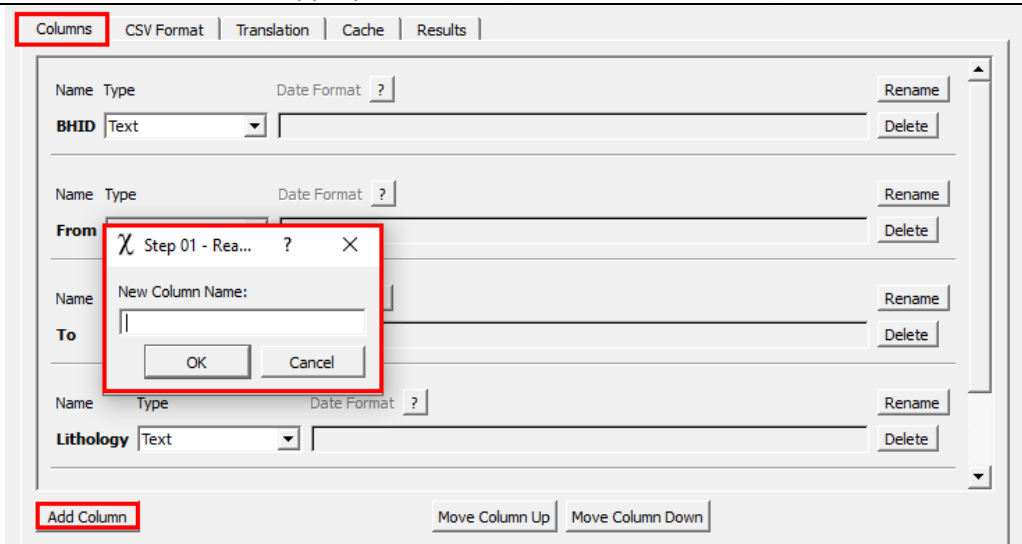
Columns | CSV Format | Translation | Cache | Results

The columns will now be added in the same sequence as they appear in the CSV file

Left Click on the *Columns* tab to open it

For each column:

- **Left Click** on the *Add Column* button
- Give the column the appropriate name (as seen in the CSV file)



Once the columns have been added, their type needs to be correctly assigned

Left Click on the *Columns* tab to open it

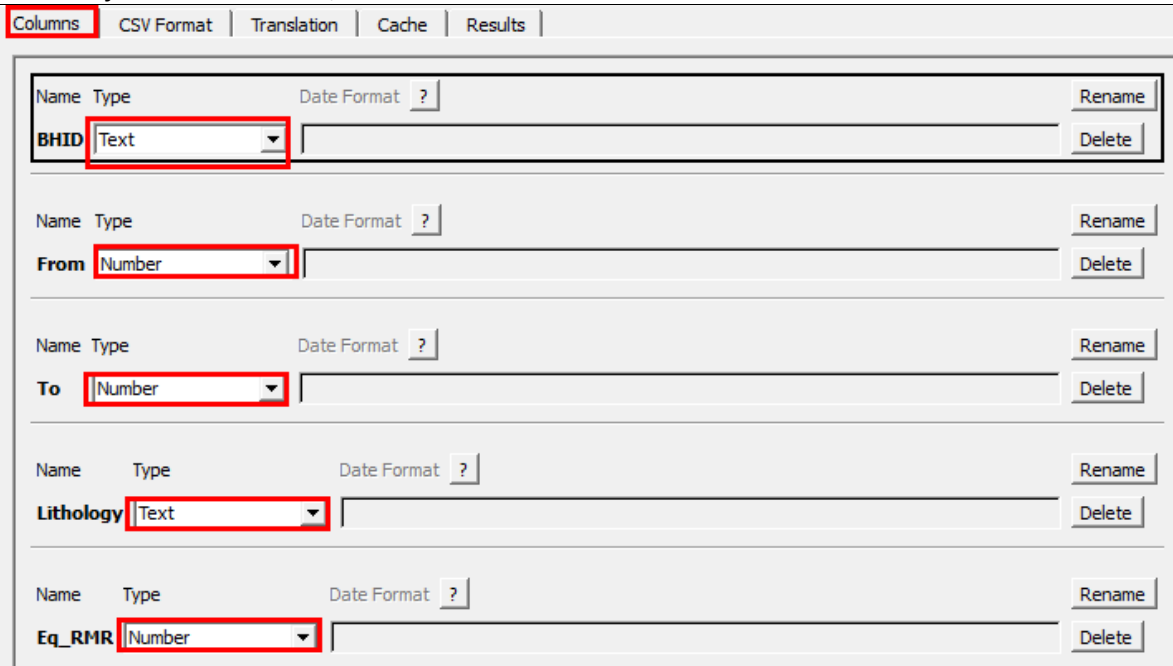
For each column:

- **Left Click** on the *Type* dropdown
- In the dropdown, **Left Click** the appropriate input type

The following inputs are “Number” type: **From, To, Eq_RMR**

The following inputs are “Text” type: **BHID, Lithology**

Note: If an ID consists only of numbers, the ID type can be selected. In our case, since the ID’s are a mixture of text and numbers, we need to select text.



The CSV Format will now be entered

Left Click on the *CSV Format* tab to open it

Left Click on the *File Must Exist* check box

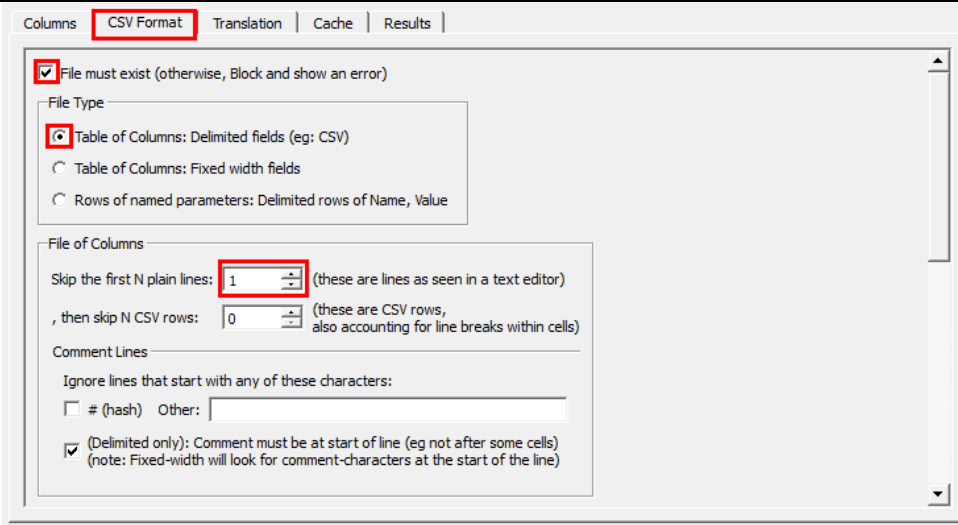
This means that the app will show an error if the file is not found in the selected location

Under File Type, **Left Click** on the *Table of Columns: Delimited fields* toggle

This is appropriate as the input file is in fact a CSV

Under File of Columns, **Left Click** on the *Skip the first N plain lines* box and **change** it to 1

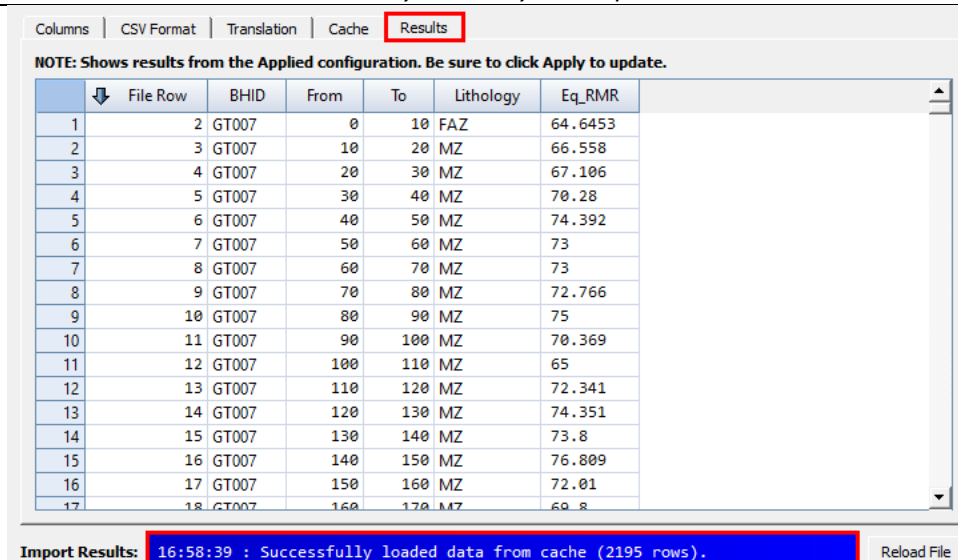
Since the CSV files contain headings, skipping the first line means mXrap won't attempt to read the headings as data



Left Click on the *Results* tab to view the imported file.

The Import Results **dialogue** will show any errors if the file could not be loaded as configured

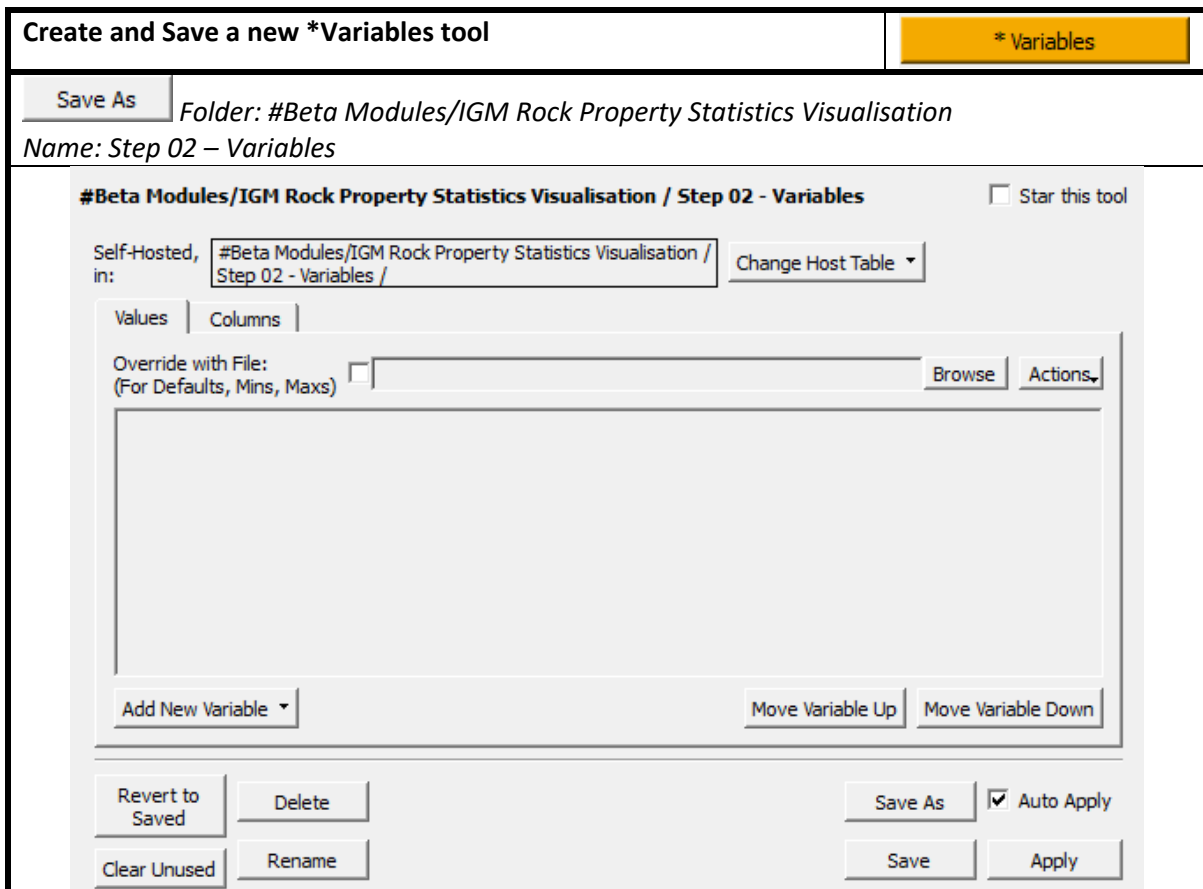
Note: The File Row column is automatically added by the Import CSV tool



Save the Tool

Settings Step 02 – Variables tool for importing .csv's

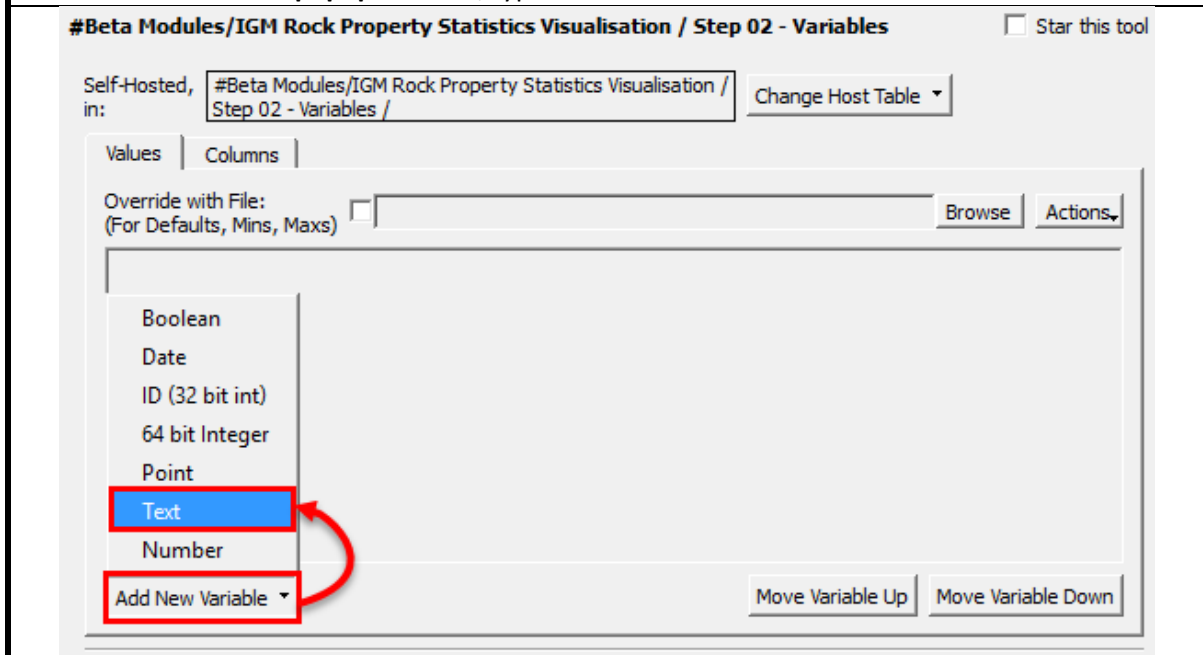
The following variables tool allows the user to choose which csv to import into the application. Note that the databases need to maintain the same format to be uploaded successfully.



Left Click on the *Values* tab to open it

Left Click on the *Add New Variable* dropdown

In the *New Text Name* popup window, type in "Filename"



In the Filename variable, **Left Click** the *File to load* toggle
This allows the values above to be set to a file location
Left click on the *Value* and *Default* checkboxes to select them

For the *Value* and *Default* fields
Left click on the *Browse* buttons

In the **Popup Window**, navigate to the Rock Properties CSV file location
Double Click on the file to add it in as the Value and Default

Note: This variable will be editable by a user in the application. To avoid the user accidentally losing the file location, the default is set to easily navigate the user back to the original input file location.

Filename

Value: #data/Rock Properties Example/Rock Properties CSV file.csv **Browse** Link D

Default: #data/Rock Properties Example/Rock Properties CSV file.csv **Browse**

Minimum: Browse

Maximum: Browse

Allow value to be Null

Text Input Style

File to load Multi-lines Existing folder

File to save to

Save the Tool

Settings Step 01 Continued – Linking the Filename variable into the Import CSV

Open the Read CSV tool created earlier	1 > Step 01 - Read CSV
Left click on the <i>Link</i> button next to the <i>Input File</i> box	
<div style="border: 1px solid #ccc; padding: 10px;"> <p>#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV <input type="checkbox"/> Star this</p> <p>Input File: <input checked="" type="checkbox"/> <input type="text" value="Rock Properties Example/Rock Properties CSV file.csv"/> Browse Link</p> </div>	
<p>In the popup window, the Inputs now need to be selected Under the <i>Tables</i> section, Left Click on the <i>Step 02 – Variables</i> table Now, under the <i>Columns in Table</i> section, Left Click on the <i>Filename</i> column Left Click on the <i>Use Selected Column</i> button to link the variable in</p>	
<div style="border: 1px solid #ccc; padding: 10px;"> <p>Input File</p> <p>Tables</p> <p><input checked="" type="checkbox"/> Filter tables by name: <input type="text"/></p> <p>Expand All Collapse All <input type="checkbox"/> Show tables from my category only</p> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> <ul style="list-style-type: none"> ! Standard Data #Beta Modules <ul style="list-style-type: none"> IGM Rock Property Statistics Visualisation <ul style="list-style-type: none"> Step 02 - Variables #Old </div> <p>Columns in Table (above)</p> <p><input checked="" type="checkbox"/> Filter columns by name: <input type="text"/></p> <p><input type="checkbox"/> My category only <input type="checkbox"/> Filter type: <input type="text" value="Text"/></p> <p>Expand All Collapse All</p> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> <ul style="list-style-type: none"> #Beta Modules <ul style="list-style-type: none"> IGM Rock Property Statistics Visualisation <ul style="list-style-type: none"> Filename </div> <p style="text-align: right;">Use Selected Column</p> <p style="text-align: right;">Reset Column</p> </div>	
The variable should now be linked in as follows	
<div style="border: 1px solid #ccc; padding: 10px;"> <p>#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV</p> <p>Input File: <input type="text" value="Table: #Old/IGM Rock Property Statistics Example / Step 02 - Variables"/> <input type="text" value="Column: #Old/IGM Rock Property Statistics Example / Step 02 - Variables / Filename"/> Link</p> </div>	
Save the Tool	

Introduction to Analysis Window

The Analysis Window is where the data that's been imported and manipulated in the Settings Window is displayed in the form of Charts, Table Views and 3D Views. These are also the visual elements that will be incorporated in to the frontend of the app.

The Analysis Tools will be saved in the root folder under the directory:

#Beta Modules/IGM Rock Property Statistics Visualisation

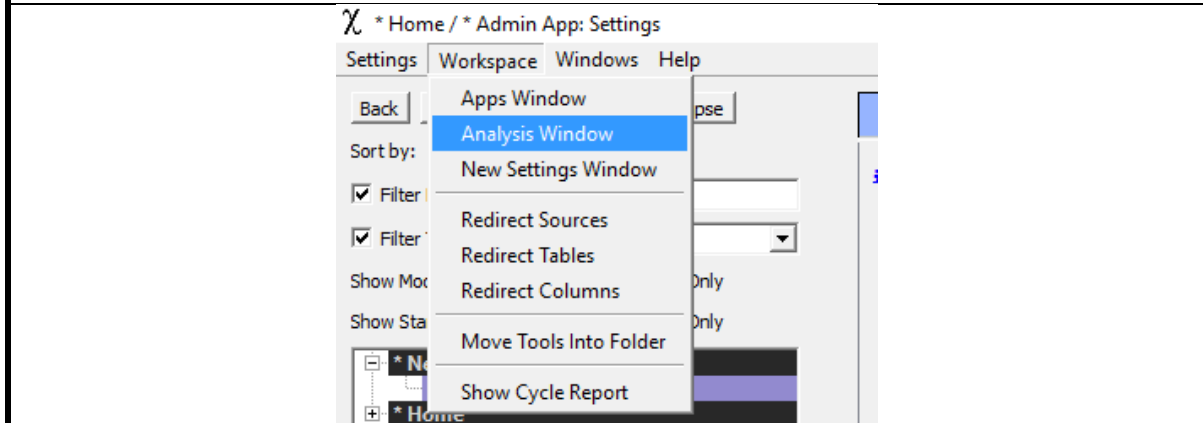
Each step in the Analysis window will be saved alphabetically eg Step A – Full Dataset Tableview

In the Settings window menu

Left Click on the *Workspace* dropdown menu

Left Click on *Analysis Window*

Note: This will open the Analysis window in which Table Views, Charts and 3D Views can be created.



To create a new Chart/Table View/3D View:

Left click *New and choose the tool to create

Left click the *Configure Page* button at the bottom left of the screen

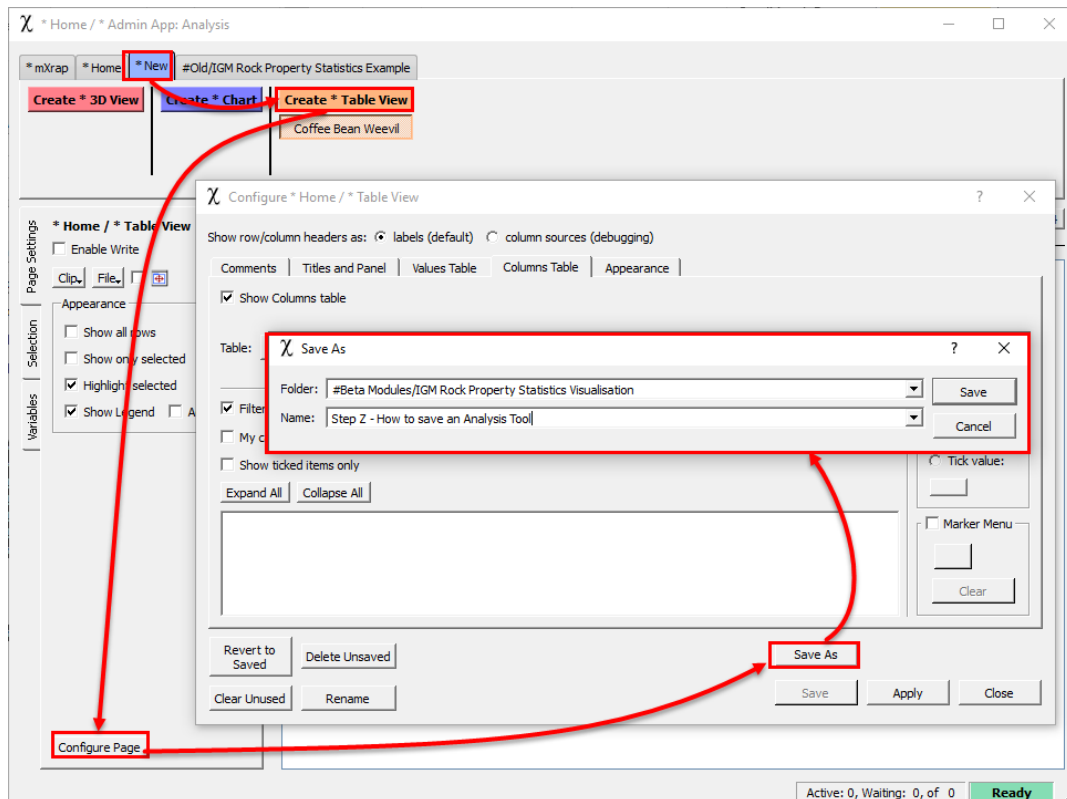
In the *Configure Page* popup

Left click on the *Save As* button

In the *Folder* **textbox**, navigate to the same directory used for the Settings Window tools

In the *Name* **textbox**, give the Analysis tool an appropriate name

Note: For this example, the folder location and tool name will be given for every tool created



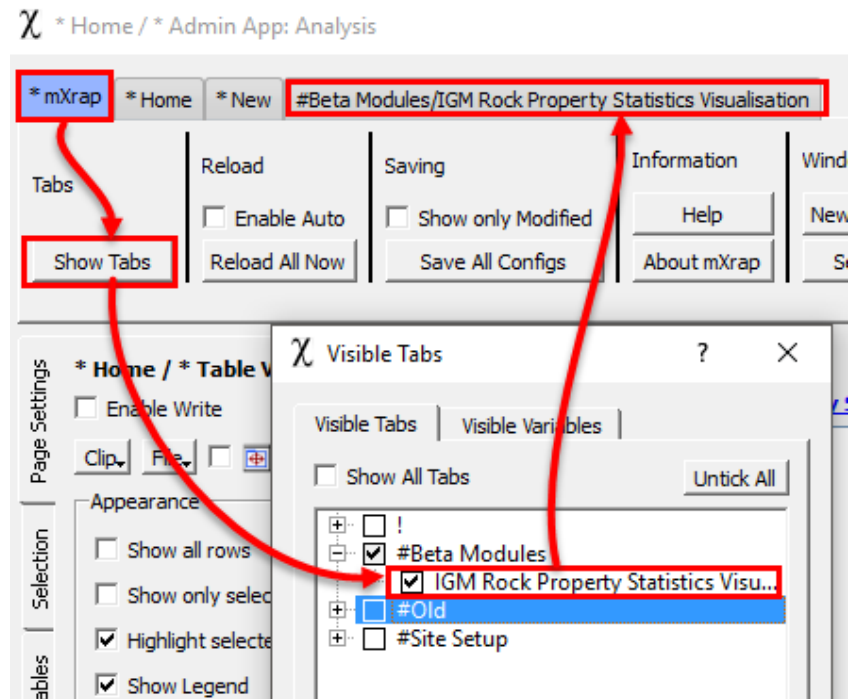
To view the Saved tools created in Analysis View

Left click on the **mXrap* button

Left click on the *Show Tabs* button

In the *Visible Tabs* popup, navigate to and **tick** the folder in which the tools are saved

This will open a new tab showing all the created tools



Analysis Step A – Creating a Table View for the Imported CSV

Create and Save a new *Table View
Create * Table View

Save As Folder: #Beta Modules/IGM Rock Property Statistics Visualisation
 Name: Step A – Full Dataset Tableview

Left click on the Configure Page button
 In the *Configure page popup*:

- **Left click on the Columns Table tab**
- **Left click on the Table button**
 - In the *Choose the Table to View popup*, navigate to the Read CSV Table
- **Left click on the Filter button**
 - In the *Set the default Filter popup*, navigate to *All Rows
- **Left click on the ID button**
 - In the *Set ID popup*, set the ID to Read CSV
- In the *Columns Tree*, **tick** all the columns under the CSV table

Show row/column headers as: labels (default) column sources (debugging)

Comments | Titles and Panel | Values Table | **Columns Table** | Appearance

Show Columns table

Table: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Filter: * All Rows Id: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV /

Filter columns by name:
 My category only Filter type: Filter
 Show ticked items only
Expand All Collapse All

- All Rows
- * Home
- #Beta Modules
 - IGM Rock Property Statistics Visualisation
 - Step 01 - Read CSV
 - BHID
 - Lithology
 - Eq_RMR
 - From
 - To

Ticks

Tick column:
 Tick value:

Marker Menu

Clear

Choose the Table to view

Tables

Filter tables by name:
Expand All Collapse All Show tables from my category only

- * Home
- !
- ! Diagnostics
- ! Standard Data
- !! Events Import V3 CSV
- #Beta Modules
 - IGM Rock Property Statistics Visualisation
 - Step 00 - How to Save a Tool
 - Step 01 - Read CSV**
 - Step 02 - Variables

Use Selected Table

Reset Table

Cancel

The Tableview should look something like this

Step Z - How to save an Analysis Tool
Step A - Full Dataset Tableview

#Beta Modules/IGM Rock Property Statistics Visualisation / Step A - Full Dataset Tableview

Enable Write

Clip

Appearance

Show all rows

Show only selected

Highlight selected

Show Legend Adj size

Edit 1 | 1 | ...

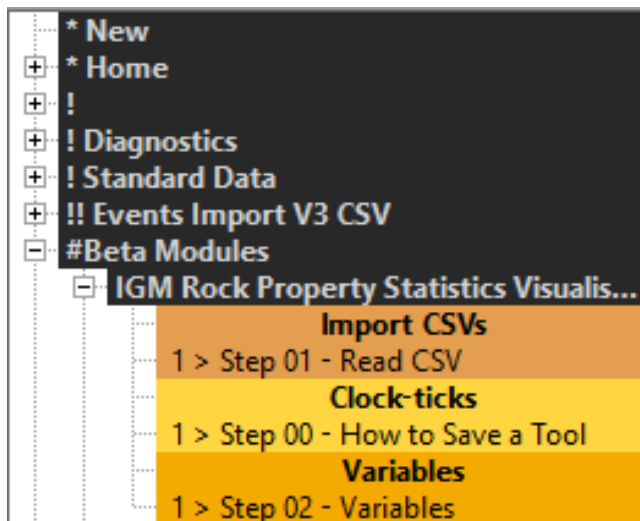
#Beta Modules/IGM Rock Property Statistics Visualisation / Step A - Full Dataset Tableview

	Step 01 - Read CSV	BHID	Eq_RMR	From	Lithology	To
1	2	GT007	64.6453	0	FAZ	10
2	3	GT007	66.558	10	MZ	20
3	4	GT007	67.106	20	MZ	30
4	5	GT007	70.28	30	MZ	40
5	6	GT007	74.392	40	MZ	50
6	7	GT007	73	50	MZ	60
7	8	GT007	73	60	MZ	70
8	9	GT007	72.766	70	MZ	80
9	10	GT007	75	80	MZ	90

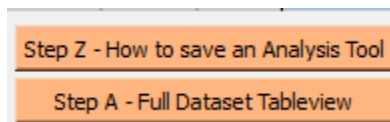
Left Click the Configure Page button and Save the Tool

Application Progress (Section 1)

The tool tree in the Settings Window should now look as follows. Following the naming convention will make it easier to follow the walkthrough steps.



The file has been imported and a variable created to enable the user of the app to change the input file from within the application. The file can also be viewed in the Analysis Window through a tableview.



In the next section, a Distinct Table will be created which will show each distinct lithology type contained within the database.

2. Creating a Distinct Table for the imported Geological Lithologies

Settings Step 03 – Creating a Distinct Table for Lithology

Using the values for Lithology in the imported csv file a Distinct Table, independent of the imported CSV table, is created to show all the unique lithologies from the original table.

Create and Save a new *Distinct Table tool
* Distinct Table

Save As
Folder: #Beta Modules/IGM Rock Property Statistics Visualisation

Name: Step 03 – Distinct Lithology Table

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology
 Star this tool

Configuration

Input Table :

Input Filter :

Generate a Row ID named: **Lith_ID** Rename

Make the ID Globally Unique (for this program instance) aka Auto-ID

Generate a new table with the new unique IDs and Input columns

Write the new ID back to the Input Table

Make a new table from a _____
distinct combination of these columns

Add a column

Requires Table and Filter

Revert to Saved
Delete

Save As
 Auto Apply

Clear Unused
Rename

Save
Apply

Left click on the *Input Table* button and in the *Table popup*, select the Read CSV table
Left click on the *Input Filter* button and in the *Filter popup*, select the *All Rows column

Tick the *Generate a Row ID named* button

Tick the *Write the new ID back to the Input Table* button

Configuration

Input Table : #Beta Modules/IGM Rock Property Statistics Visualisation /
Step 01 - Read CSV /

Input Filter : * All Rows

Generate a Row ID named: **Lith_ID** Rename

Make the ID Globally Unique (for this program instance) aka Auto-ID

Generate a new table with the new unique IDs and Input columns

Write the new ID back to the Input Table

Left Click on the *Add a column* button

In the *New Distinct Column* popup, navigate to the Lithology column of the Read CSV table

When **prompted**, give the New Distinct Column an appropriate name, in this case “Lithology”

The screenshot shows the mXrap application interface. A 'New Distinct Column' dialog box is open, displaying a tree view of tables and columns. The 'Step 01 - Read CSV' table is selected, and the 'Lithology' column is highlighted. The dialog box includes options for filtering columns and buttons for 'Use Selected Column', 'Reset Column', and 'Cancel'. Below the dialog box, a table lists the columns, with 'Lithology' (Texts) highlighted. A red box highlights the 'Add a column' button at the bottom of the table. Red arrows indicate the flow from the 'Add a column' button to the 'Lithology' column in the table, and from the 'Lithology' column in the table to the 'Lithology' column in the 'New Distinct Column' dialog box.

Save the Tool

Analysis Step B – Viewing the Distinct Table for Lithologies

Create and Save a new *Table View
Create * Table View

Save As Folder: #Beta Modules/IGM Rock Property Statistics Visualisation
 Name: Step B – Distinct Lithology Tableview

Left click on the *Configure Page* button
 In the *Configure page* **popup**:

- **Left click** on the *Columns Table* tab
- **Left click** on the *Table* button
 - In the *Choose the Table to View* **popup**, navigate to the Distinct Lithology Table
- **Left click** on the *Filter* button
 - In the *Set the default Filter* **popup**, navigate to *All Rows
- **Left click** on the *ID* button
 - In the *Set ID* **popup**, set the ID to Lith_ID

In the *Columns Tree*, **tick** the Lithology column under the Distinct Lithology Table

The Tableview should look something like this

#Beta Modules/IGM Rock Property Statistics Visualisation / Step B - Distinct Lithology Tableview

Enable Write Edit...

Clip File

Appearance

Show all rows

Show only selected

Highlight selected

Show Legend Adj size

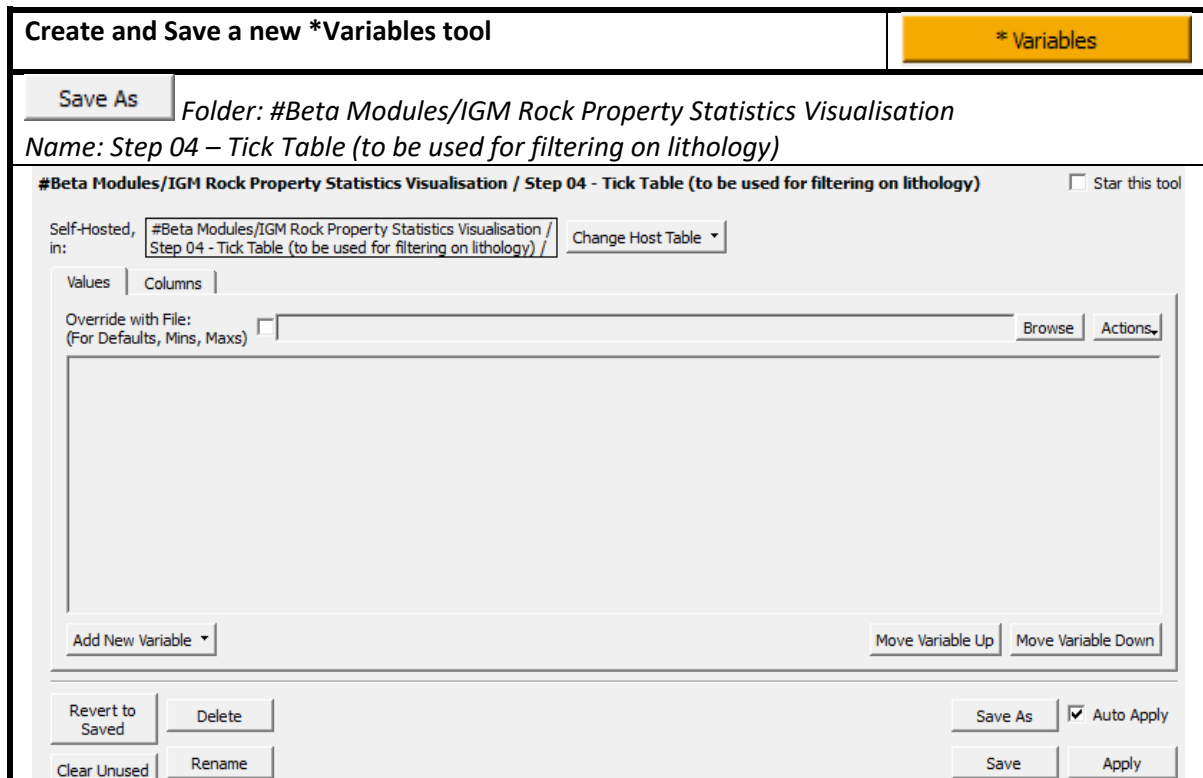
#Beta Modules/IGM Rock Propert

	Lithology
1	FAZ
2	MZ
3	NC1
4	NC2
5	PNZ
6	T1
7	T2L
8	T2U

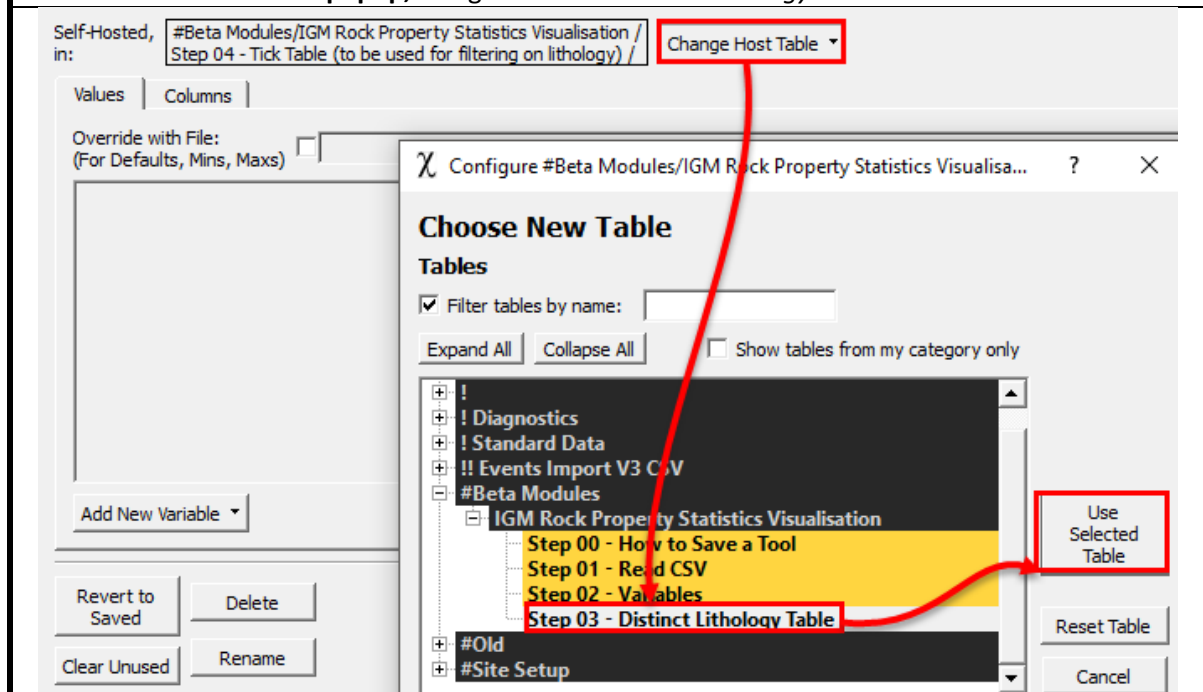
Left Click the Configure Page button and Save the Tool

Settings Step 04 – Variables tool enabling tick boxes for the Distinct Table

This variable will allow the user to tick and untick which lithology to be visualised.



Left click on the *Change Host Table* dropdown, and **left click** on the *Host in another table* button
 When **prompted** if all other tools should be redirected, **left click** on the *Yes* button
 In the *Choose New Table* popup, navigate to the *Distinct Lithology Table*

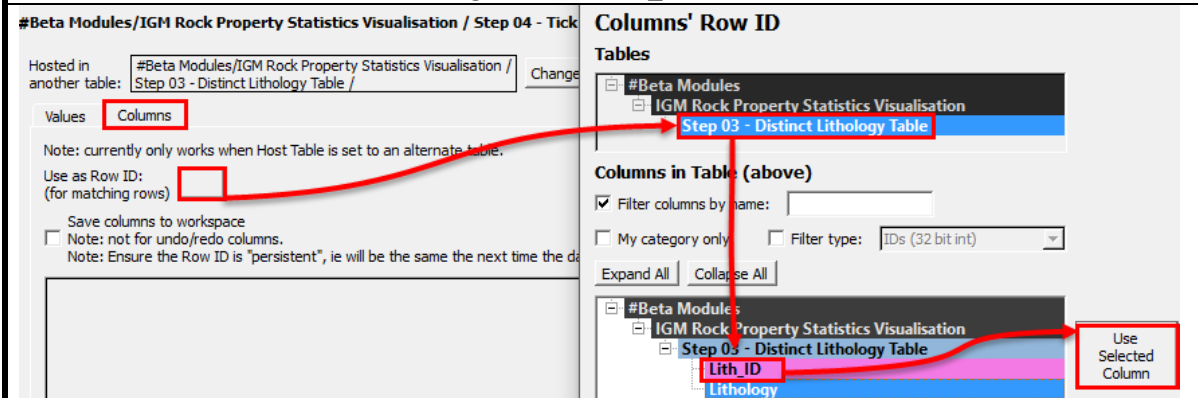


Left click on the *Columns* tab

Left click on the *Use as Row ID* button

Under the *Tables* tree, navigate to the *Distinct Lithology Table* created in Step 3

Under the *Columns in Table* tree, navigate to the *Lith_ID* column



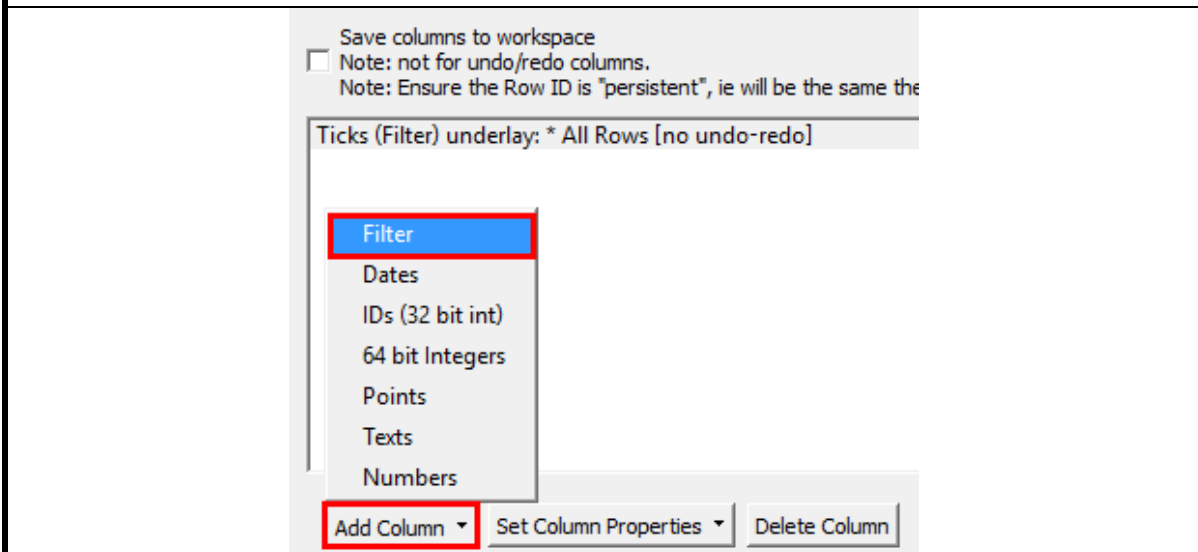
Left click on the *Add Column* button

In the **dropdown**, left click on *Filter*

When **prompted** for a filter name, name the filter “Ticks”

Right click on the newly created filter

- Left click *Select Underlay Column*
- In the *Underlay for Ticks popup*, under the *Tables tree*, navigate to the *Distinct Table*
- In the *Underlay for Ticks popup*, under the *Columns tree*, select “All Rows” at the top of the tree



Save the Tool

Analysis Step B Continued – Adding Ticks Variable to the Distinct Lithology Table

Open the Distinct Lithology Tableview

Step B - Distinct Lithology Tableview

#Beta Modules/IGM Rock Property Statistics Visualisation / Step B - Distinct Lithology Tableview

	Lithology
1	FAZ
2	MZ
3	NC1
4	NC2
5	PNZ
6	T1
7	T2L
8	T2U

Left click on the *Configure Page* button

In the *Configure page* popup:

- Left click on the *Columns Table* tab
- Left click on the *Tick column* button to toggle it
- Left click on the *Ticks* button
 - In the *Set Column to use for Ticks* popup, navigate to the *Ticks* column created in Step 4

column headers as: labels (default) column sources (debugging)

ts | Titles and Panel | Values Table | **Columns Table** | Appearance |

Configure #Beta Modules/IGM Rock Property Statistics Visualisation... ? X

Set Column to use for Ticks

Tables

- #Beta Modules
 - IGM Rock Property Statistics Visualisation
 - Step 03 - Distinct Lithology Table**

Columns in Table (above)

Filter columns by name:

My category only Filter type:

Expand All Collapse All

- All Rows
- * Home
- #Beta Modules
 - IGM Rock Property Statistics Visualisation
 - Step 04 - Tick Table (to be used for filtering on lithology)
 - Ticks**

Use Selected Column

Reset Column

Ticks

Tick column:

Tick value:

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 04 - Tick Table (to be used for filtering on lithology) / Ticks

The Tableview should look something like this

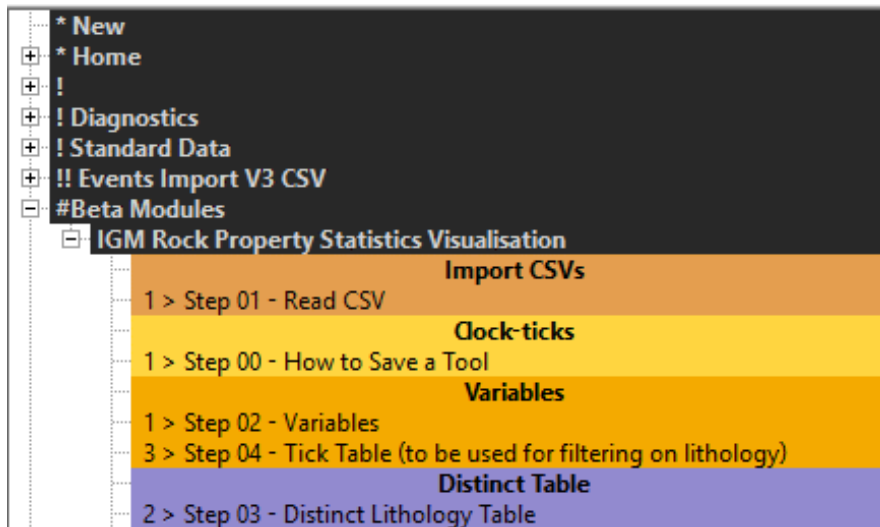
#Beta Modules/IGM Rock Property Statistics Visualisation ,

	Lithology
1	<input checked="" type="checkbox"/> FAZ
2	<input checked="" type="checkbox"/> MZ
3	<input checked="" type="checkbox"/> NC1
4	<input checked="" type="checkbox"/> NC2

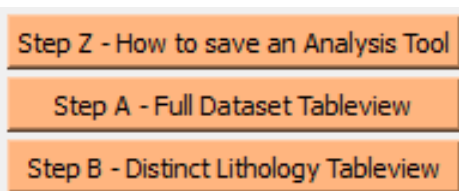
Left Click the *Configure Page* button and Save the Tool

Application Progress (Section 2)

The tool tree in the Settings Window should now look as follows. Following the naming convention will make it easier to follow the walkthrough steps.



A distinct table has now been created to show the types of lithology contained in the database. A ticks filter column has also been added. These changes are reflected in a newly created tableview.



In the next section, a table map will be used to map the values for the ticks column in the distinct table over to the CSV table.

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3. Linking the two tables using a Table Map

Settings Step 05 – Creating a Table Map from the CSV table to the Distinct Lith table

The aim of a table map is to compare selected columns in two tables (In this case, the csv table and the distinct Lithology table) and to perform an action once a comparative condition is met. In this case we’re assigning the ticks from the Distinct Lithology Table to the original CSV table.

Create and Save a new *Table Map tool
* Table Map

Save As

Folder: #Beta Modules/IGM Rock Property Statistics Visualisation
Name: Step 05 – Map Ticks (Distinct Lithology table to Complete table)

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 05 - Ma
 Star this tool

Configuration

Note: For value-based matches, use the Order column to specify match priority where there are Foreign rows with identical values

Value: Map first exact matches

Value: Map the last foreign row that is < primary

Value: Map the last foreign row that is <= primary

Value: Map the first foreign row that is > primary

Point: Map Link nearest item

Nearest Point Configuration

Maximum distance to search: Link

Map only one point (results generated in the Primary Table)

Map all of the N nearest points (results generated in a new table)

Generate a Row Id column named: Rename

Limit number of generated rows to: Link

If we exceed the maximum number of rows, report an error

Primary Table

Table :

Filter :

Group by (1) :

Group by (2) :

Values :

Locations :

Max radius to search

Mapped Primary Columns
(Only for "Map all" mode)

Id an ext

Foreign Table

Table :

Filter :

Group by (1) :

Group by (2) :

Values :

Order by :

Ascending

Locations :

Mapped Foreign Columns

Add an extra

Requires Tables and Filters

Revert to Saved
Delete

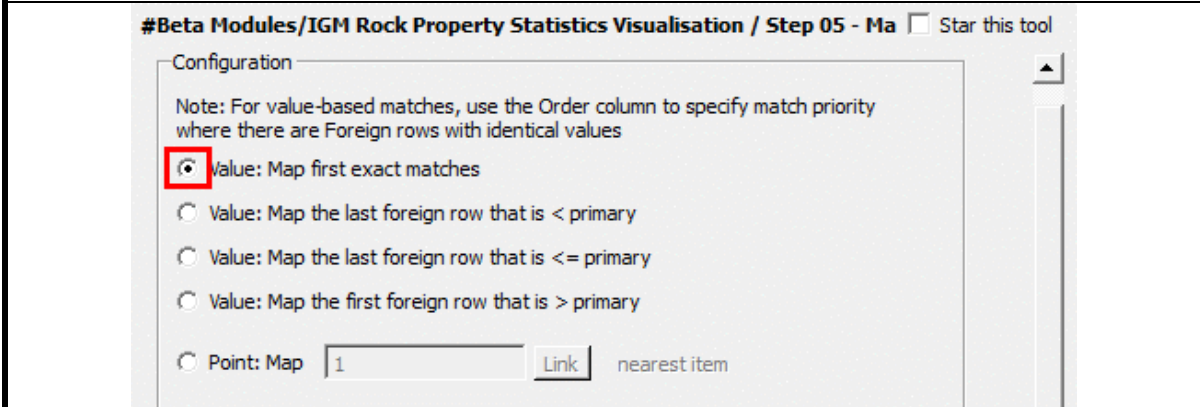
Save As
 Auto Apply

Clear Unused
Rename

Save
Apply

Left click to Toggle the *Map first exact matches* value

Note: The aim is to map the lithologies of the CSV table (Step 1) to the distinct table (Step 3), mapping only the first exact matches, adding a column for the Ticks filter created in Step 4.

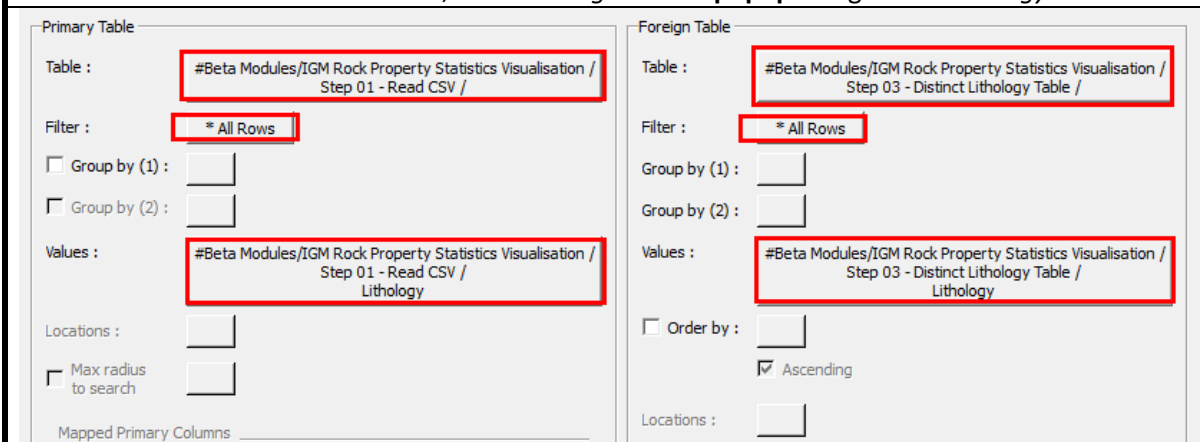


In the *Primary Table* section

- **Left click** the *Table* button, in the *Primary Table popup* navigate to the *Read CSV* table
- **Left click** the *Filter* button, in the *Primary Filter popup* navigate to **All Rows*
- **Left click** the *Values* button, in the *Primary Values popup* navigate to *Lithology*

In the *Foreign Table* section

- **Left click** the *Table* button, in the *Foreign Table popup* navigate to the *Distinct Lithology* table
- **Left click** the *Filter* button, in the *Foreign Filter popup* navigate to **All Rows*
- **Left click** the *Values* button, in the *Foreign Values popup* navigate to *Lithology*

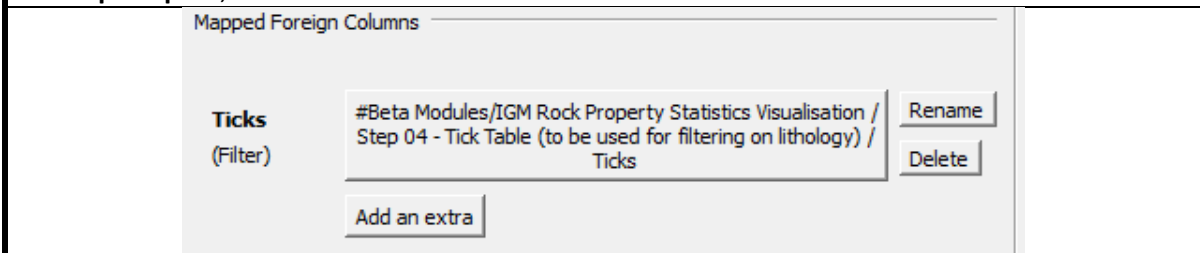


In the *Mapped Foreign Columns* section

Left click on the *Add an extra* button

In the *New Foreign Extra popup*, navigate to the *Ticks* column created in Step 04

When **prompted**, name the extra "Ticks"



Save the Tool

Analysis Step C – Creating a Table View showing which Lithologies are “Ticked”

Create and Save a new *Table View
Create * Table View

Save As *Folder: #Beta Modules/IGM Rock Property Statistics Visualisation*
Name: Step C – Complete Table with Ticks Tableview

Left click on the *Configure Page* button
 In the *Configure page popup*:

- **Left click** on the *Columns Table* tab
- **Left click** on the *Table* button
 - In the *Choose the Table to View popup*, navigate to the *Read CSV* table
- **Left click** on the *Filter* button
 - In the *Set the default Filter popup*, navigate to **All Rows*
- **Left click** on the *ID* button
 - In the *Set ID popup*, set the ID to *Read CSV*

In the *Columns Tree*, **tick** the *Lithology* column under *Read CSV* and the *Ticks* column under *Map Ticks*

Note: Ticking and unticking the various lithologies in the Distinct Lithology table will now show whether or not a row is included or excluded in the Complete Table just created.

Show row/column headers as: labels (default) column sources (debugging)

Comments | Titles and Panel | Values Table | **Columns Table** | Appearance

Show Columns table

Table: #Beta Modules/IGM Rock Property Statistics Visualisation Step 01 - Read CSV / Filter: Id: Beta Modules/IGM Rock Property Statistics Visualisation Step 01 - Read CSV /

Filter columns by name:
 My category only Filter type:

Show ticked items only

IGM Rock Property Statistics Visualisation

- Step 01 - Read CSV
 - CHID
 - Lithology**
 - Eq_RMR
 - From
 - To
- Step 03 - Distinct Lithology Table
- Step 05 - Map Ticks (Distinct Lithology table to Complete table)
 - Ticks**

Ticks

Tick column:

Tick value:

Marker Menu

Revert to Saved Delete Save As Save Apply Cancel

Clear Unused Rename

The Tableview should look something like this

#Beta Modules/IGM Rock Property Statistics Visualisation / Step C - Complete Table (ticks filtered) Tableview

	↓	Lithology	Ticks
1		FAZ	Included
2		FAZ	Included
3		FAZ	Included
4		FAZ	Included
5		FAZ	Included
6		FAZ	Included

Note: Changing the ticks column in the Distinct Lithology Table will now indicate whether or not a Lithology is included or not in the new table. The use of this will become apparent later on in the walkthrough. Effectively this will allow the user to toggle which lithologies are of interest.

#Beta Modules/IGM Rock Property Statistics Visualisation / Step B - Distinct Lithology Tableview -

	↓ Lithology
1	<input type="checkbox"/> FAZ
2	<input checked="" type="checkbox"/> MZ
3	<input checked="" type="checkbox"/> NC1
4	<input checked="" type="checkbox"/> NC2
5	<input checked="" type="checkbox"/> PNZ
6	<input checked="" type="checkbox"/> T1
7	<input checked="" type="checkbox"/> T2L
8	<input checked="" type="checkbox"/> T2U

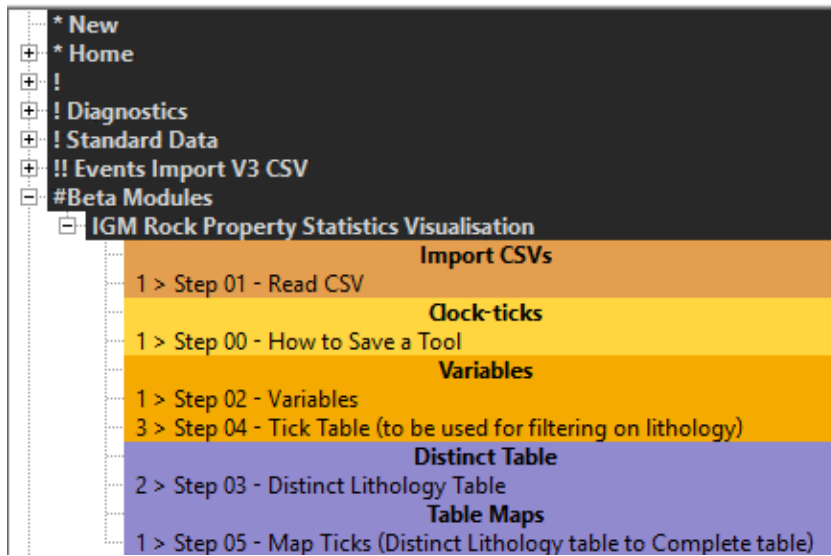
#Beta Modules/IGM Rock Property Statistics Visualisation / Step C - Complete Table (ticks filtered) Tableview -

	↓ Lithology	Ticks
558	FAZ	
559	FAZ	
560	FAZ	
561	FAZ	
562	FAZ	
563	FAZ	
564	MZ	Included
565	MZ	Included
566	MZ	Included
567	MZ	Included
568	MZ	Included

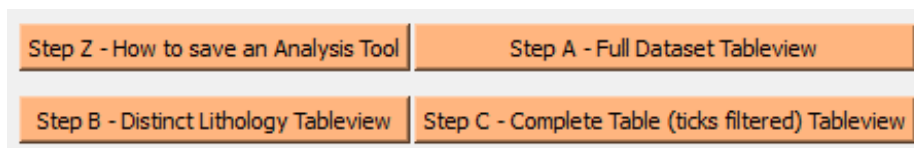
Left Click the Configure Page button and Save the Tool

Application Progress (Section 3)

The tool tree in the Settings Window should now look as follows. Following the naming convention will make it easier to follow the walkthrough steps.



The ticks variable has now been mapped over to from the Distinct Lithology Table to the Read CSV table using a table map. The influence of this has been demonstrated in a newly created tableview. It can be seen that changing the ticks in the Distinct Lithology Tableview changes the Ticks column values in the Complete Table (ticks filtered) Tableview.



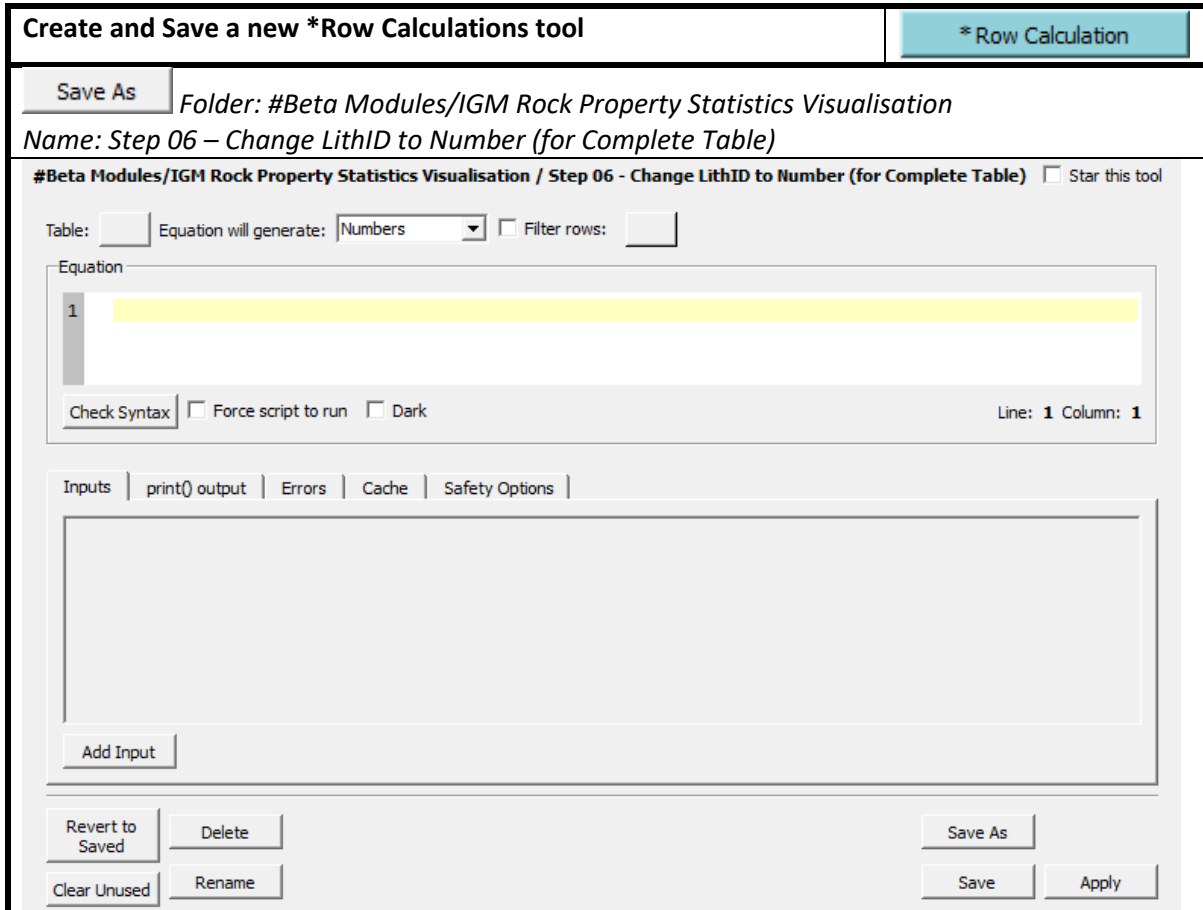
In the next section, basic row calculations and accumulations will be used to create a CDF chart for the Lithologies.

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4. Creating a CDF table and chart for the Lithologies

Settings Step 06 – Row calculations to return the LithID as a number for CSV table

This row calculation simply gives a unique ID for each of the Lithologies in the CSV table. This is done so we can order the CSV table using the numbers in the unique ID column.

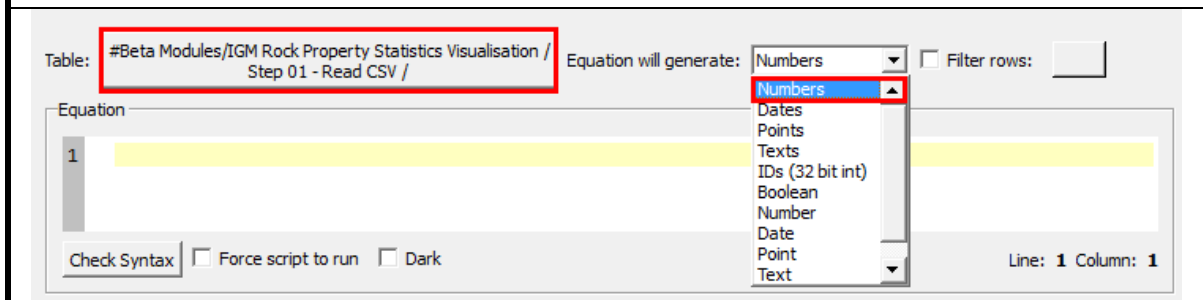


Left click on the *Table* button

In the *Table* **popup**, navigate to the Read CSV table

In the *Equation will generate* **dropdown**, select *Numbers*

Note: If the equation is set to generate a Number instead of Numbers, it will only generate a single value. In this case, the desired outcome is the conversion of each Lith_ID as a number instead of an ID.

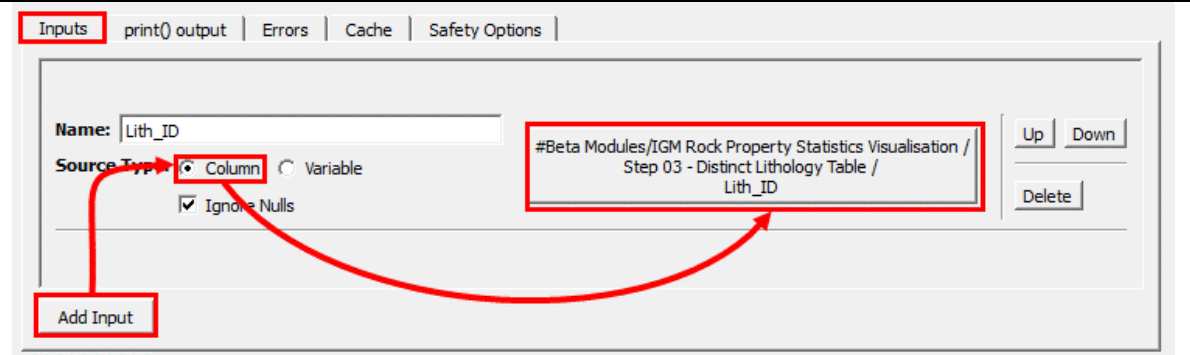


Left click on the *Inputs* tab to open it

Left click on the *Add Input* button

Left click on the *Column* toggle to select it

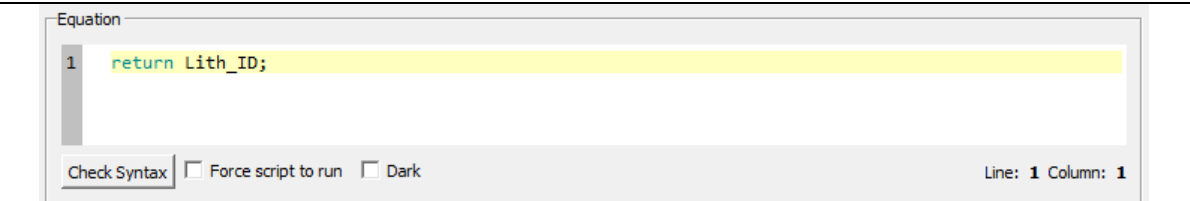
Left click on the *Source* button, in the *Choose Column for popup*, navigate to the *Lith_ID* Type in the *Name* of the input as “*Lith_ID*”



In the *Equation* box, **type** the following code:

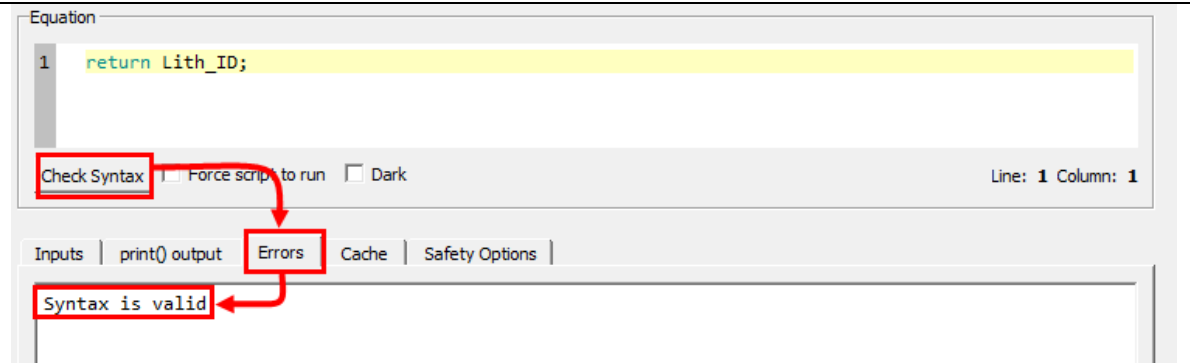
Return Lith_ID;

Note: Recall the Input Name set earlier was Lith_ID. What this calculation does, is call up the Lith_ID column for each row of the Read CSV table. The input is read in as an ID, and then returned as a number.



To check that the Syntax of the code is correct, **left click** the *Check Syntax* button

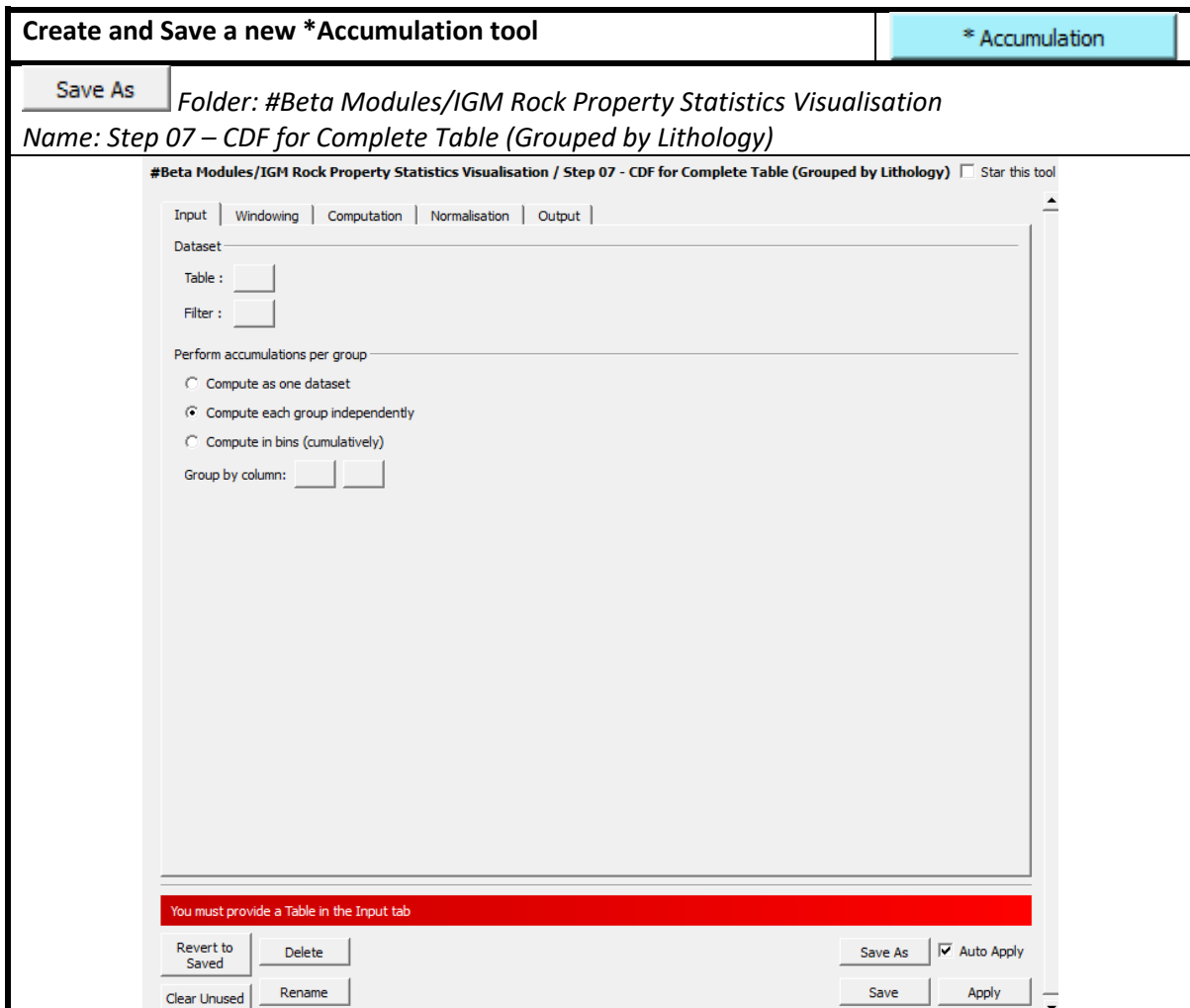
This will open the *Errors* tab and show whether or not the Syntax is valid



Save the Tool

Settings Step 07 – Using an Accumulation tool to create a CDF table sorted per lithology

This accumulation will count the RMR values for each lithology.



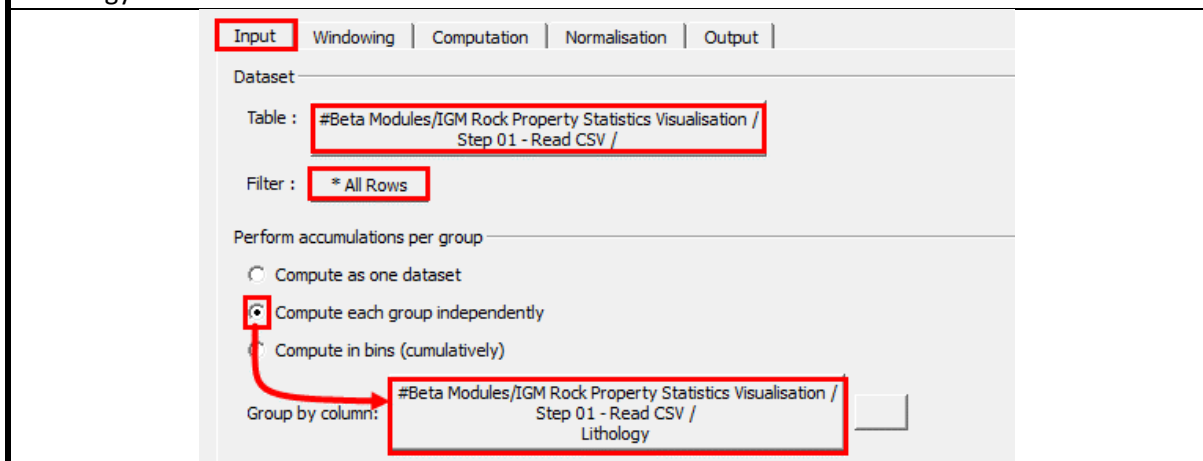
Left click on the *Input* tab to open it

Left click on the *Table* button. In the *Table popup*, navigate to the Read CSV table

Left click on the *Filter* button. In the *Filter popup*, navigate to *All Rows

Left click to toggle the *Compute each group independently* value

Left click on the *Group by column* button. In the *Group first by Column popup*, navigate to the Lithology column



Left click on the *Computation* tab to open it

Left click on the *Order by column* button. In the *Order by column* popup, navigate to the Eq_RMR column

Tick the *Count* box under the *Simple Computations* section

Left click on the *Perform Accumulations On* button. In the *Values* popup, navigate to Eq_RMR

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 07 - CDF for Complete Table (Grouped by Lithology) Star this tool

Input | Windowing | **Computation** | Normalisation | Output |

Order the data before doing the accumulation

Order by column: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Eq_RMR

Ascending Descending

Simple Computations

Count ignore nulls (requires input in next section)

Input-based Computations

Perform accumulations on: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Eq_RMR
Note: ignores null values

Left click on the *Normalisation* tab to open it

Left click on the *Divide by total number of elements in group* option to toggle it

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 07 - CDF for Complete Table (Grouped by Lithology)

Input | Windowing | Computation | **Normalisation** | Output |

No normalisation

Divide by total number of elements in group

Divide by total number of elements in dataset (all rows that passed the filter)

Divide by current number of elements in running window size

Left click on the *Output* tab to open it

Tick the *Generate progressive results for the input table* box

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 07 - CDF for Complete Table (Grouped by Lithology)

Input | Windowing | Computation | Normalisation | **Output** |

Progressive Results

Generate progressive results for the input table

Save the Tool

Settings Step 08 – Row calculations to return LithID as a number for Distinct Lith table

Similarly, to the previously built Row Calculation, this Row Calculation will give an ID to each lithology however this time in the Distinct Lithology Table.

Create and Save a new *Row Calculations tool
* Row Calculation

Save As
Folder: #Beta Modules/IGM Rock Property Statistics Visualisation
Name: Step 08 – Change LithID to Number (for Distinct Table)

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 08 - Change LithID to Number (for Distinct Table)
 Star this tool

Table:
Equation will generate: Numbers
 Filter rows:

1

Force script to run
 Dark
Line: 1 Column: 1

Inputs
print() output
Errors
Cache
Safety Options

Left click on the *Table* button

In the *Table popup*, navigate to the Distinct Lithology Table

In the *Equation will generate dropdown*, select *Numbers*

Note: If the equation is set to generate a Number instead of Numbers, it will only generate a single value.

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 08 - Change LithID to Number (for Distinct Table)
 Star this tool

Table: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology Table /
Equation will generate: Numbers
 Filter rows:

1

Force script to run
 Dark
Line: 1 Column: 1

Inputs
print() output
Errors
Cache
Safety Options

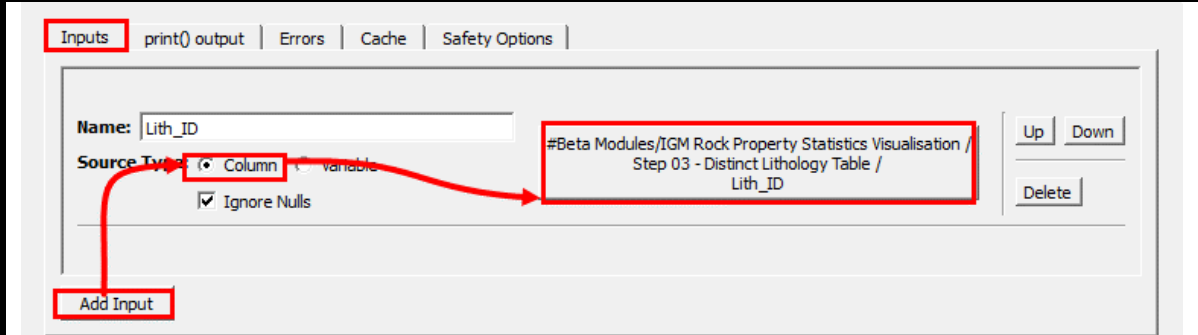
Left click on the *Inputs* tab to open it

Left click on the *Add Input* button

Left click on the *Column* toggle to select it

Left click on the *Source* button, in the *Choose Column for popup*, navigate to the *Lith_ID*

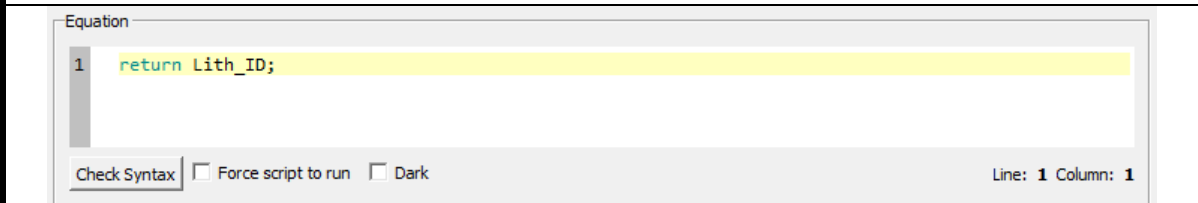
Type in the *Name* of the input as “*Lith_ID*”



In the *Equation* box, type the following code:

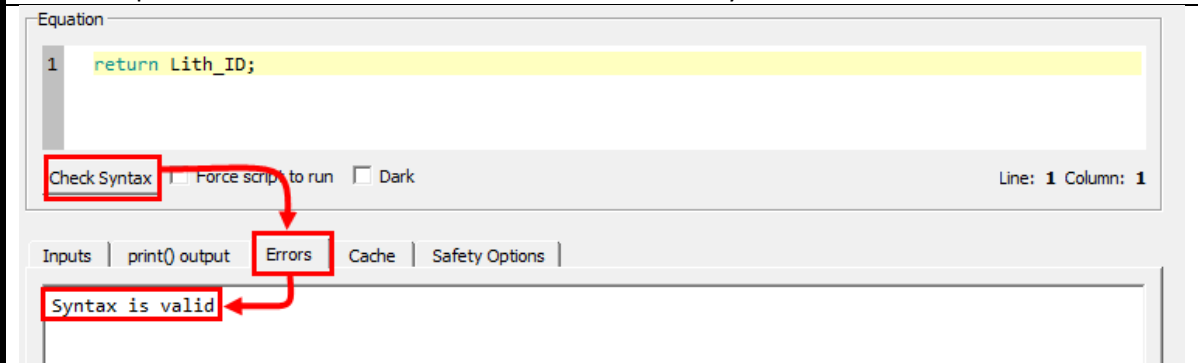
Return Lith_ID;

Note: Recall the Input Name set earlier was Lith_ID. What this calculation does, is call up the Lith_ID column for each row of the Read CSV table. The input is read in as an ID, and then returned as a number.



To check that the Syntax of the code is correct, left click the *Check Syntax* button

This will open the *Errors* tab and show whether or not the Syntax is valid



Save the Tool

Settings Step 09 – Accumulations tool to Number the Lithologies in the Distinct Table

This accumulation counts the number of entries under each lithology.

Create and Save a new *Accumulation tool
* Accumulation

Save As

Folder: #Beta Modules/IGM Rock Property Statistics Visualisation

Name: Step 09 – Count Number of Lithologies (with Min and Max)

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 09 - Count Number of Lithologies (with Min and Max) Star this t

Input | Windowing | Computation | Normalisation | Output

Dataset

Table :

Filter :

Perform accumulations per group

Compute as one dataset

Compute each group independently

Compute in bins (cumulatively)

Group by column:

You must provide a Table in the Input tab

Revert to Saved

Delete

Save As

Auto Apply

Clear Unused

Rename

Save

Apply

Left click on the *Input* tab to open it

Left click on the *Table* button. In the *Table popup*, navigate to the Distinct Lithology table

Left click on the *Filter* button. In the *Filter popup*, navigate to *All Rows

Left click to toggle the *Compute as one dataset* value

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 09 - Count Number of Lithologies

Input | Windowing | Computation | Normalisation | Output

Dataset

Table : #Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology Table /

Filter : * All Rows

Perform accumulations per group

Compute as one dataset

Compute each group independently

Compute in bins (cumulatively)

Group by column:

- Left click** on the *Computation* tab to open it
- Left click** on the *Order by column* button. In the *Order by column* **popup**, navigate to the Change LithID to Number row calculation output column from Step 08
- Tick** the *Count* box under the *Simple Computations* section
- Left click** on the *Perform Accumulations On* button. In the *Values* **popup**, navigate again to the output from the row calculation in Step 08 (LithID to Number)
- Tick** the *Minimum* and *Maximum* boxes

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 09 - Count Number of Lithologies (with Min and Max) Star this tool

Input | Windowing | **Computation** | Normalisation | Output

Order the data before doing the accumulation

Order by column: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 08 - Change LithID to Number (for Distinct Table) /

Ascending Descending

Simple Computations

Count ignore nulls (requires input in next section)

Input-based Computations

Perform accumulations on: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 08 - Change LithID to Number (for Distinct Table) /

Note: ignores null values

Sum

Average (arithmetic mean)

Geometric mean (note: only processes values > 0)

Minimum

Maximum

Standard Deviation

Median (50th percentile)

Percentile 90 %

Difference between first and last of window

- Left click** on the *Output* tab to open it
- Tick** the *Export final results to another table* box
- Left click** on the *Table* button, in the *Export Table* **popup**, navigate to the Distinct Lithology Table

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 09 - Count Number of Lithologies

Input | Windowing | Computation | Normalisation | **Output**

Progressive Results

Generate progressive results for the input table

Final Results

Export final results to another table:

Input is not grouped, so the output will be a Single Values published in the specified Table.

Table: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology Table /

Column to Match with Group Column:

Save the Tool

Analysis Step D – Creating a CDF chart for All Lithologies

Create and Save a new *Chart
Create * Chart

Save As
Folder: #Beta Modules/IGM Rock Property Statistics Visualisation
Name: Step D – CDF per Lithology Chart

Left click on the *Configure Page* button

In the *Configure page popup*:

- Left click** on the *Series* tab
- Left click** on the *Add* button
- In the *Series Name* text box, give the series an appropriate name

Comments |
 Titles and Panel |
 Series |
 Axes |
 Appearance

CDF - ALL

Series Name: CDF - ALL

Series Icon: Copy Hard-Space

Data |
 Markers |
 Advanced |
 Comments

Table :

Filter :

Id :

X : Bottom

Y : Left

Multiple Lines

Group by :

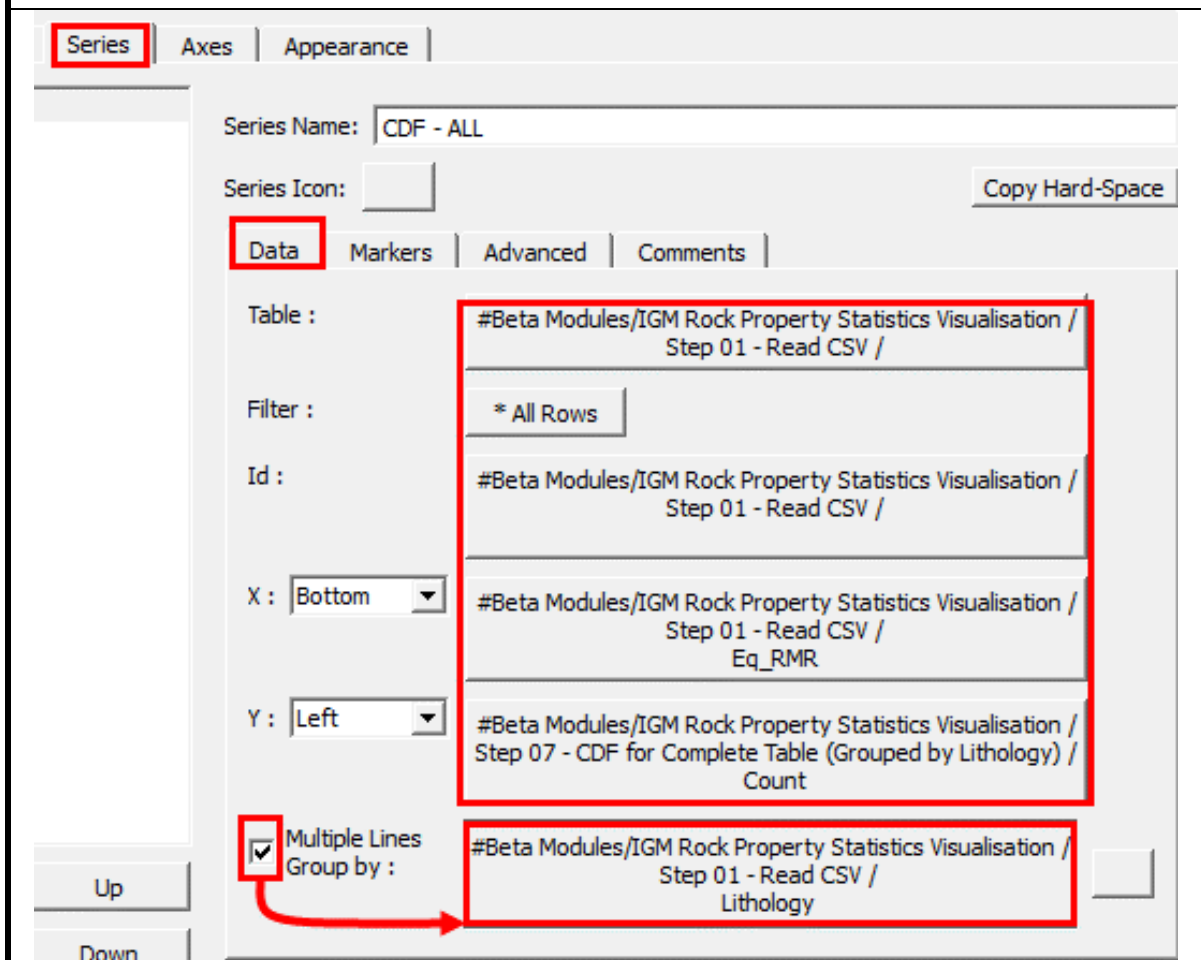
Add Up
Remove Down

Revert to Saved Delete Save As

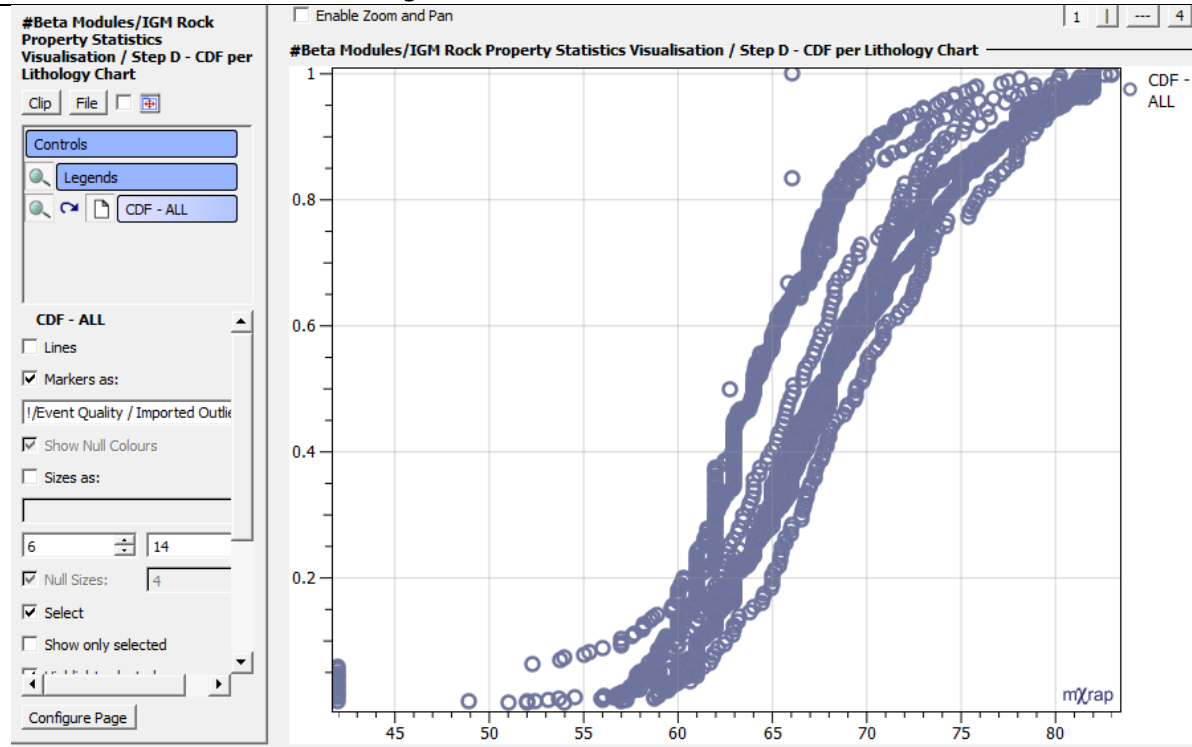
Clear Unused Rename Save Apply Cancel

Left click on the *Data* tab to open it

- **Left click** on the *Table* button
 - In the *Table popup*, navigate to the Read CSV table
- **Left click** on the *Filter* button
 - In the *Filter popup*, navigate to *All Rows
- **Left click** on the *ID* button
 - In the *Set ID popup*, set the ID to Read CSV
- **Left click** on the *X* button
 - In the *X popup*, set the X-Values to the Eq-RMR for the Read CSV table
- **Left click** on the *Y* button
 - In the *Y popup*, set the Y-Values to the Count for CDF for accumulation created in step 07
- **Tick** the *Multiple Lines Group By* box
- **Left click** on the *Multiple Lines Group By* button
 - In the *Group (1) popup*, set the Group to the Lithology under the Read CSV

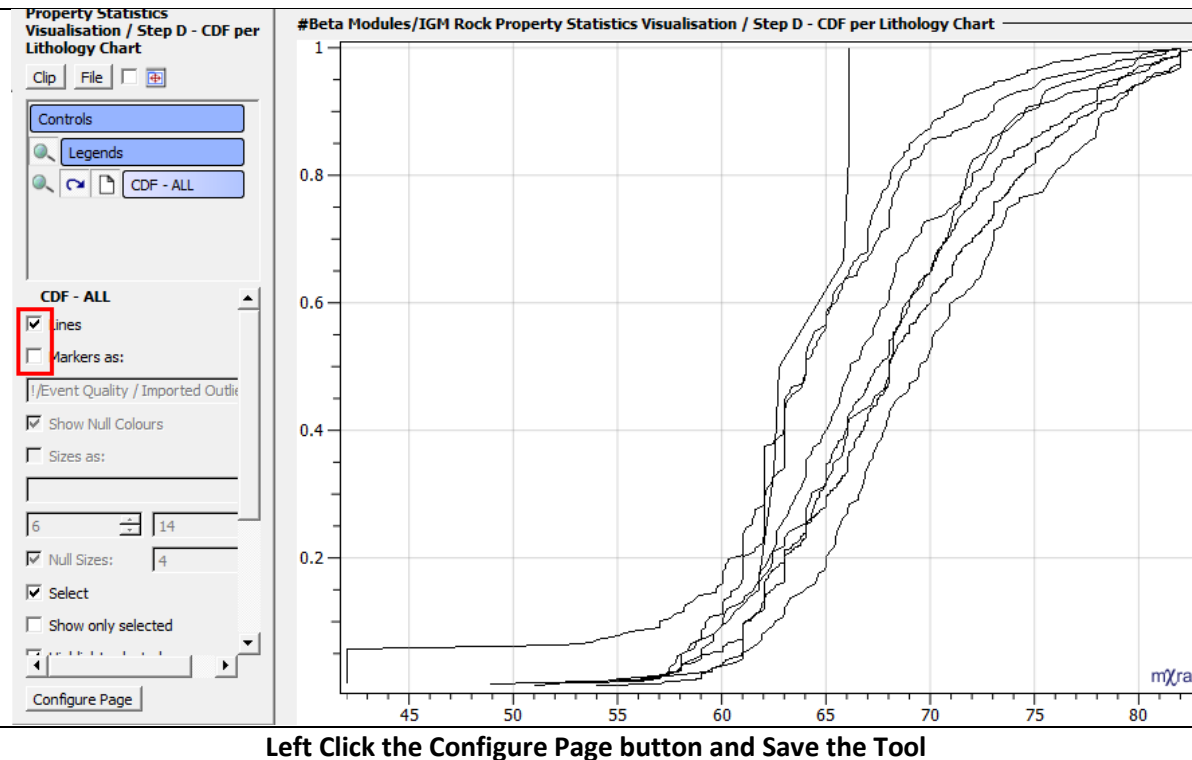


The Charts should look something like this



Tick the *Lines* box to show the distribution as lines and **untick** the *Marker as* box to remove the marker dots

The Chart will now look like this



Left Click the **Configure Page** button and Save the Tool

Analysis Step E – Creating a CDF chart for the Ticked Lithologies

Create and Save a new *Chart**Create * Chart**

Save AsFolder: #Beta Modules/IGM Rock Property Statistics Visualisation
Name: Step E – CDF per Lithology (ticks filtered) Chart

Left click on the *Configure Page* button
In the *Configure page popup*:

- **Left click** on the *Series* tab
- **Left click** on the *Add* button
- In the *Series Name* text box, give the series an appropriate name

Comments | Titles and Panel | **Series** | Axes | Appearance

CDF - Ticks

AddUp

RemoveDown

Series Name: CDF - Ticks

Series Icon: Copy Hard-Space

Data | Markers | **Advanced** | Comments

Table :

Filter :

Id :

X : Bottom

Y : Left

Multiple Lines
Group by :

Revert to SavedDelete

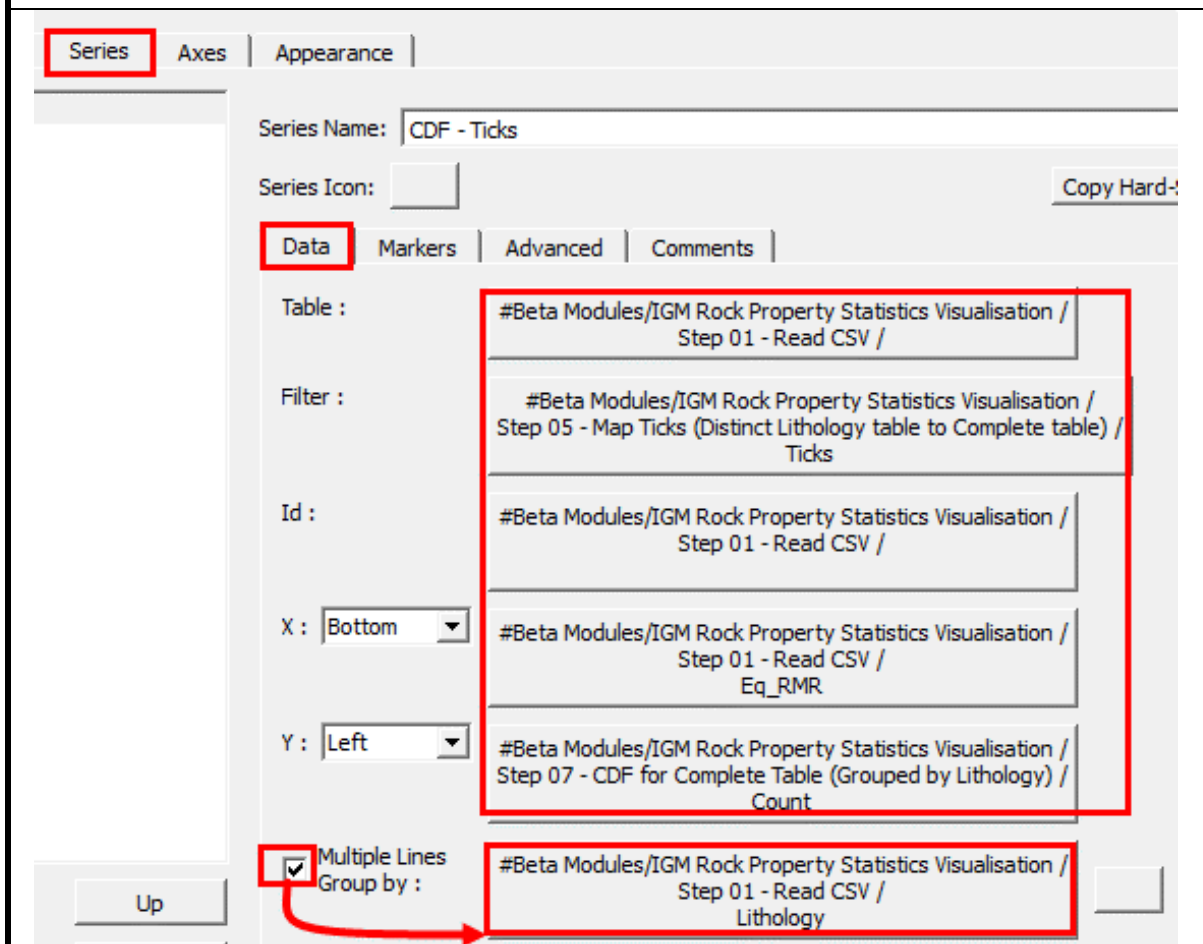
Save As

Clear UnusedRename

Save**Apply****Cancel**

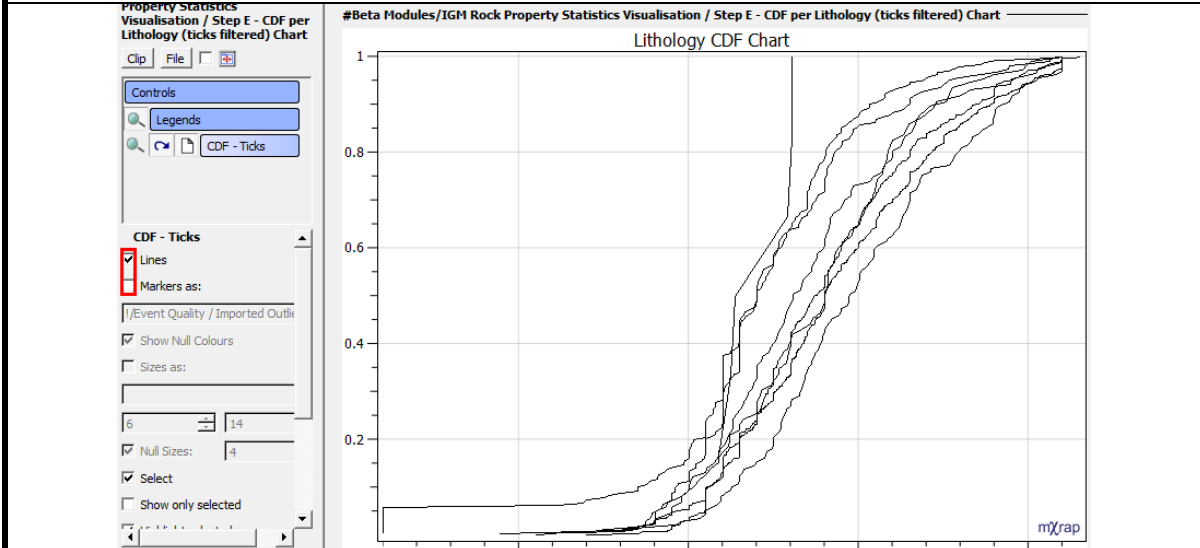
Left click on the *Data* tab to open it

- **Left click** on the *Table* button
 - In the *Table popup*, navigate to the Read CSV table
- **Left click** on the *Filter* button
 - In the *Filter popup*, navigate to Ticks filter under the table map created in Step 05
- **Left click** on the *ID* button
 - In the *Set ID popup*, set the ID to Read CSV
- **Left click** on the *X* button
 - In the *X popup*, set the X-Values to the Eq-RMR for the Read CSV table
- **Left click** on the *Y* button
 - In the *Y popup*, set the Y-Values to the Count for CDF for accumulation created in step 07
- **Tick** the *Multiple Lines Group By* box
- **Left click** on the *Multiple Lines Group By* button
 - In the *Group (1) popup*, set the Group to the Lithology under the Read CSV

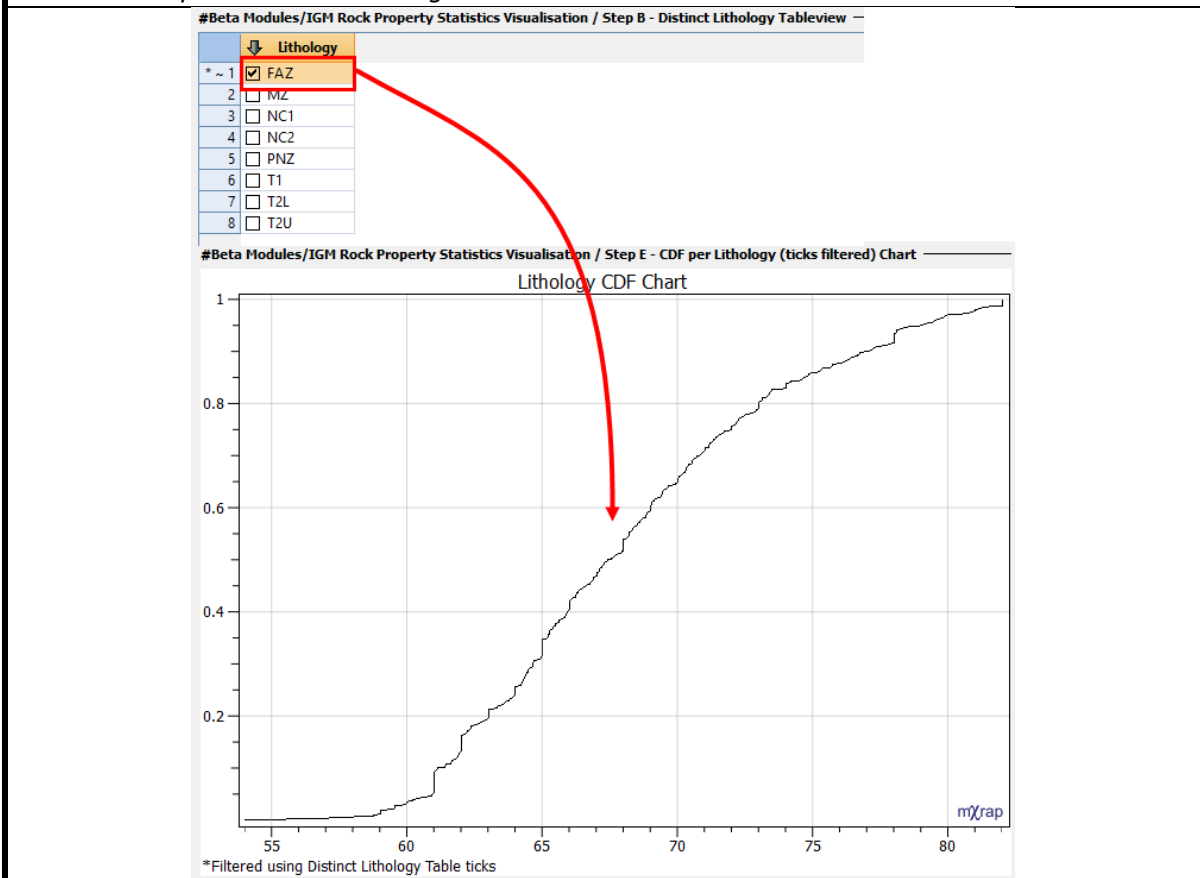


As before, **tick** the *Lines* box and **untick** the *Marker as* box to get the distribution in line form
The chart will look like this

*Note: The Titles and Panel tab and the Axes tab in the Configure Page **popup** can be used to give the chart a title as well as naming the axes.*



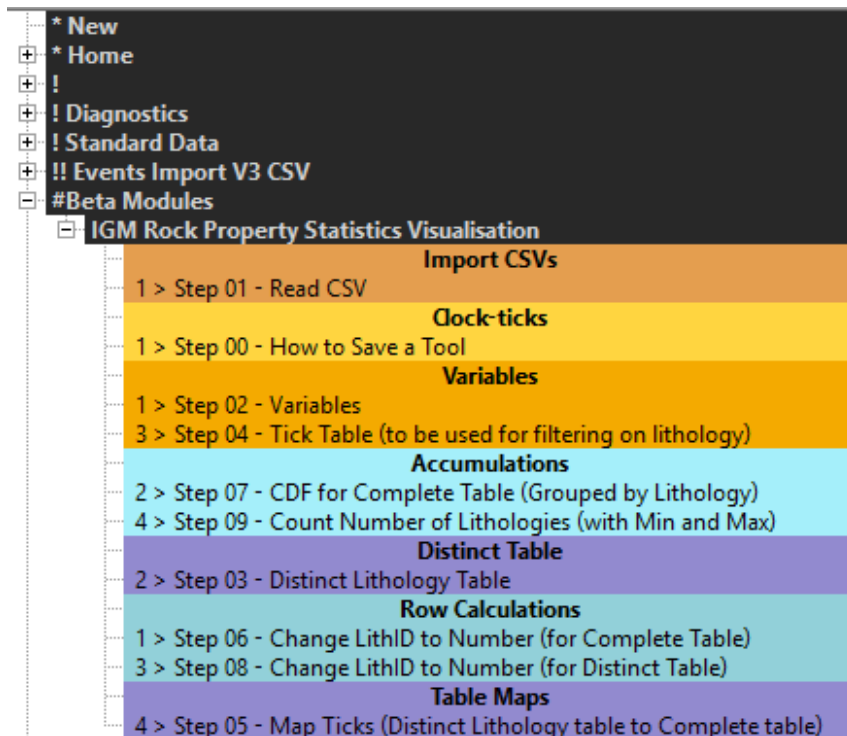
Note: Ticking the Lithologies in the Distinct Lithology Table will now change which of the Lithologies are shown in the Chart. Later, Markers will be added to allow easier differentiation of which lines represent which lithologies



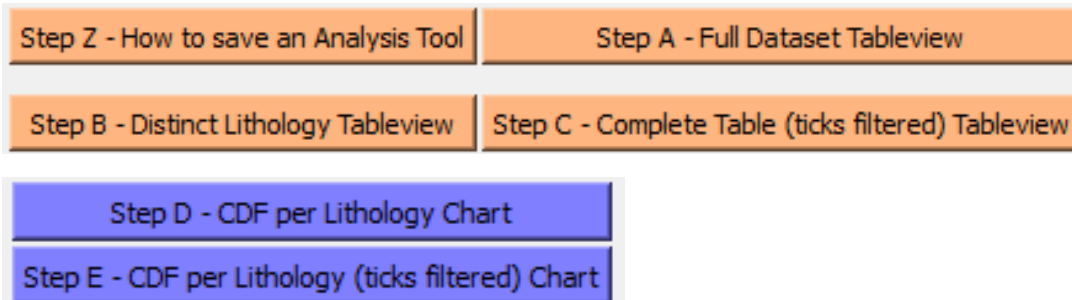
Left Click the Configure Page button and Save the Tool

Application Progress (Section 4)

The tool tree in the Settings Window should now look as follows. Following the naming convention will make it easier to follow the walkthrough steps.



A CDF plot for the Lithologies has been drawn using a combination of row calculations and accumulations. Two new charts have been created, one of which has the added functionality of being filtered by the ticks column in the Distinct Lithology Table.



In the next section, key statistical values for each lithology will be determined and displayed in a tableview.

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5. Calculating the Statistics per Lithology

Settings Step 10 – Accumulating the statistics for each lithology

The following accumulation determines key statistics for each of the lithologies.

Create and Save a new *Accumulation tool
* Accumulation

Save As
Folder: #Beta Modules/IGM Rock Property Statistics Visualisation
Name: Step 10 – Count Number of Lithologies (with Min and Max)

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 10 - Statistics per Lithology
 Star this tool

Input
Windowing
Computation
Normalisation
Output

Dataset

Table :

Filter :

Perform accumulations per group

Compute as one dataset

 Compute each group independently

 Compute in bins (cumulatively)

Group by column:

You must provide a Table in the Input tab

Revert to Saved
Delete

Save As
 Auto Apply

Clear Unused
Rename

Save
Apply

Left click on the *Input* tab to open it

Left click on the *Table* button. In the *Table popup*, navigate to the Read CSV table

Left click on the *Filter* button. In the *Filter popup*, navigate to *All Rows

Left click to toggle the *Compute each group independently* value

Left click on the *Group by column* button. In the *Group first by Column popup*, navigate to the Lithology column

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 10 - Statistics per Lithology

Input
Windowing
Computation
Normalisation
Output

Dataset

Table : #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV /

Filter : * All Rows

Perform accumulations per group

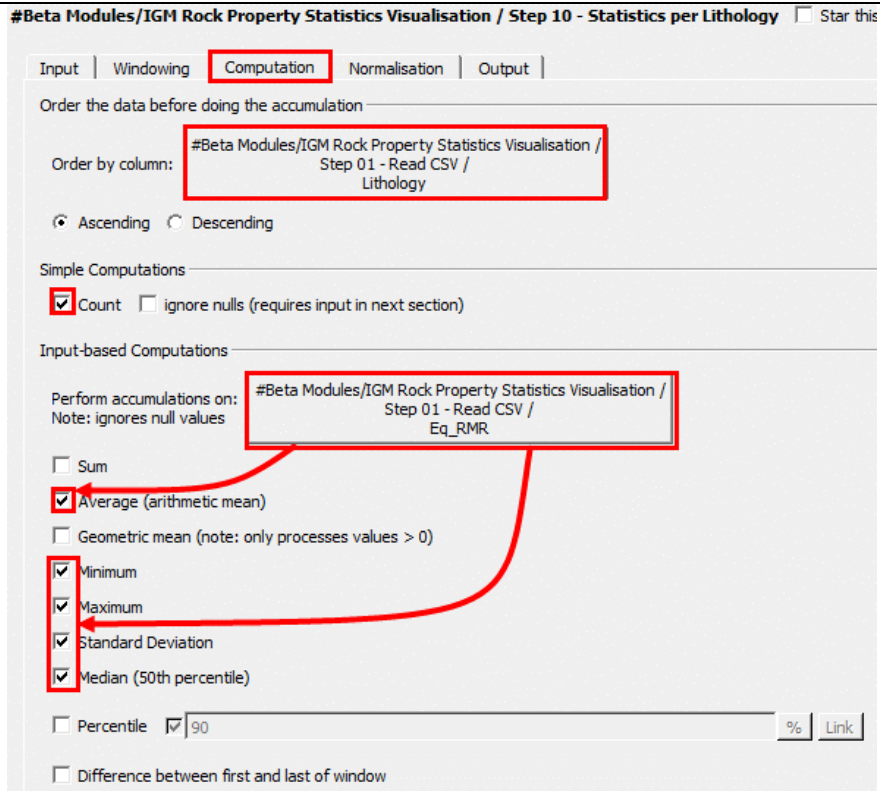
Compute as one dataset

 Compute each group independently

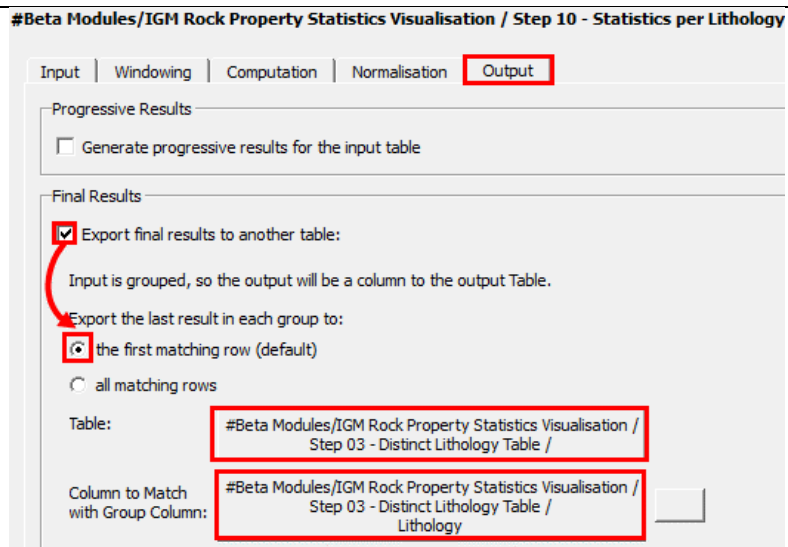
 Compute in bins (cumulatively)

Group by column: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Lithology

- Left click on the *Computation* tab to open it
- Left click on the *Order by column* button. In the *Order by column* popup, navigate to Lithology
- Tick the *Count* box under the *Simple Computations* section
- Left click on the *Perform Accumulations On* button. In the *Values* popup, navigate to Eq_RMR
- Tick the *Average, Minimum, Maximum, Standard Deviation* and *Median* boxes



- Left click on the *Output* tab to open it
- Tick the *Export final results to another table* box
- Left click on the *Table* button, in the *Export Table* popup, navigate to the Distinct Lithology Table
- Left click on the *Column to Match* button, in the *Export Group* popup, navigate to the Lithology column



Save the Tool

Analysis Step F – Creating a Table View for the Statistics per Lithology

Create and Save a new *Table View
Create * Table View

Save As *Folder: #Beta Modules/IGM Rock Property Statistics Visualisation*
Name: Step F – Statistics per Lithology Tableview

Left click on the *Configure Page* button
 In the *Configure page popup*:

- **Left click** on the *Columns Table* tab
- **Left click** on the *Table* button
 - In the *Choose the Table to View popup*, navigate to the *Distinct Lithology Table*
- **Left click** on the *Filter* button
 - In the *Set the default Filter popup*, navigate to **All Rows*
- **Left click** on the *ID* button
 - In the *Set ID popup*, set the ID to *Lith_ID*

In the *Columns Tree*

- **Tick** the *Lithology* column under the *Distinct Lithology Table*
- **Tick** all the *Statistics* columns created in *Step 10*

Show row/column headers as: labels (default) column sources (debugging)

Comments | Titles and Panel | Values Table | **Columns Table** | Appearance

Show Columns table

Table: Beta Modules/IGM Rock Property Statistics Visualisation
Step 03 - Distinct Lithology Table /
Filter:
Id: Beta Modules/IGM Rock Property Statistics Visualisation
Step 03 - Distinct Lithology Table /
Lith_ID

Filter columns by name:

My category only Filter type:

Show ticked items only

- All Rows
- * Home
- #Beta Modules
 - IGM Rock Property Statistics Visualisation
 - Step 03 - Distinct Lithology Table
 - Lith_ID
 - Lithology**
 - Step 04 - Tick Table (to be used for filtering on lithology)
 - Step 08 - Change LithID to Number (for Distinct Table)
 - Step 10 - Statistics per Lithology
 - Count**
 - Maximum**
 - Mean**
 - Median**
 - Minimum**
 - Std Dev**

Ticks

Tick column:

Tick value:

Marker Menu

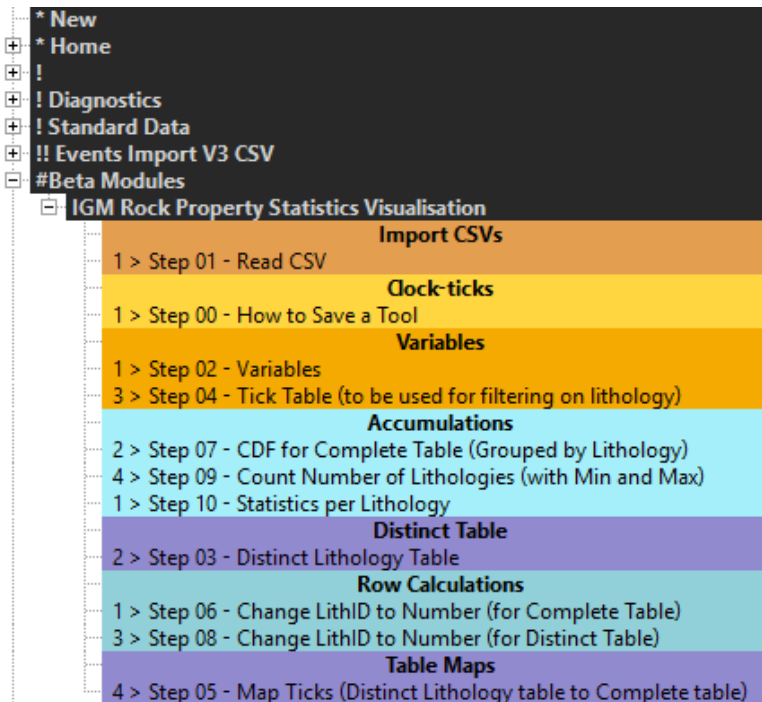
The Tableview should look something like this

#Beta Modules/IGM Rock Property Statistics Visualisation / Step F - Statistics per Lithology Tableview -							
	↓ Lithology	Count	Maximum	Mean	Median	Minimum	Std Dev
* 1	FAZ	563	82	68.1929	67.4157	54	5.6621
2	MZ	850	83	68.7896	68	51.015	6.20261
3	NC1	137	82	70.0948	69.465	55.93	5.94919
4	NC2	6	66.091	64.1683	64.285	61.769	1.85303
5	PNZ	205	82	63.9555	64	42	7.64134
6	T1	241	82	64.8233	64	48.903	4.65614
7	T2L	86	82	67.857	68.038	56.113	5.71468
8	T2U	107	82	66.9825	66.14	54.566	5.64195

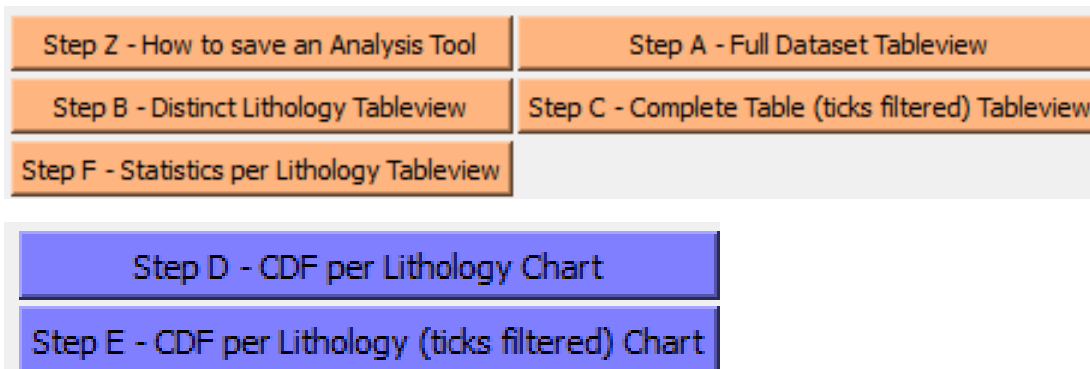
Left Click the Configure Page button and Save the Tool

Application Progress (Section 5)

The tool tree in the Settings Window should now look as follows. Following the naming convention will make it easier to follow the walkthrough steps.



Key statistical values for each lithology has been determined using an accumulation tool. The statistical values for each lithology can be seen in a newly created Statistics per Lithology Tableview



In the next section, a PDF distribution for each lithology will be obtained and displayed by means of charts.

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6. Creating PDF charts for the Lithologies

Settings Step 11 – Creating a Row Calculation to sort RMR data into bins

The goal of this Row Calculation is to sort the RMR values into bins. Each bin is characterised by the lithology it represents and therefore contains RMR values that particular lithology only.

Create and Save a new *Row Calculations tool
* Row Calculation

Save As
Folder: #Beta Modules/IGM Rock Property Statistics Visualisation

Name: Step 11 – EQ_RMR Bins

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins Star this tool

Table: Equation will generate: Numbers Filter rows:

Equation

1

Force script to run
 Dark
 Line: 1 Column: 1

Inputs
print() output
Errors
Cache
Safety Options

Left click on the *Table* button

In the **Table popup**, navigate to the Read CSV table

In the *Equation will generate dropdown*, select **Numbers**

Note: If the equation is set to generate a Number instead of Numbers, it will only generate a single value.

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins Star th

Table: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Equation will generate: Numbers Filter rows:

Equation

1

Inputs
print() output
Errors
Cache
Safety Options

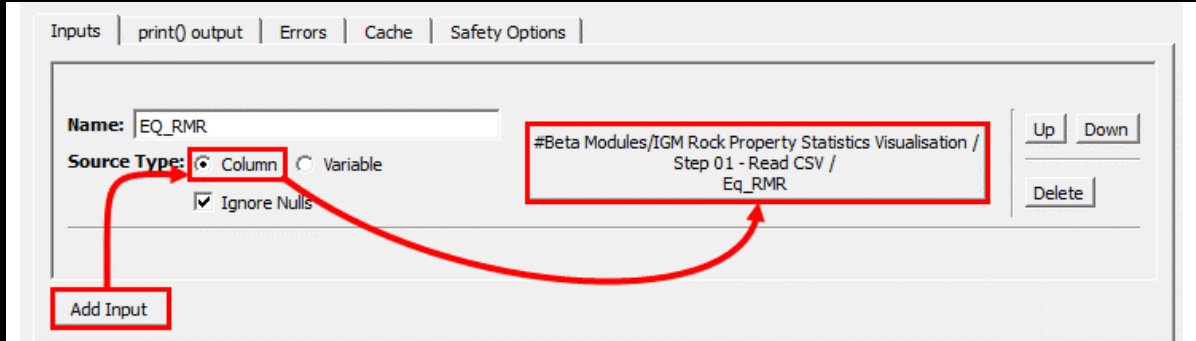
Left click on the *Inputs* tab to open it

Left click on the *Add Input* button

Left click on the *Column* toggle to select it

Left click on the *Source* button, in the *Choose Column for popup*, navigate to the *Eq_RMR*

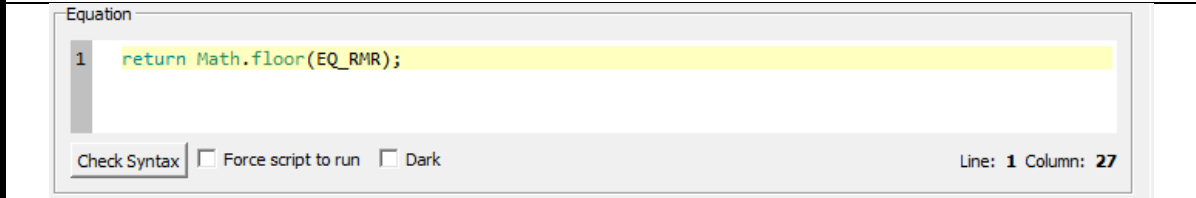
Type in the *Name* of the input as “EQ_RMR”



In the *Equation* box, type the following code:

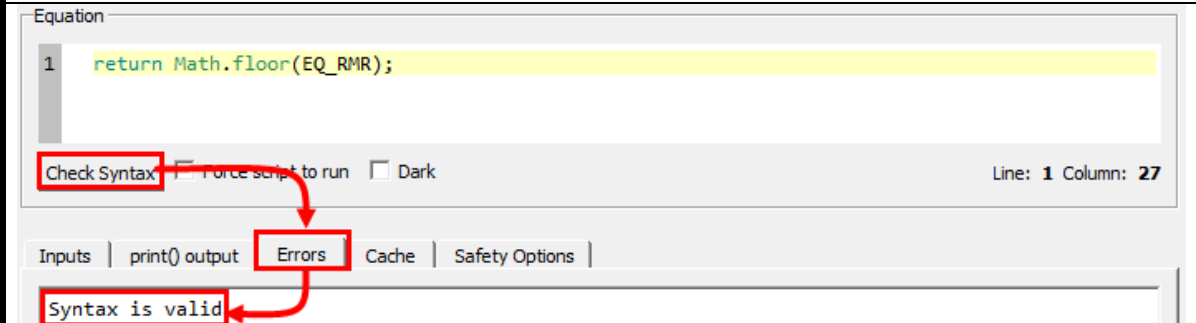
Return `Math.floor(EQ_RMR);`

Note: The `Math.floor()` function returns the largest integer less than or equal to a given number.



To check that the Syntax of the code is correct, left click the *Check Syntax* button

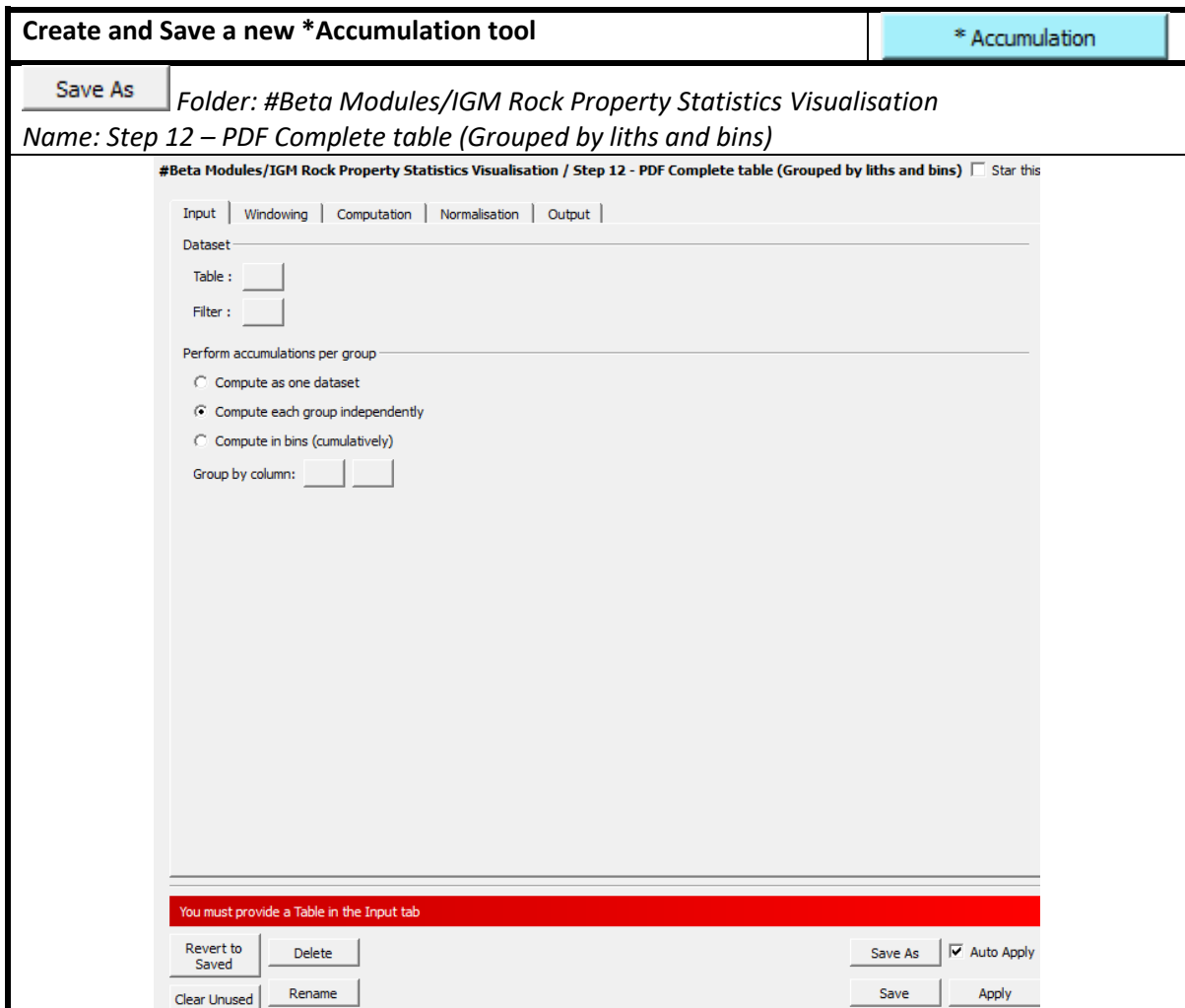
This will open the *Errors* tab and show whether or not the Syntax is valid



Save the Tool

Settings Step 12 – Accumulations tool created for the PDF of the RMR values

This accumulation will count the values for RMR grouping the values by bins as well.



Left click on the *Input* tab to open it

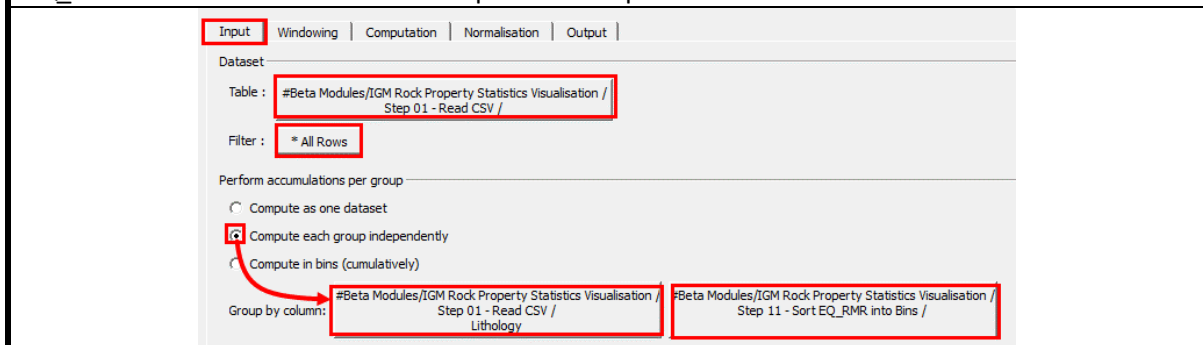
Left click on the *Table* button. In the *Table popup*, navigate to the Read CSV table

Left click on the *Filter* button. In the *Filter popup*, navigate to *All Rows

Left click to toggle the *Compute each group independently* value

Left click on the *Group by column* button. In the *Group first by Column popup*, navigate to the Lithology column

Left click on the other *Group by column* button. In the *Group second by Column popup*, Sort EQ_RMR into Bins row calculation output from Step 11



Left click on the *Computation* tab to open it

Left click on the *Order by column* button. In the *Order by column popup*, navigate to the Eq_RMR column

Tick the *Count* box under the *Simple Computations* section

Left click on the *Perform Accumulations On* button. In the *Values popup*, navigate to Eq_RMR

Input | Windowing | **Computation** | Normalisation | Output |

Order the data before doing the accumulation

Order by column: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Eq_RMR

Ascending Descending

Simple Computations

Count ignore nulls (requires input in next section)

Input-based Computations

Perform accumulations on: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Eq_RMR
Note: ignores null values

Left click on the *Output* tab to open it

Tick the *Generate progressive results for the input table* box

Input | Windowing | Computation | Normalisation | **Output**

Progressive Results

Generate progressive results for the input table

Save the Tool

Settings Step 13 – Creating an offset for the PDF chart using Row Calculations

This row calculation will offset the bars on the PDF chart which will increase the ease of visualisation.

Create and Save a new *Row Calculations tool
* Row Calculation

Save As
Folder: #Beta Modules/IGM Rock Property Statistics Visualisation
Name: Step 13 – EQ_RMR Bins (+ lith offset)

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 13 - EQ_RMR Bins (+ lith offset) Star this tool

Table:
Equation will generate: Numbers
 Filter rows:

Equation

1

Check Syntax
Force script to run
Dark
Line: 1 Column: 1

Inputs | print() output | Errors | Cache | Safety Options

Add Input

Revert to Saved
Delete

Save As

Clear Unused
Rename

Save
Apply

Left click on the *Table* button

In the *Table* **popup**, navigate to the Read CSV table

In the *Equation will generate* **dropdown**, select *Numbers*

Note: If the equation is set to generate a Number instead of Numbers, it will only generate a single value.

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 13 - EQ_RMR Bins (+ lith offset) Star this

Table: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV /
Equation will generate: Numbers
 Filter rows:

Equation

1

Inputs | print() output | Errors | Cache | Safety Options

Add Input

Revert to Saved
Delete

Save As

Clear Unused
Rename

Save
Apply

60

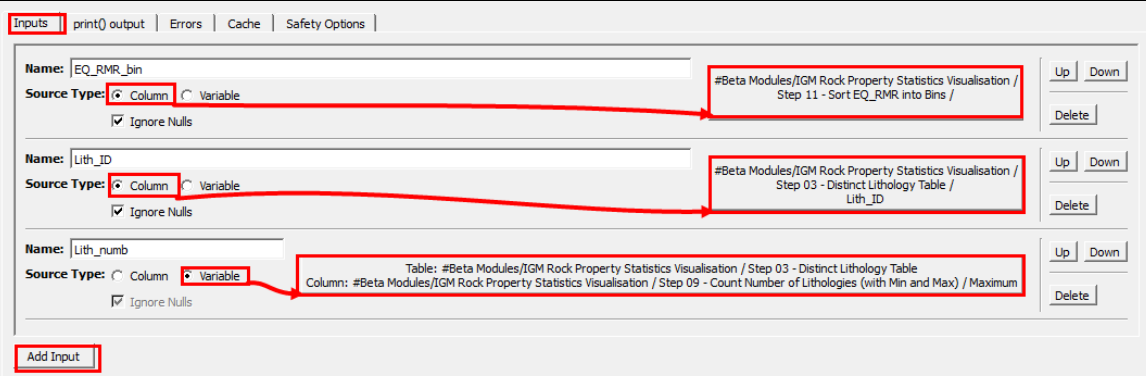
Left click on the *Inputs* tab to open it
 Left click on the *Add Input* button
 Left click on the *Column* toggle to select it
 Left click on the *Source* button, in the *Choose Column for popup*, navigate to the the Sort EQ_RMR into Bins output from the Step 11 Row Calculation output
 Type in the *Name* of the input as “EQ_RMR_bin”

Left click on the *Inputs* tab to open it
 Left click on the *Add Input* button
 Left click on the *Column* toggle to select it
 Left click on the *Source* button, in the *Choose Column for popup*, navigate to the Lith_ID
 Type in the *Name* of the input as “Lith_ID”

Left click on the *Inputs* tab to open it
 Left click on the *Add Input* button
 Left click on the *Variable* toggle to select it
 Left click on the *Source* button, in the *Choose Variable for popup*

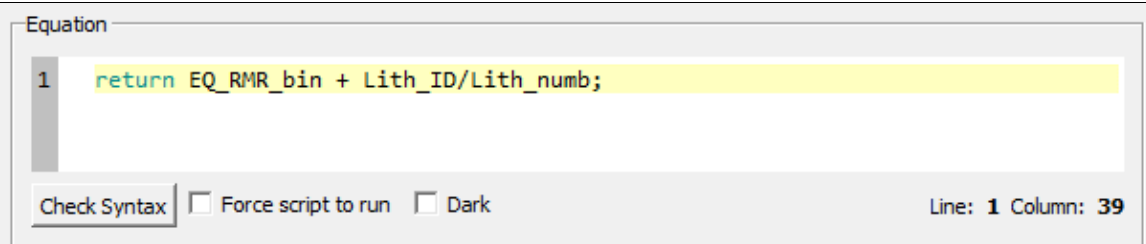
- Under the *Table* section, navigate to the Distinct Lithology Table
- Under the *Columns in Table* section, navigate to the Maximum obtained from the Step 09 accumulation

Type in the *Name* of the input as “Lith_num”



In the *Equation* box, **type** the following code:
return EQ_RMR_bin + Lith_ID/Lith_num;

Check the syntax



Save the Tool

Analysis Step G – Creating a PDF Chart of all Lithologies

Create and Save a new *Chart
Create * Chart

Save As
Folder: #Beta Modules/IGM Rock Property Statistics Visualisation
Name: Step G – PDF per Lithology Chart

As before, **left click** on the *Configure Page* button
 In the *Configure page popup*:

- Left click** on the *Series* tab
- Left click** on the *Add* button
- In the *Series Name* text box, give the series an appropriate name

Comments
Titles and Panel
Series
Axes
Appearance

PDF - All

Add
Up

Remove
Down

Series Name:

Series Icon: Copy Hard-Space

Data
Markers
Advanced
Comments

Table :

Filter :

Id :

X :

Y :

Multiple Lines

Group by :

Revert to Saved
Delete

Save As

Clear Unused
Rename

Save
Apply
Cancel

Left click on the *Data* tab to open it

- **Left click** on the *Table* button
 - In the *Table popup*, navigate to the Read CSV table
- **Left click** on the *Filter* button
 - In the *Filter popup*, navigate to *All Rows
- **Left click** on the *ID* button
 - In the *Set ID popup*, set the ID to Lith_ID
- **Left click** on the *X* button
 - In the *X popup*, set the X-Values to the Sort EQ_RMR into Bins Row Calculation output from step 11
- **Left click** on the *Y* button
 - In the *Y popup*, set the Y-Values to the Count for the PDF Complete table accumulation created in step 12
- **Tick** the *Multiple Lines Group By* box
- **Left click** on the *Multiple Lines Group By* button
 - In the *Group (1) popup*, set the Group to the Lithology under the Read CSV
 - In the *Group (2) popup*, set the Group to the Sort EQ_RMR into Bins Row Calculation output from step 11

Series Name: PDF - All

Series Icon: Copy Hard-

Data | Markers | Advanced | Comments

Table : #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV /

Filter : * All Rows

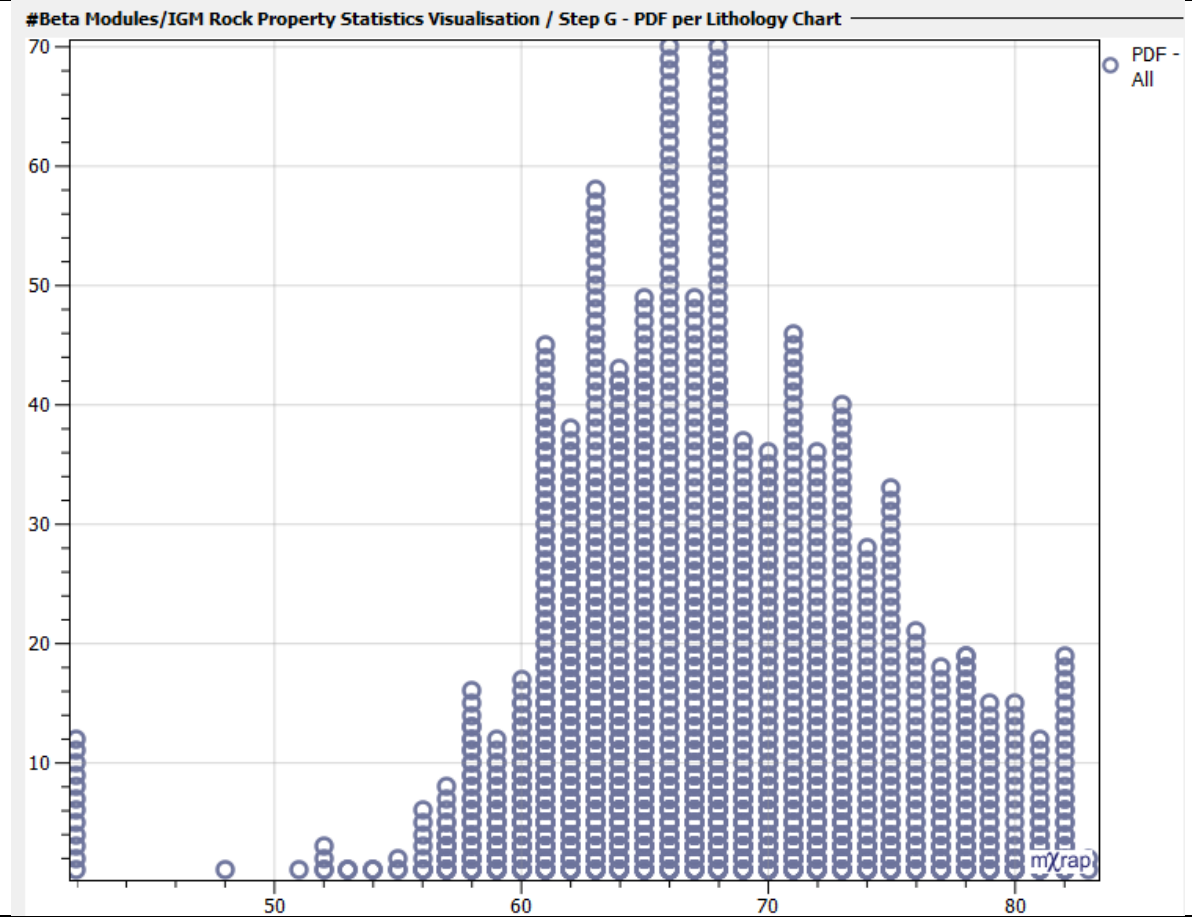
Id : #Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology Table / Lith_ID

X : Bottom #Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins /

Y : Left #Beta Modules/IGM Rock Property Statistics Visualisation / Step 12 - PDF Complete table (Grouped by liths and bins) / Count

Multiple Lines Group by : #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Lithology #Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins /

The Chart should look something like this



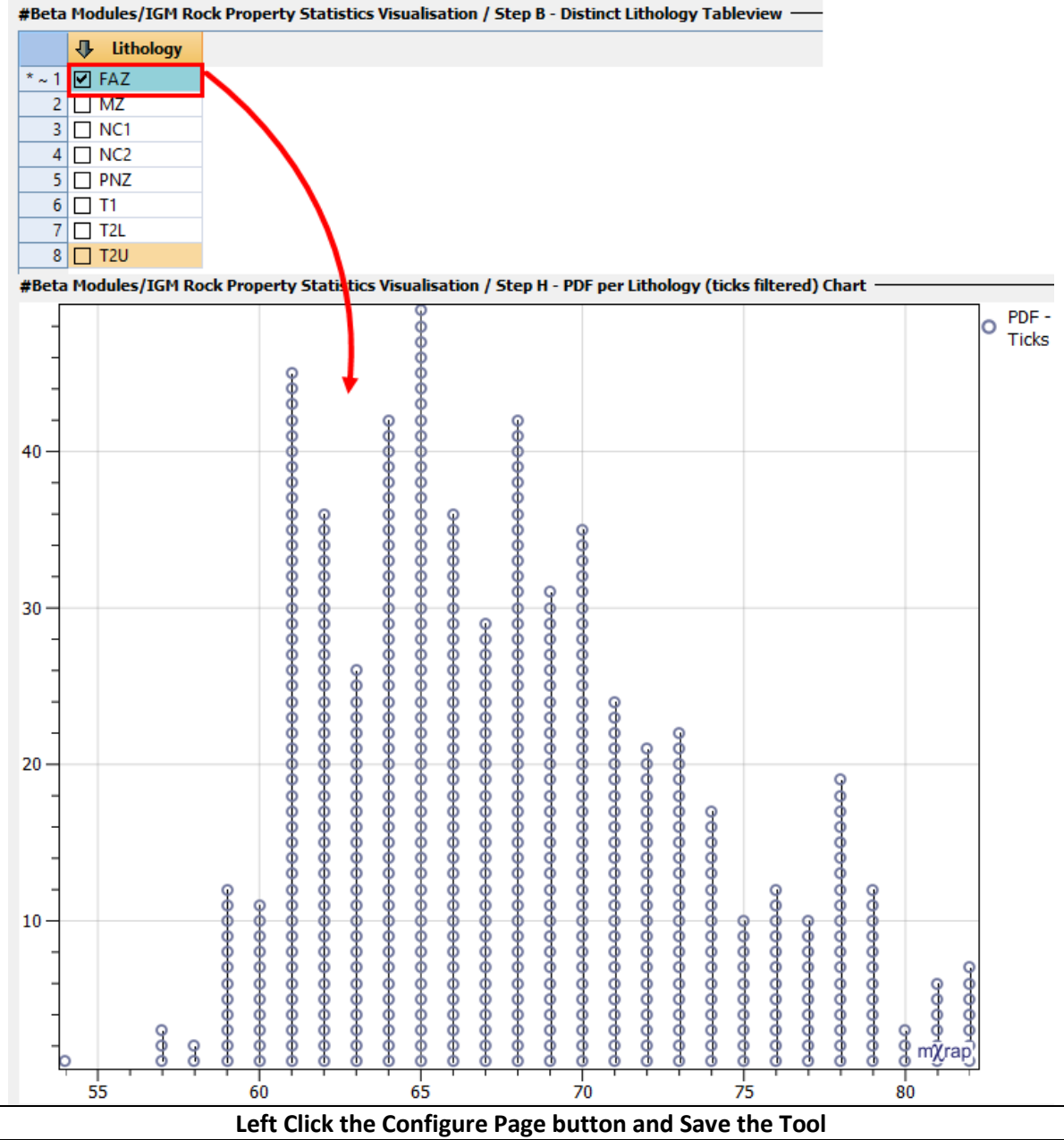
Left Click the Configure Page button and Save the Tool

Analysis Step H – Creating a PDF Chart for the Ticked Lithologies

Create and Save a new *Chart	Create * Chart																																			
<div style="border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;"> Save As Folder: #Beta Modules/IGM Rock Property Statistics Visualisation </div> <div style="border: 1px solid #ccc; padding: 2px;"> Name: Step H – PDF per Lithology (ticks filtered) Chart </div>																																				
<p>As before, left click on the <i>Configure Page</i> button</p> <p>In the <i>Configure page popup</i>:</p> <ul style="list-style-type: none"> Left click on the <i>Series</i> tab Left click on the <i>Add</i> button In the <i>Series Name</i> text box, give the series an appropriate name 																																				
<div style="border: 1px solid #ccc; padding: 5px; width: fit-content; margin: 0 auto;"> Series Name: PDF - Ticks </div>																																				
<p>Left click on the <i>Data</i> tab to open it</p> <ul style="list-style-type: none"> Left click on the <i>Table</i> button <ul style="list-style-type: none"> In the <i>Table popup</i>, navigate to the Read CSV table Left click on the <i>Filter</i> button <ul style="list-style-type: none"> In the <i>Filter popup</i>, navigate to Ticks filter under the table map created in Step 05 Left click on the <i>ID</i> button <ul style="list-style-type: none"> In the <i>Set ID popup</i>, set the ID to Lith_ID Left click on the <i>X</i> button <ul style="list-style-type: none"> In the <i>X popup</i>, set the X-Values to the Sort EQ_RMR into Bins Row Calculation output from step 11 Left click on the <i>Y</i> button <ul style="list-style-type: none"> In the <i>Y popup</i>, set the Y-Values to the Count for the PDF Complete table accumulation created in step 12 Tick the <i>Multiple Lines Group By</i> box Left click on the <i>Multiple Lines Group By</i> button <ul style="list-style-type: none"> In the <i>Group (1) popup</i>, set the Group to the Lithology under the Read CSV In the <i>Group (2) popup</i>, set the Group to the Sort EQ_RMR into Bins Row Calculation output from step 11 																																				
<p><i>Note: This chart differs from the chart in Step G only in the filter it uses.</i></p>																																				
<div style="border: 1px solid #ccc; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; border-bottom: 1px solid #ccc;">Data</td> <td style="width: 10%; border-bottom: 1px solid #ccc;">Markers</td> <td style="width: 10%; border-bottom: 1px solid #ccc;">Advanced</td> <td style="width: 10%; border-bottom: 1px solid #ccc;">Comments</td> <td style="width: 60%;"></td> </tr> <tr> <td style="border-bottom: 1px solid #ccc;">Table :</td> <td colspan="4" style="border-bottom: 1px solid #ccc; padding: 2px;">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV /</td> </tr> <tr> <td style="border-bottom: 1px solid #ccc;">Filter :</td> <td colspan="4" style="border-bottom: 1px solid #ccc; padding: 2px; border: 2px solid red;">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 05 - Map Ticks (Distinct Lithology table to Complete table) / Ticks</td> </tr> <tr> <td style="border-bottom: 1px solid #ccc;">Id :</td> <td colspan="4" style="border-bottom: 1px solid #ccc; padding: 2px;">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology Table / Lith_ID</td> </tr> <tr> <td style="border-bottom: 1px solid #ccc;">X : Bottom</td> <td colspan="4" style="border-bottom: 1px solid #ccc; padding: 2px;">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins /</td> </tr> <tr> <td style="border-bottom: 1px solid #ccc;">Y : Left</td> <td colspan="4" style="border-bottom: 1px solid #ccc; padding: 2px;">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 12 - PDF Complete table (Grouped by liths and bins) / Count</td> </tr> <tr> <td style="border-bottom: 1px solid #ccc;"><input checked="" type="checkbox"/> Multiple Lines Group by :</td> <td style="border-bottom: 1px solid #ccc; padding: 2px;">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Lithology</td> <td colspan="3" style="border-bottom: 1px solid #ccc; padding: 2px;">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins /</td> </tr> </table> </div>		Data	Markers	Advanced	Comments		Table :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV /				Filter :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 05 - Map Ticks (Distinct Lithology table to Complete table) / Ticks				Id :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology Table / Lith_ID				X : Bottom	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins /				Y : Left	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 12 - PDF Complete table (Grouped by liths and bins) / Count				<input checked="" type="checkbox"/> Multiple Lines Group by :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Lithology	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins /		
Data	Markers	Advanced	Comments																																	
Table :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV /																																			
Filter :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 05 - Map Ticks (Distinct Lithology table to Complete table) / Ticks																																			
Id :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology Table / Lith_ID																																			
X : Bottom	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins /																																			
Y : Left	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 12 - PDF Complete table (Grouped by liths and bins) / Count																																			
<input checked="" type="checkbox"/> Multiple Lines Group by :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Lithology	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins /																																		

The Chart should look something like this.

Note: This chart changes depending on the ticks in the Distinct Lithology Table



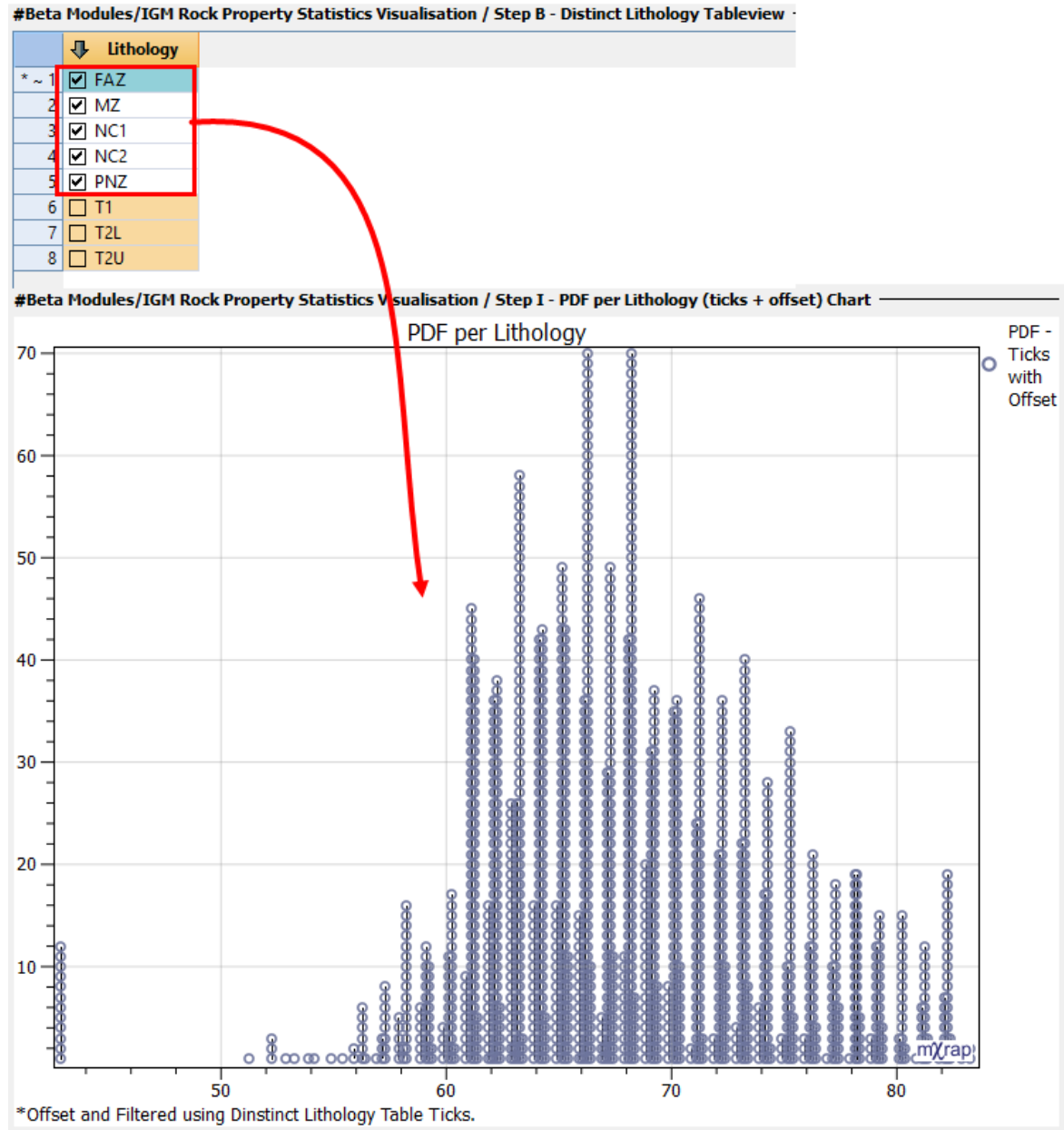
Analysis Step I – Creating a PDF Chart for the Lithologies (Including an Offset)

Create and Save a new *Chart		Create * Chart																												
Save As	Folder: #Beta Modules/IGM Rock Property Statistics Visualisation																													
Name: Step I – PDF per Lithology (ticks + offset) Chart																														
As before, left click on the <i>Configure Page</i> button																														
In the <i>Configure page popup</i> :																														
<ul style="list-style-type: none"> • Left click on the <i>Series</i> tab • Left click on the <i>Add</i> button • In the <i>Series Name</i> text box, give the series an appropriate name 																														
	Series Name:	PDF - Ticks with Offset																												
Left click on the <i>Data</i> tab to open it																														
<ul style="list-style-type: none"> • Left click on the <i>Table</i> button <ul style="list-style-type: none"> ○ In the <i>Table popup</i>, navigate to the Read CSV table • Left click on the <i>Filter</i> button <ul style="list-style-type: none"> ○ In the <i>Filter popup</i>, navigate to Ticks filter under the table map created in Step 05 • Left click on the <i>ID</i> button <ul style="list-style-type: none"> ○ In the <i>Set ID popup</i>, set the ID to Lith_ID • Left click on the <i>X</i> button <ul style="list-style-type: none"> ○ In the <i>X popup</i>, set the X-Values to the EQ_RMR Bins (+ lith offset) row calculation output from Step 13 • Left click on the <i>Y</i> button <ul style="list-style-type: none"> ○ In the <i>Y popup</i>, set the Y-Values to the Count for the PDF Complete table accumulation created in step 12 • Tick the <i>Multiple Lines Group By</i> box • Left click on the <i>Multiple Lines Group By</i> button <ul style="list-style-type: none"> ○ In the <i>Group (1) popup</i>, set the Group to the Lithology under the Read CSV ○ In the <i>Group (2) popup</i>, set the Group to the Sort EQ_RMR into Bins Row Calculation output from step 11 																														
<i>Note: This chart differs from the chart in Step H only in the X-Axis values it uses.</i>																														
<table border="1"> <tr> <td>Data</td> <td>Markers</td> <td>Advanced</td> <td>Comments</td> </tr> <tr> <td>Table :</td> <td colspan="3">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV /</td> </tr> <tr> <td>Filter :</td> <td colspan="3">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 05 - Map Ticks (Distinct Lithology table to Complete table) / Ticks</td> </tr> <tr> <td>Id :</td> <td colspan="3">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology Table / Lith_ID</td> </tr> <tr> <td>X :</td> <td>Bottom</td> <td colspan="2">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 13 - EQ_RMR Bins (+ lith offset) /</td> </tr> <tr> <td>Y :</td> <td>Left</td> <td colspan="2">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 12 - PDF Complete table (Grouped by liths and bins) / Count</td> </tr> <tr> <td><input checked="" type="checkbox"/> Multiple Lines Group by :</td> <td>#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Lithology</td> <td colspan="2">#Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins /</td> </tr> </table>			Data	Markers	Advanced	Comments	Table :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV /			Filter :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 05 - Map Ticks (Distinct Lithology table to Complete table) / Ticks			Id :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology Table / Lith_ID			X :	Bottom	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 13 - EQ_RMR Bins (+ lith offset) /		Y :	Left	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 12 - PDF Complete table (Grouped by liths and bins) / Count		<input checked="" type="checkbox"/> Multiple Lines Group by :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Lithology	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins /	
Data	Markers	Advanced	Comments																											
Table :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV /																													
Filter :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 05 - Map Ticks (Distinct Lithology table to Complete table) / Ticks																													
Id :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology Table / Lith_ID																													
X :	Bottom	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 13 - EQ_RMR Bins (+ lith offset) /																												
Y :	Left	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 12 - PDF Complete table (Grouped by liths and bins) / Count																												
<input checked="" type="checkbox"/> Multiple Lines Group by :	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Lithology	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 11 - Sort EQ_RMR into Bins /																												

The Chart should look something like this.

Note: This chart changes depending on the ticks in the Distinct Lithology Table

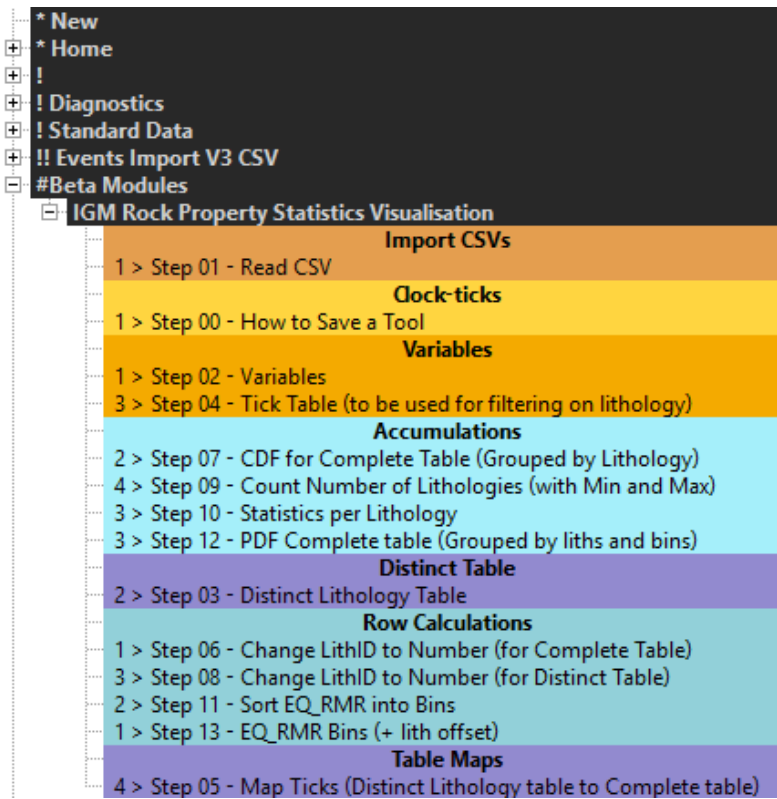
Note: The lithologies are slightly offset from each other. Once marker styles are applied (later in the walkthrough) the purpose of this offset will become particularly apparent.



Left Click the Configure Page button and Save the Tool

Application Progress (Section 6)

The tool tree in the Settings Window should now look as follows. Following the naming convention will make it easier to follow the walkthrough steps.



A PDF function has been created using a combination of a row calculation and an accumulation. This PDF is displayed using various charts, with the last of three charts filtered using the ticks from the Distinct Lithologies Table. The lithologies on the chart are also offset (using a row calculation) to make it easier to view the data for each lithology

Step Z - How to save an Analysis Tool	Step A - Full Dataset Tableview
Step B - Distinct Lithology Tableview	Step C - Complete Table (ticks filtered) Tableview
Step F - Statistics per Lithology Tableview	
Step D - CDF per Lithology Chart	Step E - CDF per Lithology (ticks filtered) Chart
Step G - PDF per Lithology Chart	Step H - PDF per Lithology (ticks filtered) Chart
Step I - PDF per Lithology (ticks + offset) Chart	

In the next section, Marker Styles will be created. These Marker Styles will be applied to the charts and tables that will be included in the final application.

7. Markers

Settings Step 14 – Marker Style created for each lithology

Marker style tools are used in the Analysis Window and determine the marker colours and shapes used to visualise the data.

Create and Save a new *Marker Style tool
* Marker Style

Save As *Folder: #Beta Modules/IGM Rock Property Statistics Visualisation*
Name: Step 14 – Marker Style for Lithology

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 14 - Marker Style for Lithology Star this tool

Scheme: Symbol-colour scheme: Use one marker only ▼

Short Label for Legend:

Symbol:

Colour: ...

Blending (pseudo volumetric rendering)

Note: anything other than 0% transparency will slow down both 2D and 3D displays

Transparency: 0 % Link

All of these modes require transparency > 0% to activate blending

Blend-normal mode
Looks like a bowl of jelly

Blend-accumulate mode
Looks like a galaxy of stars
Requires a dark coloured background and light marker colours

Blend-subtract mode
Looks like a dark storm cloud
Requires a light coloured background and dark marker colours

3D Specific Settings

Disable Depth-Test
Markers will be drawn on top of other markers and polygons

Revert to Saved Delete

Save As Auto Apply

Clear Unused Rename

Save Apply

Left click on the *Scheme* dropdown and set the scheme to Symbol-colour scheme: Use a range of markers and colours

In the *Short Label for Legend* textbox, give the marker an appropriate name such as “Lithologies”

Scheme: Symbol-colour scheme: Use a range of markers and colours ▼

Short Label for Legend: Lithologies

Left click on the *Basics* tab to open it

Left click on the *Input* button, in the *Choose Marker Input* popup

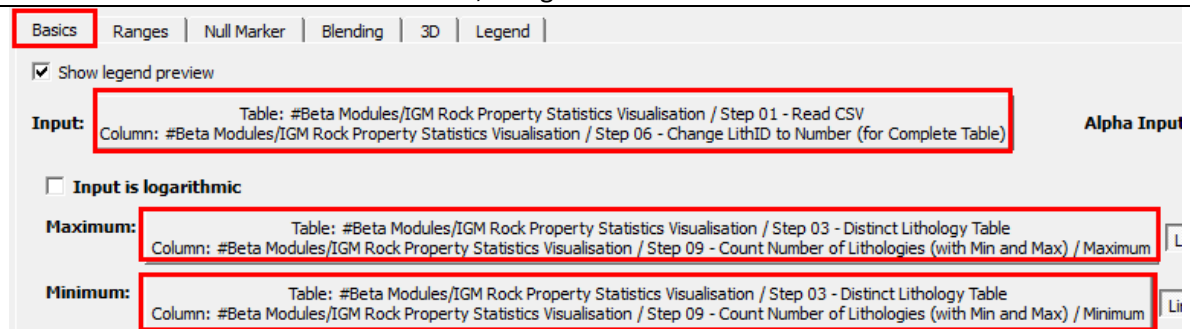
- In the *Tables* section, navigate to the CSV table
- In the *Columns in Table* section, add in the Change LithID to Number row calculation output from Step 06

Left click on the *Maximum* button, in the *Fixed Maximum* popup

- In the *Tables* section, navigate to the Distinct Lithology Table
- In the *Columns in Table* section, navigate to the Maximum

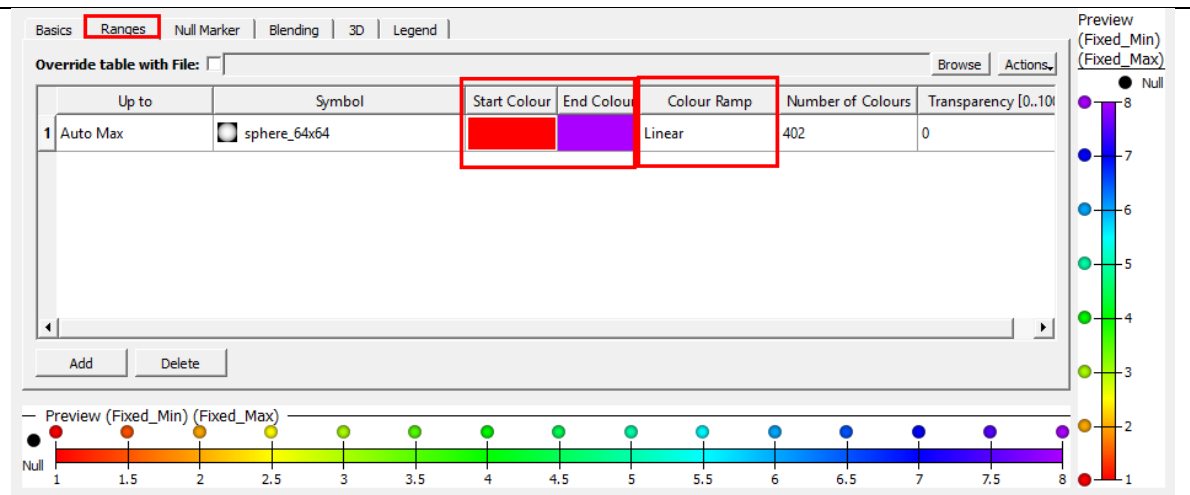
Left click on the *Minimum* button, in the *Fixed Minimum* popup

- In the *Tables* section, navigate to the Distinct Lithology Table
- In the *Columns in Table* section, navigate to the Minimum



Left click on the *Ranges* tab to open it

- **Double left click** on the *Colour Ramp* and select Linear
- **Double left click** on the *Start Colour* and *End Colour* and choose an appropriate colour for each



Save the Tool

Settings Step 15 – Creating a new Marker Style for the Distinct Lithology Table

This marker style will give a unique colour to each of the lithologies.

Create and Save a new *Marker Style tool
* Marker Style

Save As

Folder: #Beta Modules/IGM Rock Property Statistics Visualisation

Name: Step 15 – Marker Style for Distinct Lithology Table

#Beta Modules/IGM Rock Property Statistics Visualisation / Step 15 - Marker Style for Distinct Lithology Table
 Star this tool

Scheme: Symbol-colour scheme: Use one marker only ▼

Short Label for Legend:

Symbol:

Colour: ...

Blending (pseudo volumetric rendering)

Note: anything other than 0% transparency will slow down both 2D and 3D displays

Transparency: 0 % Link

All of these modes require transparency > 0% to activate blending

Blend-normal mode
Looks like a bowl of jelly

Blend-accumulate mode
Looks like a galaxy of stars
Requires a dark coloured background and light marker colours

Blend-subtract mode
Looks like a dark storm cloud
Requires a light coloured background and dark marker colours

3D Specific Settings

Disable Depth-Test
Markers will be drawn on top of other markers and polygons

Revert to Saved

Delete

Save As

Auto Apply

Clear Unused

Rename

Save

Apply

Left click on the *Scheme dropdown* and set the scheme to Symbol-colour scheme: Use a range of markers and colours

In the *Short Label for Legend textbox*, give the marker an appropriate name such as “Lithologies”

Scheme: Symbol-colour scheme: Use a range of markers and colours ▼

Short Label for Legend: Lithologies

Left click on the *Basics* tab to open it

Left click on the *Input* button, in the *Choose Marker Input* popup

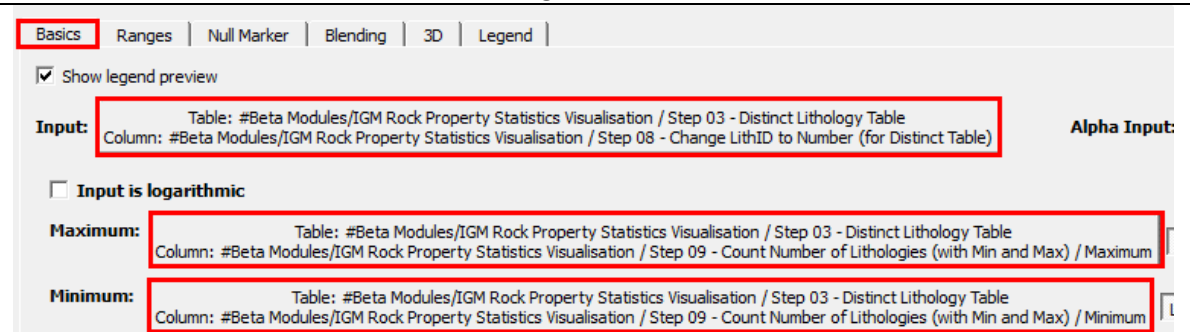
- In the *Tables* section, navigate to the Distinct Lithology Table
- In the *Columns in Table* section, add in the Change LithID to Number row calculation output from Step 08

Left click on the *Maximum* button, in the *Fixed Maximum* popup

- In the *Tables* section, navigate to the Distinct Lithology Table
- In the *Columns in Table* section, navigate to the Maximum

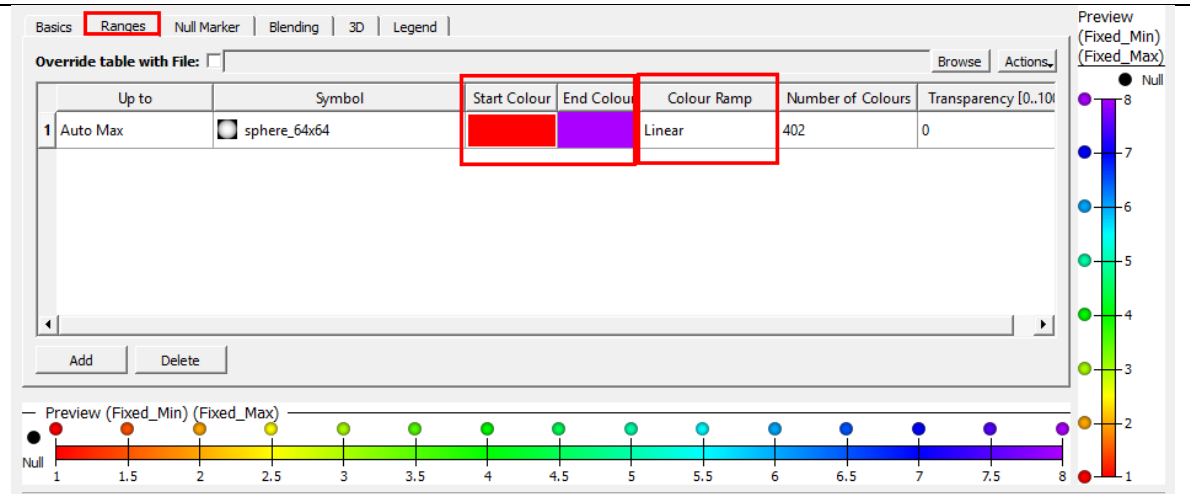
Left click on the *Minimum* button, in the *Fixed Minimum* popup

- In the *Tables* section, navigate to the Distinct Lithology Table
- In the *Columns in Table* section, navigate to the Minimum



Left click on the *Ranges* tab to open it

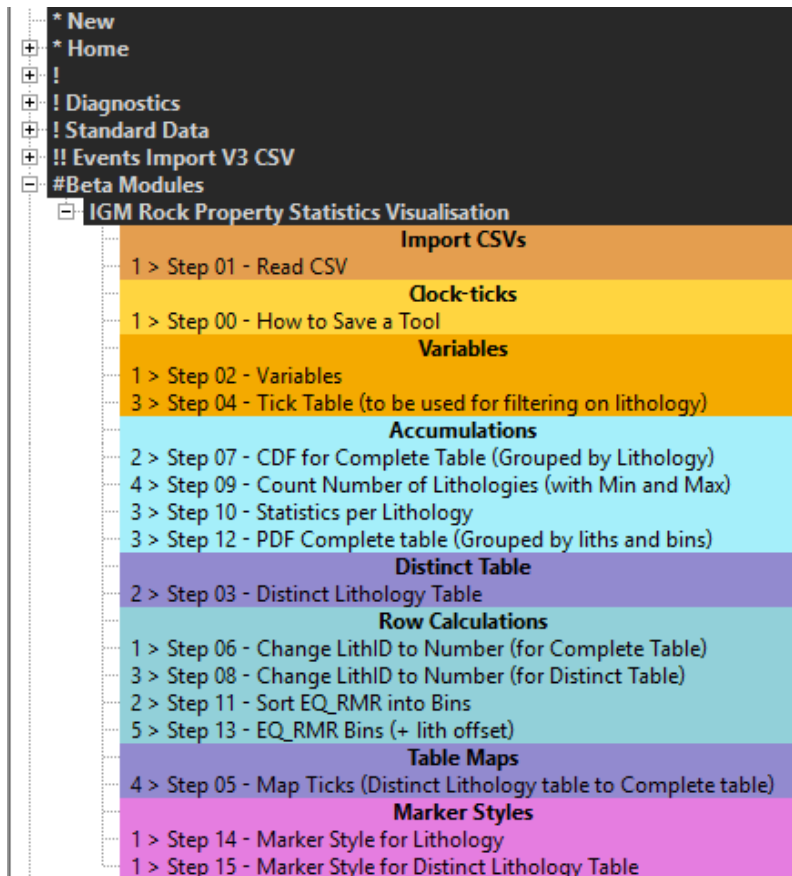
- **Double left click** on the *Colour Ramp* and select Linear
- **Double left click** on the *Start Colour* and *End Colour* and choose an appropriate colour for each



Save the Tool

Application Progress (Section 7)

The tool tree in the Settings Window should now look as follows. Following the naming convention will make it easier to follow the walkthrough steps.



Markers have now been created. These will be added in to the relevant charts and tables after the interface tools have been completed.

Step Z - How to save an Analysis Tool	Step A - Full Dataset Tableview
Step B - Distinct Lithology Tableview	Step C - Complete Table (ticks filtered) Tableview
Step F - Statistics per Lithology Tableview	
Step D - CDF per Lithology Chart	Step E - CDF per Lithology (ticks filtered) Chart
Step G - PDF per Lithology Chart	Step H - PDF per Lithology (ticks filtered) Chart
Step I - PDF per Lithology (ticks + offset) Chart	

In the next section, the application interface tools will be created.

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8. Interface

Interface submenu

The interface is a set of tools created for the purpose of building the frontend of the app. To differentiate from the tools previously created in the Settings Window, it is advised to save the tools created for the interface under a new submenu (named @interface in this case)

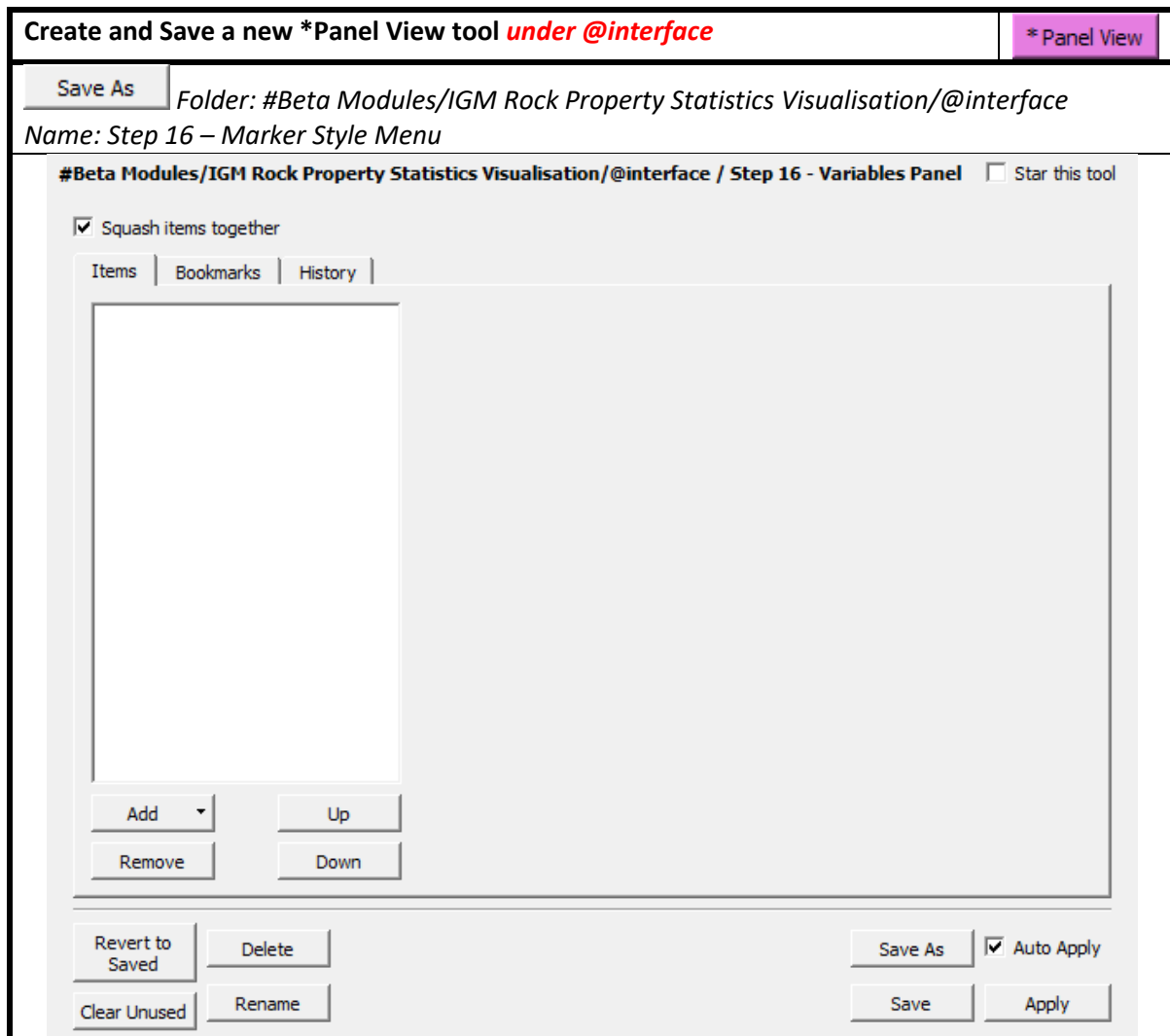
The Analysis Tools will be saved in the root folder under the directory:

#Beta Modules/IGM Rock Property Statistics Visualisation Example/@interface

Each interface step (Settings window) will be saved Numerically eg Step 16 – Marker Style Menu

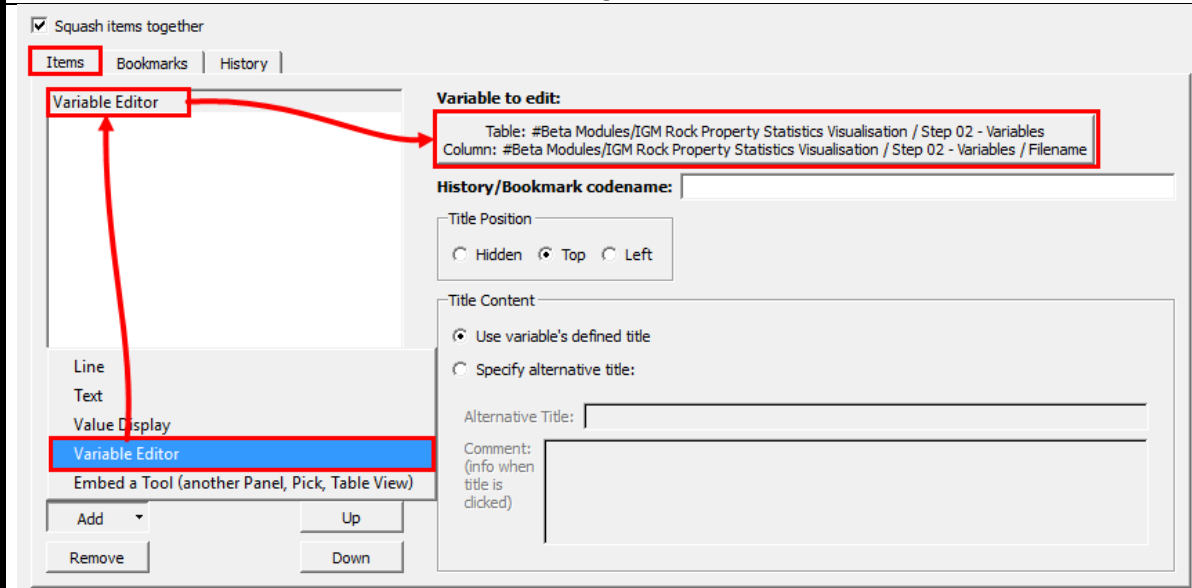
Settings Step 16 – Creating a Variables Panel for the App

Variables panels are created for the user of the app to change a set of predefined parameters. In this case, this variables panel will be set up to allow the user to change the input CSV file within the app instead of necessitating the use of the Settings Window.



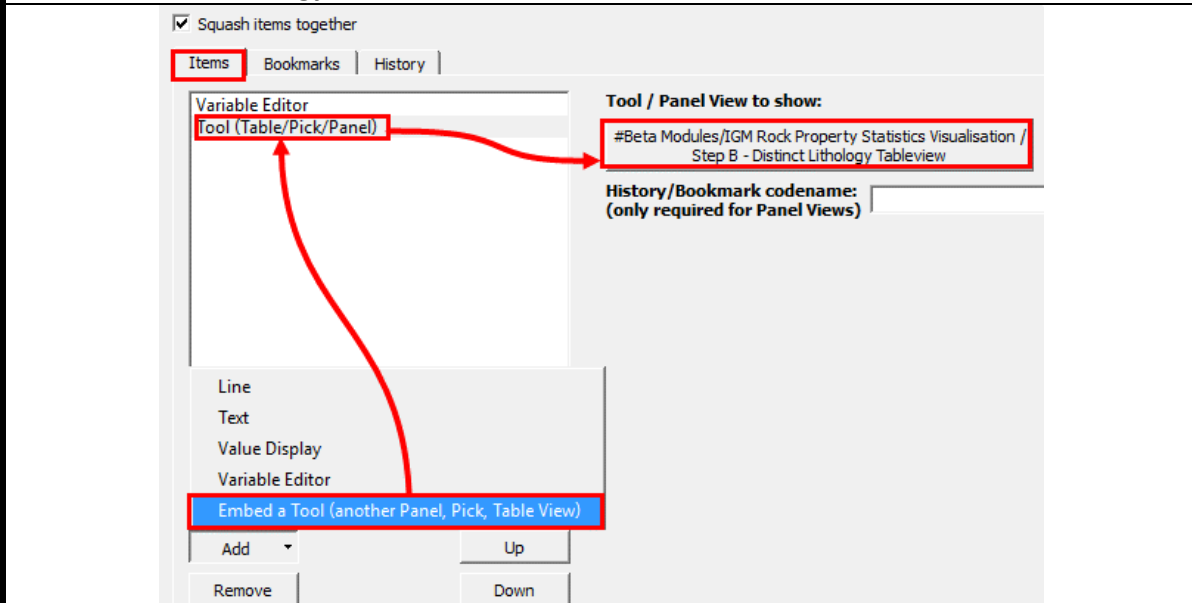
- Left click on the *Items* tab to open it
 - Left click on the **Add dropdown** and add a Variable Editor
 - Left click on the *Variable Editor* item
 - Left click on the *Variable to edit* button
- In the *Choose Variable popup*

- Under the *Tables* section, navigate to the Variable table created in Step 02
- Under the *Columns in Table* section, navigate to the Filename variable column



- Left click on the *Items* tab to open it
 - Left click on the **Add dropdown** and add a Embed a tool (another Panel, Pick, Table View)
 - Left click on the *Tool (Table/Pick/Panel)* item
 - Left click on the *Tool/Panel View to show* button
- In the *Tool/Panel View to show dropdown list*, navigate to the Distinct Lithology Tableview created in Step B using the following route

- Table Views >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step B – Distinct Lithology Tableview**



Save the Tool

Settings Step 17 – Creating a Menu Definition for the Marker Styles

Menus contain items that have been created in the Settings and Analysis Windows. In this case, the Menu Definition will contain all of the marker styles that have been created. This menu will later be added in to the analysis tools that will be used in the app.

Create and Save a new *New Menu Definition tool *under @interface* * New Menu Definition

Save As Folder: #Beta Modules/IGM Rock Property Statistics Visualisation/@interface
 Name: Step 17 – Marker Style Menu

#Beta Modules/IGM Rock Property Statistics Visualisation/@interface / Step 17 - Marker Style Menu Star this tool

Menu Definition

Menu Name	Linked Tool	Order	Type

Auto Apply

Right click in the Menu Definition window

Left click Add New Tool

In the **dropdown list**, navigate to the Marker Style created in Step 14 using the following route

- **Marker Styles >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step 14 – Maker Style for Lithology**

When **prompted**, name the tool “Lithology ID”

Right click in the Menu Definition window

Left click Add New Tool

In the **dropdown list**, navigate to the Marker Style created in Step 15 using the following route

- **Marker Styles >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step 15 – Maker Style for Distinct Lithology Table**

When **prompted**, name the tool “Distinct Lithologies”

Menu Definition

Menu Name	Linked Tool	Order	Type
Distinct Lithologies	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 15 - Marker Style for Distinct Lithology Table	100	Tool
Lithology ID	#Beta Modules/IGM Rock Property Statistics Visualisation / Step 14 - Marker Style for Lithology	100	Tool

Save the Tool

Settings Step 18 – Creating a Menu Definition for the Analysis Tools created

This menu definition contains all of the analysis tools to be displayed in the app as well as any controls that need to be included into the app.

Create and Save a new *New Menu Definition tool *under* @interface * New Menu Definition

Save As Folder: #Beta Modules/IGM Rock Property Statistics Visualisation/@interface
 Name: Step 18 – Marker Style Menu

#Beta Modules/IGM Rock Property Statistics Visualisation/@interface / Step 18 - Analysis Tools Menu Star this tool

Menu Definition

Menu Name	Linked Tool	Order	Type

Auto Apply

Right click in the Menu Definition window

Left click Add New Tool

In the **dropdown list**, navigate to the CDF chart created in Step E using the following route

- **Charts >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step E – CDF per Lithology (ticks filtered) Chart**

When **prompted**, name the tool “Charts/CDF of EQ_RMR”

Right click in the Menu Definition window

Left click Add New Tool

In the **dropdown list**, navigate to the PDF chart created in Step I using the following route

- **Charts >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step I – PDF per Lithology (ticks + offset) Chart**

When **prompted**, name the tool “Charts/PDF of EQ_RMR”

Menu Definition

Menu Name	Linked Tool	Order	Type
[-] Charts			
CDF of EQ_RMR	#Beta Modules/IGM Rock Property Statistics Visualisation / Step E - CDF per Lithology (ticks filtered) Chart	100	Tool
PDF of EQ_RMR	#Beta Modules/IGM Rock Property Statistics Visualisation / Step I - PDF per Lithology (ticks + offset) Chart	100	Tool

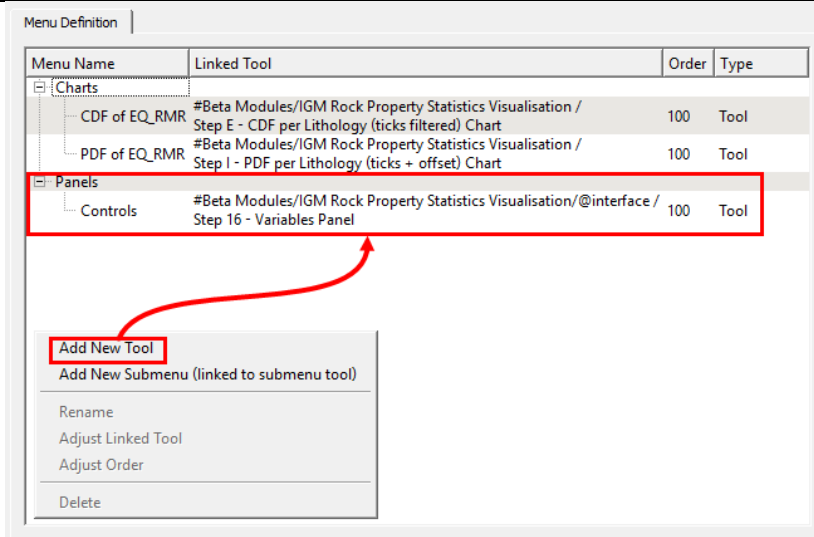
Right click in the Menu Definition window

Left click *Add New Tool*

In the **dropdown list**, navigate to the Panel View created in Step 16 using the following route

- **Panel Views >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step 16 – Variables Panel**

When **prompted**, name the tool “Panels/Controls”



Right click in the Menu Definition window

Left click *Add New Tool*

In the **dropdown list**, navigate to the Table created in Step F using the following route

- **Table Views>> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step F – Statistics per Lithology Tableview**

When **prompted**, name the tool “Tables/Lithology Summary”

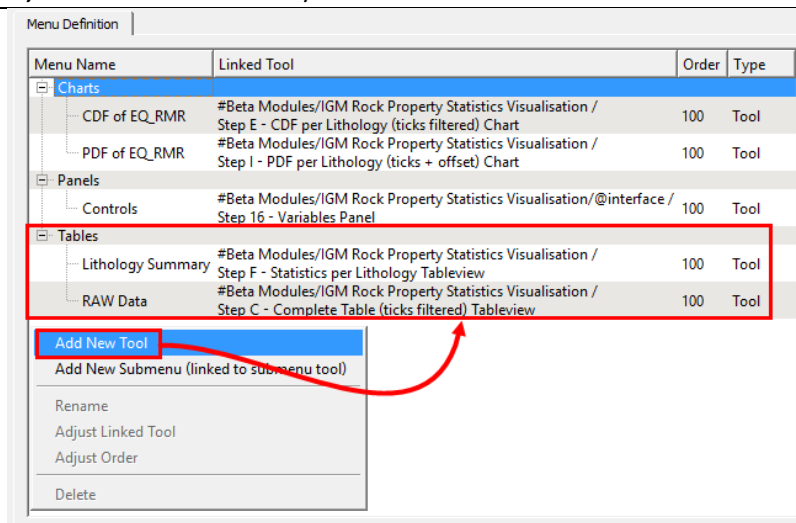
Right click in the Menu Definition window

Left click *Add New Tool*

In the **dropdown list**, navigate to the Table created in Step C using the following route

- **Table Views>> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step C – Complete Table (ticks filtered) Tableview**

When **prompted**, name the tool “Tables/RAW Data”



Save the Tool

Settings Step 19 – Creating a Window Definition

Each app requires at least one window, but can have many windows. This allows for each window to be focussed on a specific task. Separation of tools into appropriate windows helps to avoid unnecessary clutter.

Create and Save a new *Window Definition tool *under @interface*
* Window Definition

Save As

Folder: #Beta Modules/IGM Rock Property Statistics Visualisation/@interface
Name: Step 19 – Analysis Window

#Beta Modules/IGM Rock Property Statistics Visualisation/@interface / Step 19 - Analysis Window

Menu Definition

Hot Keys

Initial Tabs

Appearance

Menu Definition: Clear

Use old menu (NOTE - will be removed in future, please migrate to new "Menu Definition")

Menu Name	Tool ID	Order

Revert to Saved

Delete

Save As

Auto Apply

Clear Unused

Rename

Save

Apply

Left click on the *Menu Definitions* tab to open it
 Left click on the *Menu Definition* button and navigate to the Menu Definition created in Step 18 using the following route

- **Menu Definitions >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step 18 – Analysis Tools Menu**

Menu Definition
Hot Keys
Initial Tabs
Appearance

Menu Definition: #Old/IGM Rock Property Statistics Example/@interface / Step 18 - Analysis Tools Menu Clear

Use old menu (NOTE - will be removed in future, please migrate to new "Menu Definition")

Menu Name	Tool ID	Order

Save the Tool

Settings Step 20 – Creating an App definition to complete the App build process

Finally, the app definition simply contains all of the windows that should be included into the application.

* App Definition

Create and Save a new *App Definition tool *under @interface*

Save As Folder: #Beta Modules/IGM Rock Property Statistics Visualisation/@interface
 Name: Step 20 – App Definition

#Beta Modules/IGM Rock Property Statistics Visualisation/@interface / Step 20 - App Definition Star this tool

Title:

Windows

Show all defined windows
 Limit available windows to:

Window Name	Tool ID	Open at Start

Revert to Saved Delete

Clear Unused Rename

Save As Auto Apply

Save Apply

In the **Title** **textbox**, enter an appropriate app name. For this walkthrough, the name is: "IGM ---> Rock Properties Statistics Visualisation"

Right click in the Menu Definition window
Left click *Add New Window*

In the **dropdown list**, navigate to the Window Definition created in Step 19 using the following route

- **Window Definitions >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step 19 – Analysis Window**

When **prompted**, name the tool "Rock Properties Window"

Double left click on the Window Definitions *Open at Start* column, and set it to *True*

#Beta Modules/IGM Rock Property Statistics Visualisation/@interface / Step 20 - App Definition Star this tool

Title: IGM ---> Rock Properties Statistics Visualisation

Windows

Show all defined windows
 Limit available windows to:

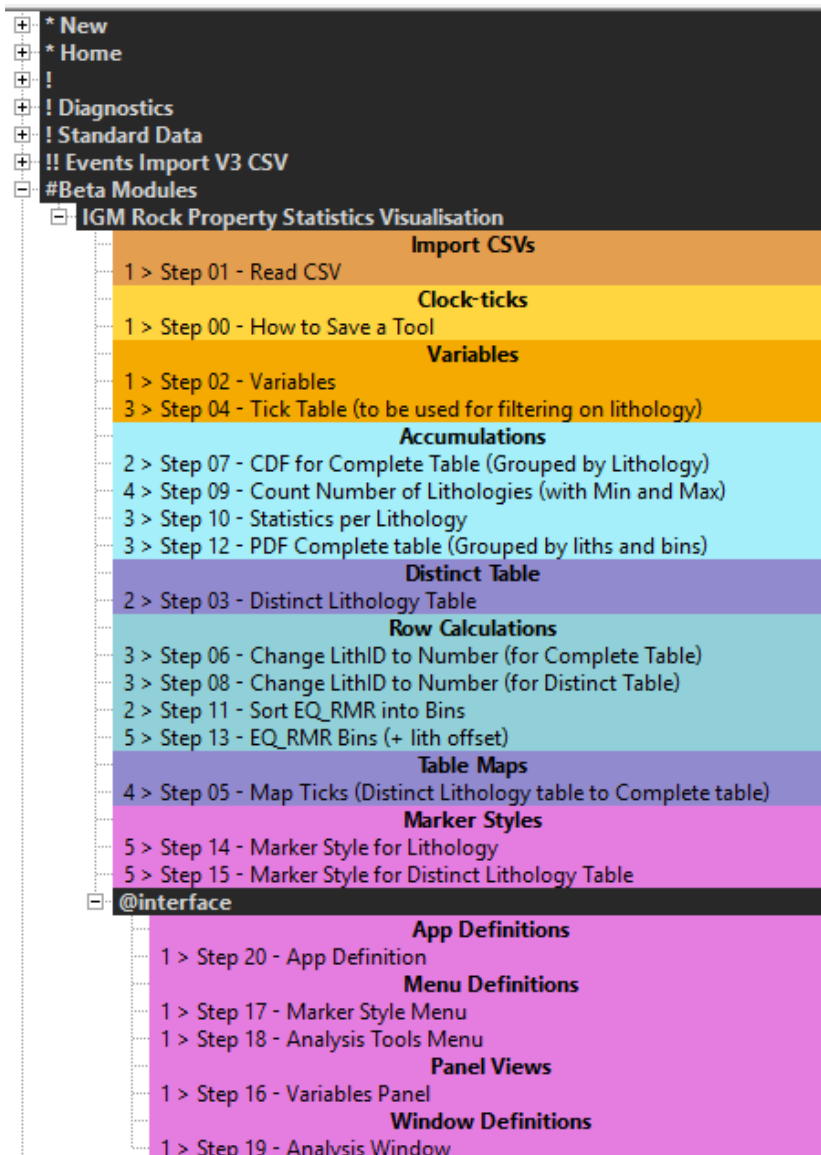
Window Name	Tool ID	Open at Start
Rock Properties Window	#Beta Modules/IGM Rock Property Statistics Visualisation/@interface / Step 19 - Analysis Window	True

Add New Window →

Save the Tool

Application Progress (Section 8)

The tool tree in the Settings Window should now look as follows. Following the naming convention will make it easier to follow the walkthrough steps.



The interface is now complete.

Step Z - How to save an Analysis Tool	Step A - Full Dataset Tableview
Step B - Distinct Lithology Tableview	Step C - Complete Table (ticks filtered) Tableview
Step F - Statistics per Lithology Tableview	
Step D - CDF per Lithology Chart	Step E - CDF per Lithology (ticks filtered) Chart
Step G - PDF per Lithology Chart	Step H - PDF per Lithology (ticks filtered) Chart
Step I - PDF per Lithology (ticks + offset) Chart	

In the next section, the marker styles will be applied to the application charts and tables.

9. Applying LithoID Markers

Analysis Step C Continued – Adding Markers to Complete Ticks Table

Open the Complete Table with Ticks Tableview
Step C - Complete Table (ticks filtered) Tableview

#Beta Modules/IGM Rock Property Statistics Visualisation / Step C - Complete Table (ticks filtered) Tableview

	Ticks	Lithology
432	Included	FAZ
433	Included	FAZ
434	Included	FAZ
435	Included	FAZ
436	Included	FAZ
437	Included	FAZ

Left click on the *Configure Page* button
 In the *Configure page popup*:

- **Tick** the *Marker Menu* box
- In the *Marker Menu dropdown*, navigate to the Marker Menu created in Step 17 using the following route
 - **Menu Definitions >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step 17 – Marker Style Menu**
- **Tick** on the *BHID, Lithology, Eq_RMR, From* and *To* columns to show them in the table.

Show row/column headers as: labels (default) column sources (debugging)

Comments | Titles and Panel | Values Table | Columns Table | Appearance

Show Columns table

Table: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV / Filter: * All Rows Id: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 01 - Read CSV /

Filter columns by name:

My category only Filter type: Filter

Show ticked items only

Expand All Collapse All

- All Rows
- * Home
- #Beta Modules
 - IGM Rock Property Statistics Visualisation
 - Step 01 - Read CSV
 - BHID
 - Lithology
 - Eq_RMR
 - From
 - To
 - Step 03 - Distinct Lithology Table
 - Step 05 - Map Ticks (Distinct Lithology table to Co
 - Step 06 - Change LithID to Number (for Complete
 - Step 07 - CDF for Complete Table (Grouped by Lith
 - Step 11 - Sort EQ_RMR into Bins
 - Step 12 - PDF Complete table (Grouped by liths and
 - Step 13 - EQ_RMR Bins (+ lith offset)

Ticks

Tick column:

Tick value:

Marker Menu

#Beta Modules/IGM Rock Property Statistics Visualisation/@interface / Step 17 - Marker Style Menu

Clear

Right click on the *Lithology* column heading and then left click on *Configure marker style*

#Beta Modules/IGM Rock Property Statistics Visualisation / Step C - Complete Table (ticks filtered) Tableview

	Ticks	Lithology	BHID	Eq_RMR	From	To
432	Included	FAZ			764.18	774.18
433	Included	FAZ			774.18	784.18
434	Included	FAZ			784.18	792.23
435	Included	FAZ			864	874
436	Included	FAZ			874	884
437	Included	FAZ			884	894
438	Included	FAZ			894	904
439	Included	FAZ			836	846
440	Included	FAZ			846	856
441	Included	FAZ			856	866
442	Included	FAZ			866	876
443	Included	FAZ			876	886
444	Included	FAZ			886	896
445	Included	FAZ			896	906
446	Included	FAZ			906	915.43
447	Included	FAZ			842	852
448	Included	FAZ			852	862
449	Included	FAZ			862	872
450	Included	FAZ			872	882

Context menu options for Lithology:

- Invert sort
- Use for Sort term 1
- Use for Sort term 2
- Use for Sort term 3
- Don't sort with this column
- Set label for this column
- Configure data display format
- Configure marker style**
- Hide columns
- Show all hidden columns
- Goto Source
- Goto Source in New Tab
- Goto Source in New Window

Set Column Markerstyle

Set format for: Lithology

Do not use any styling

Colour cell background

Show marker in cell

Marker Style:

Lithology ID

Show in legend Right

Close

The table should now look something like this

#Beta Modules/IGM Rock Property Statistics Visualisation / Step C - Complete Table (ticks filtered) Tableview

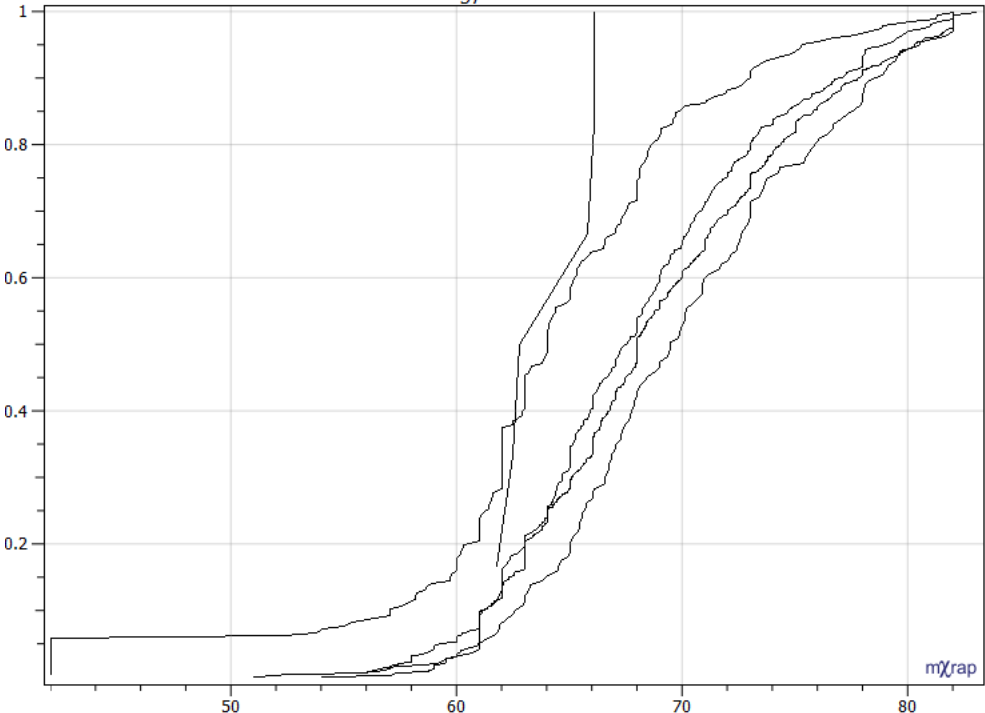
	Ticks	Lithology	BHID	Eq_RMR	From	To
10	Included	PNZ	GT008	42	1,200	1,210
11	Included	PNZ	GT008	42	1,210	1,220
12	Included	PNZ	GT008	42	1,220	1,225...
13		T1	UMT142	48.903	667	677
14	Included	MZ	UMT301	51.015	30	40
15	Included	MZ	UMT301	52	10	20
16	Included	MZ	UMT301	52	20	30
17	Included	PNZ	GT012	52.296	1,144...	1,154...

Left Click the **Configure Page** button and **Save the Tool**

Analysis Step E Continued – Adding Markers to CDF Chart

Open the CDF per Lithology (ticks filtered) Chart
Step F - CDF per Lithology (ticks filtered) Chart

Lithology CDF Chart



*Filtered using Distinct Lithology Table ticks

As before, **left click** on the *Configure Page* button
 In the *Configure page popup*:

- **Left click** on the *Series* tab
- In the *Series* tab, **left click** on the *Markers* tab
- **Tick** the *Marker Menu (colours/shapes)*
- **Left click** on the *Marker Menu* button
- In the **dropdown**, navigate to the Marker Styles menu definition using the following route
 - **Menu Definitions >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step 17 – Marker Style Menu**
- In the *Series Name* text box, give the series an appropriate name

Series Name:

Series Icon: Copy Hard-Space

Data Markers Advanced | Comments |

Marker Menu: (colours/shapes) #Beta Modules/IGM Rock Property Statistics Visualisation/@interface / Step 17 - Marker Style Menu Clear

Marker Menu: (sizes) Clear

Analysis Step I Continued – Adding Markers to PDF Chart

Open the PDF per Lithology (ticks + offset) Chart
Step I - PDF per Lithology (ticks + offset) Chart

PDF per Lithology

*Offset and Filtered using Distinct Lithology Table Ticks.

As before, **left click** on the *Configure Page* button
 In the *Configure page* **popup**:

- **Left click** on the *Series* tab
- In the *Series* tab, **left click** on the *Markers* tab
- **Tick** the *Marker Menu (colours/shapes)*
- **Left click** on the *Marker Menu* button
- In the **dropdown**, navigate to the Marker Styles menu definition using the following route
 - **Menu Definitions >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step 17 – Marker Style Menu**

In the *Series Name* text box, give the series an appropriate name

Series Name:
Series Icon: Copy Hard-Space

Data
Markers
Advanced
Comments

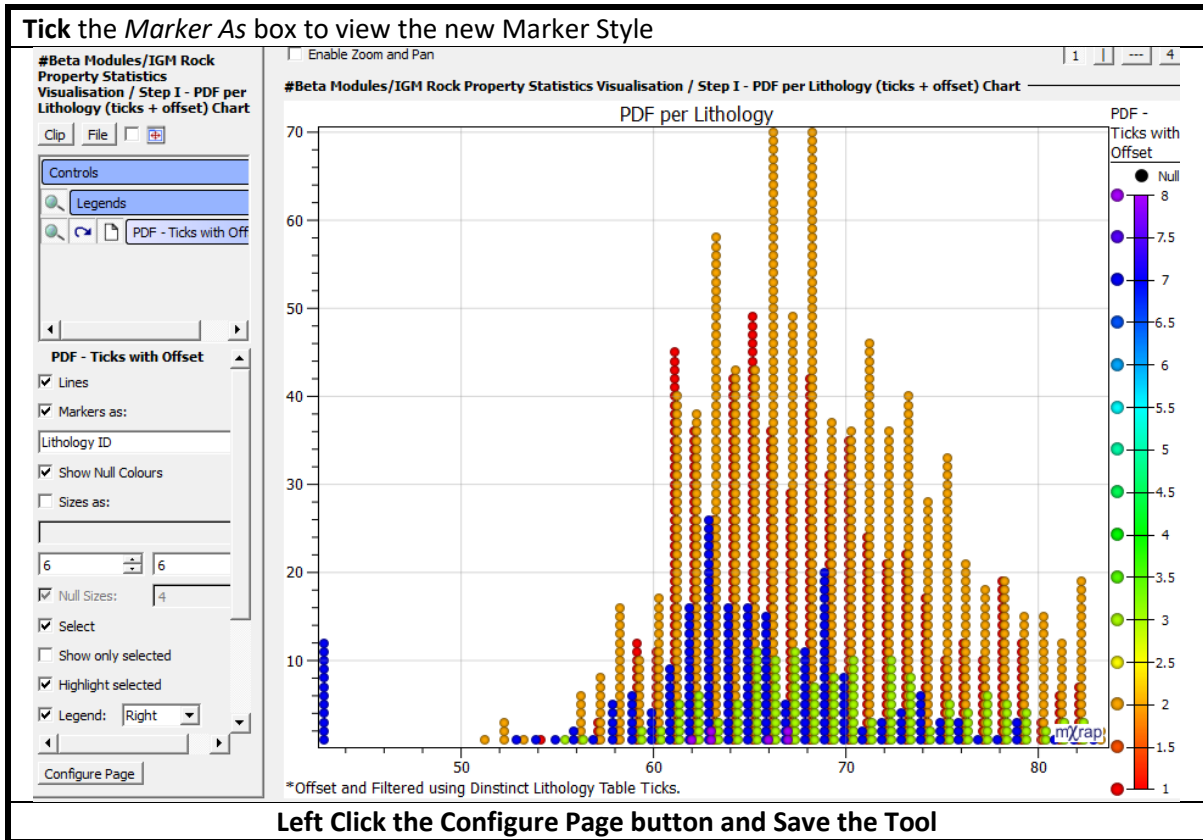
Marker Menu:
(colours/shapes)

Clear

Marker Menu:
(sizes)

Clear

Tick the *Marker As* box to view the new Marker Style



10. Applying Distinct Table Markers

Analysis Step B Continued – Adding Markers to Distinct Lithology Table

Open the Distinct Lithology Tableview	Step B – Distinct Lithology Tableview
--	--

#Beta Modules/IGM Rock Property Statistics Visualisation / Step B – Distinct Lithology Tableview

	↓ Lithology
1	<input checked="" type="checkbox"/> FAZ
2	<input checked="" type="checkbox"/> MZ
3	<input checked="" type="checkbox"/> NC1
4	<input checked="" type="checkbox"/> NC2
5	<input checked="" type="checkbox"/> PNZ
6	<input checked="" type="checkbox"/> T1
7	<input checked="" type="checkbox"/> T2L
8	<input checked="" type="checkbox"/> T2U

Left click on the *Configure Page* button
 In the *Configure page* **popup**:

- **Tick the *Marker Menu* box**
- In the *Marker Menu dropdown*, navigate to the Marker Menu created in Step 17 using the following route
 - **Menu Definitions >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step 17 – Marker Style Menu**

Show row/column headers as: labels (default) column sources (debugging)

Comments | Titles and Panel | Values Table | **Columns Table** | Appearance |

Show Columns table

Table: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology Table / Filter: * All Rows Id: #Beta Modules/IGM Rock Property Statistics Visualisation / Step 03 - Distinct Lithology Table / Lith_ID

Filter columns by name:

My category only Filter type:

Show ticked items only

Expand All | Collapse All

All Rows
* Home
#Beta Modules

Ticks

Tick column:

Tick value:

Marker Menu

#Beta Modules/IGM Rock Property Statistics Visualisation/@interface / Step 17 - Marker Style Menu

Clear

Revert to Saved | Delete | Save As

Clear Unused | Rename | Save | Apply | Cancel

Right click on the *Lithology* column heading and then left click on *Configure marker style*

#Beta Modules/IGM Rock Property Statistics Visualisation / Step B – Distinct Lithology Tableview

The screenshot shows a table with a 'Lithology' column header. A context menu is open over the header, listing options such as 'Invert sort', 'Use for Sort term 1', 'Use for Sort term 2', 'Use for Sort term 3', 'Don't sort with this column', 'Set label for this column', 'Configure data display format', 'Configure marker style', 'Hide columns', 'Show all hidden columns', 'Goto Source', 'Goto Source in New Tab', and 'Goto Source in New Window'. The 'Configure data display format' option is highlighted with a red box. A red arrow points from this option to the 'Colour cell background' radio button in the 'Set Column Markerstyle' dialog box. The dialog box also has a 'Marker Style' dropdown menu with 'Distinct Lithologies' selected and highlighted with a red box. Other options in the dialog include 'Do not use any styling', 'Show marker in cell', 'Show in legend' (unchecked), and a 'Right' dropdown menu. A 'Close' button is at the bottom right of the dialog.

The table should now look something like this

#Beta Modules/IGM Rock Property Statistics Visualisation / Step B – Distinct Lithology Tableview

	Lithology
1	FAZ
2	MZ
3	NC1
4	NC2
5	PNZ
6	T1
7	T2L
8	T2U

Left Click the Configure Page button and Save the Tool

Analysis Step F Continued – Adding Markers to Statistics per Lithology Tableview

	Lithology	Count	Maximum	Mean	Median	Minimum	Std Dev
* 1	FAZ	563	82	68.1929	67.4157	54	5.6621
2	MZ	850	83	68.7896	68	51.015	6.20261
3	NC1	137	82	70.0948	69.465	55.93	5.94919
4	NC2	6	66.091	64.1683	64.285	61.769	1.85303
5	PNZ	205	82	63.9555	64	42	7.64134
6	T1	241	82	64.8233	64	48.903	4.65614
7	T2L	86	82	67.857	68.038	56.113	5.71468
8	T2U	107	82	66.9825	66.14	54.566	5.64195

Left click on the *Configure Page* button
 In the *Configure page popup*:

- **Tick the *Marker Menu* box**
- In the *Marker Menu dropdown*, navigate to the Marker Menu created in Step 17 using the following route
 - **Menu Definitions >> #Beta Modules >> IGM Rock Property Statistics Visualisation >> Step 17 – Marker Style Menu**

Right click on the *Lithology* column heading and then left click on *Configure marker style*

#Beta Modules/IGM Rock Property Statistics Visualisation / Step F - Statistics per Lithology Tableview

	↓ Lithology	Count	Maximum	Mean	Median	Minimum	Std Dev
* 1	FAZ	563	82	68.1929	67.4157	54	5.6621
2	MZ	850	83	68.7896	68	51.015	6.20261
3	NC1	137	82	70.0948	69.465	55.93	5.94919
4	NC2	6	66.091	64.1683	64.285	61.769	1.85303
5	PNZ	205	82	63.9555	64	42	7.64134
6	T1	241	82	64.8233	64	48.903	4.65614
7	T2L	86	82	67.857	68.038	56.113	5.71468
8	T2U	107	82	66.9825	66.14	54.566	5.64195

Context menu options for Lithology:

- Invert sort
- Use for Sort term 1
- Use for Sort term 2
- Use for Sort term 3
- Don't sort with this column
- Set label for this column
- Configure data display format
- Configure marker style**
- Hide columns
- Show all hidden columns
- Goto Source
- Goto Source in New Tab
- Goto Source in New Window

Set Column Markerstyle dialog:

Set format for: Lithology

- Do not use any styling
- Colour cell background
- Show marker in cell

Marker Style: **Distinct Lithologies**

Show in legend Right

Close

The table should now look something like this

#Beta Modules/IGM Rock Property Statistics Visualisation / Step F - Statistics per Lithology Tableview

	↓ Lithology	Count	Maximum	Mean	Median	Minimum	Std Dev
* 1	FAZ	563	82	68.1929	67.4157	54	5.6621
2	MZ	850	83	68.7896	68	51.015	6.20261
3	NC1	137	82	70.0948	69.465	55.93	5.94919
4	NC2	6	66.091	64.1683	64.285	61.769	1.85303
5	PNZ	205	82	63.9555	64	42	7.64134
6	T1	241	82	64.8233	64	48.903	4.65614
7	T2L	86	82	67.857	68.038	56.113	5.71468
8	T2U	107	82	66.9825	66.14	54.566	5.64195

Left Click the Configure Page button and Save the Tool

11.Application

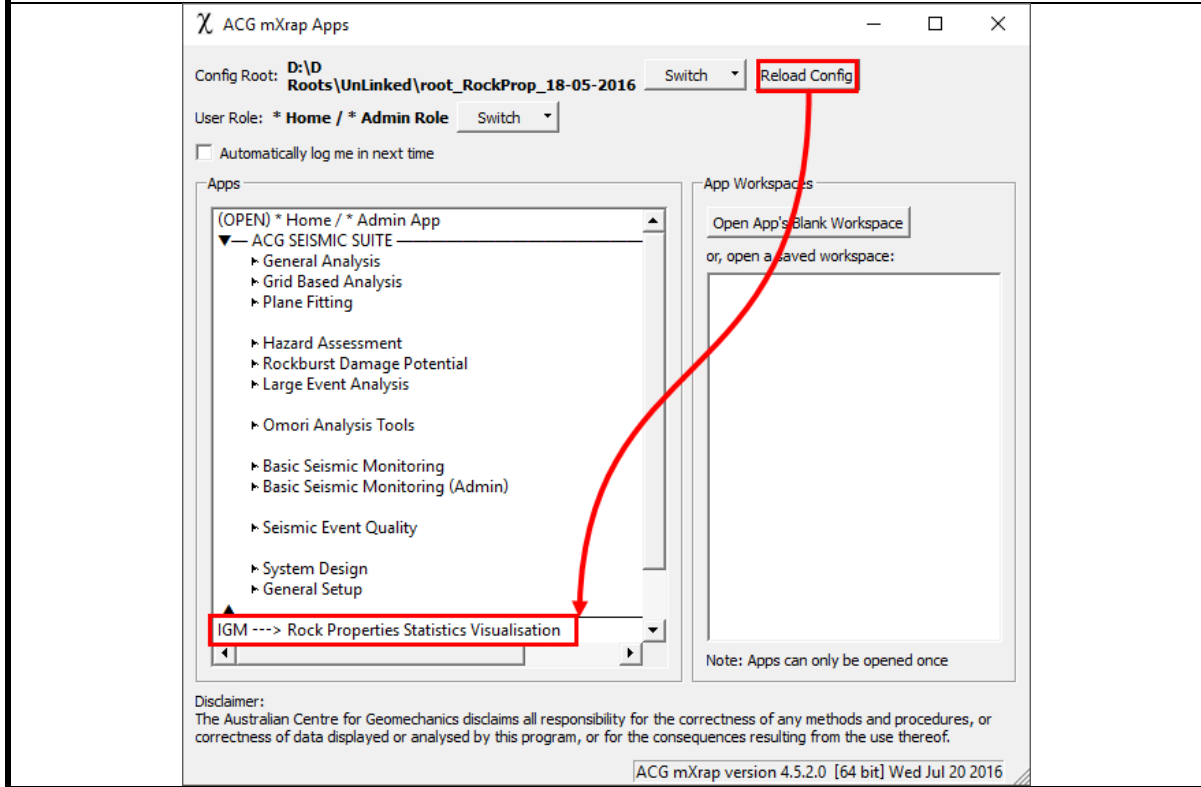
Launching your App

Once the app has been built, it should appear in the mXrap launcher.

In the Launcher, **left click** Reload Config to refresh the Launcher

The app should now appear under the correct root under the Home/Admin Role

Double left click to open your newly created app



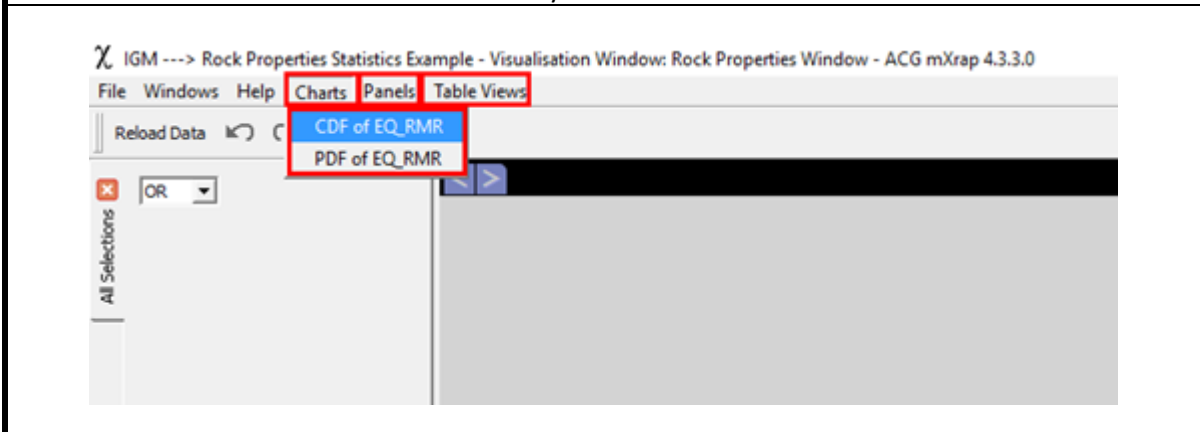
Selecting what you want to see in your App

The user can open the various charts and table views in tabs within the app workspace. The panels created can also be opened and should display to the left of the workspace.

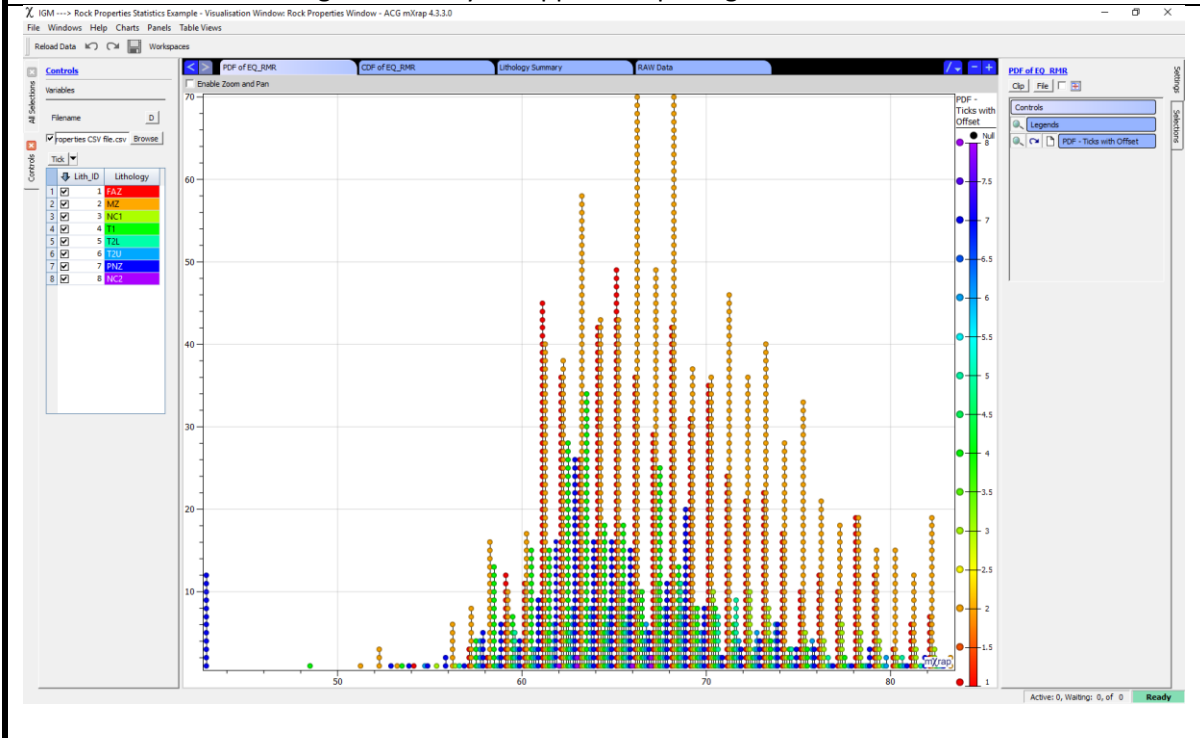
The charts, table views and variables panels created under the @interface will now be accessible in your app

In the App menu

- Charts – Select the charts you want to view
- Panels – Select the panels you want to view
- Table views – Select the table views you want to view



You should see something like this in your app after opening a few tools

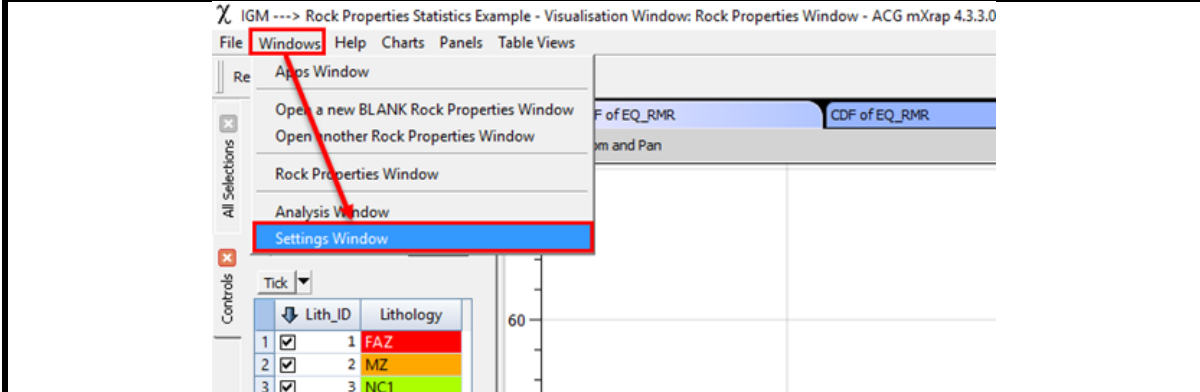


Saving the opened tabs so they appear every time the app is opened

The tabs opened by the user can be saved, allowing for the blank workspace to be configured as required.

In the App Menu:

- Click Windows and go to Settings Window



In the Settings Window:

Open the *Analysis Window Menu Definition* tool created in Step 19

Left click the *Initial Tabs* tab to open it

Tick the “Enable initial tabs capture”.

Now go back to the App window. In the App Menu:

Left click File and then click Capture Initial Tabs

Go back to the Settings Window with the tool created in Step 19 still open. Save the tool.

Your app will now open the same tabs that you’ve just saved every time you open the app.

