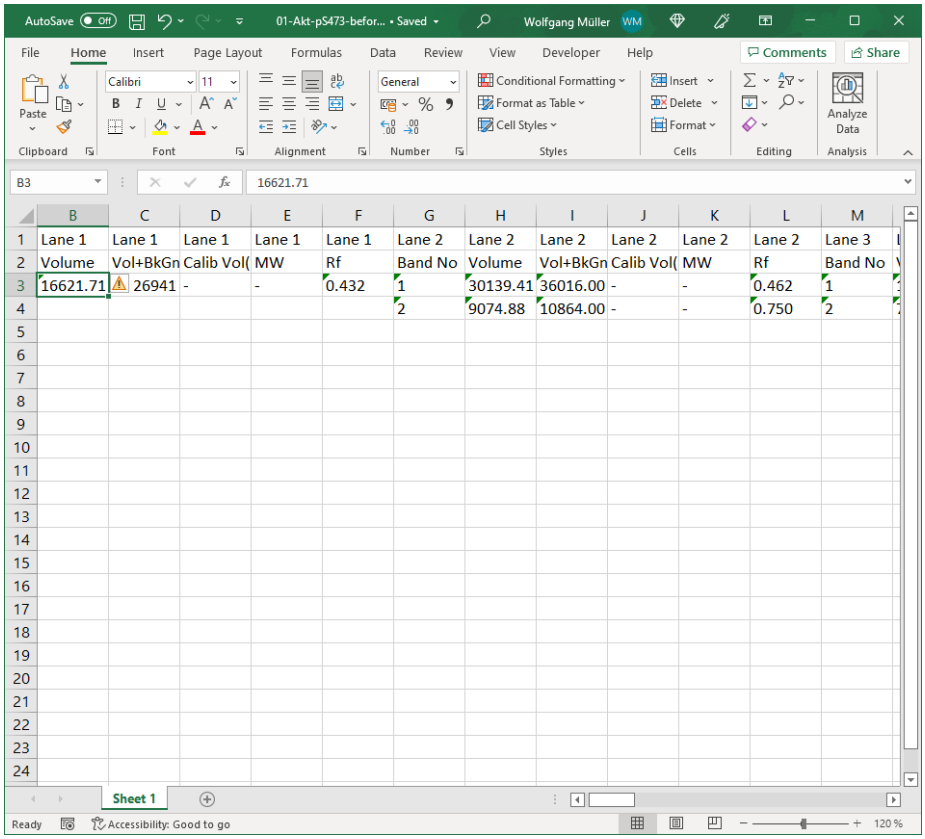
SOP for using 'ReStoRunT' Copy and Transformer Sheets

What are we going to do in this document?

We are describing the ReStoRunT mechanism. ReStoRunT is about **Rec**ording & **Sto**ring transformations, with the ability to to then **Run** them on other data and keep a **T**race of what happened. To this end we will take some data, and create a ReStoRunT CopySheet(S) that creates a copy of the data in a sheet S by referencing each cell of the original sheet. Applying transformations to the CopySheet will then yield a TransformationSheet(S) that can be used to transform the content of any other sheet behold, real data from Cecilia Barile's work:

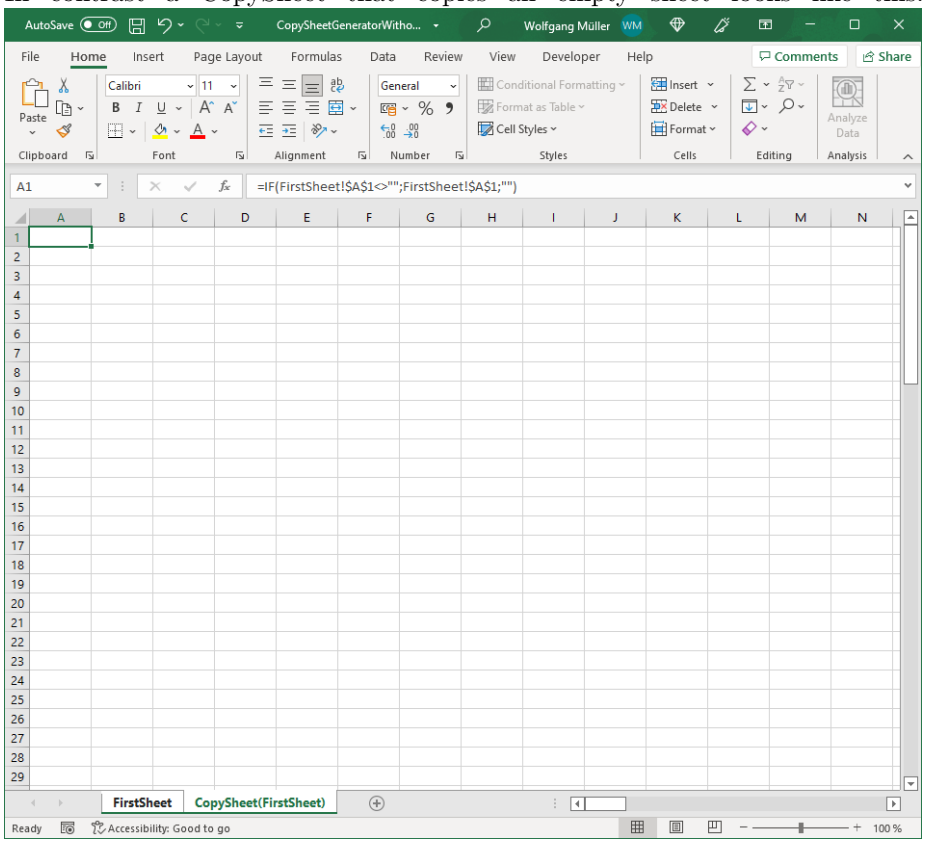


	B	C	D	E	F	G	H	I	J	K	L	M
1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 2	Lane 2	Lane 2	Lane 2	Lane 2	Lane 2	Lane 3
2	Volume	Vol+BkGn	Calib Vol(	MW	Rf	Band No	Volume	Vol+BkGn	Calib Vol(	MW	Rf	Band No
3	16621.71	26941	-	-	0.432	1	30139.41	36016.00	-	-	0.462	1
4						2	9074.88	10864.00	-	-	0.750	2

Figure 1: Original file

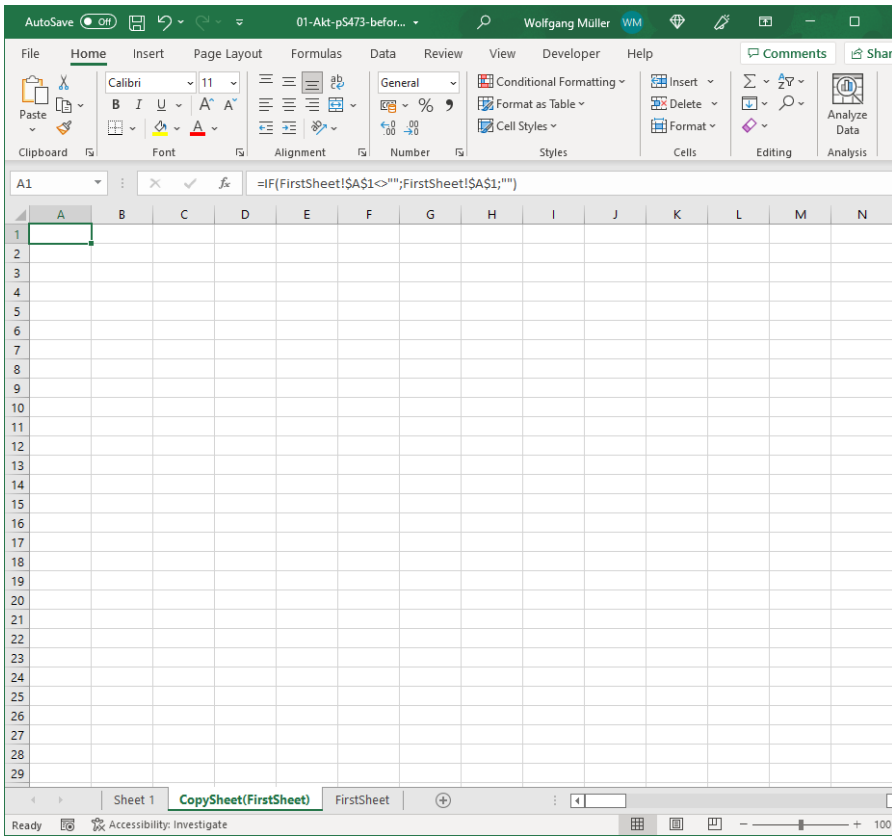
Inserting a CopySheet into the original workbook, then attaching the sheet via Search&Replace

In contrast a CopySheet that copies an empty sheet looks like this:



Very empty. However, in the formula line you can see the expressions making up the sheet. If you are interested in what happens: `FirstSheet!$A$1` is the cell `A1` in the sheet `FirstSheet`, and the `IF` avoids us seeing lots of zeros instead of the empty sheet.

Now, take the tabs `FirstSheet` and `CopySheet(FirstSheet)` **both at the same time** and move them **at the same time** into the previously shown work-

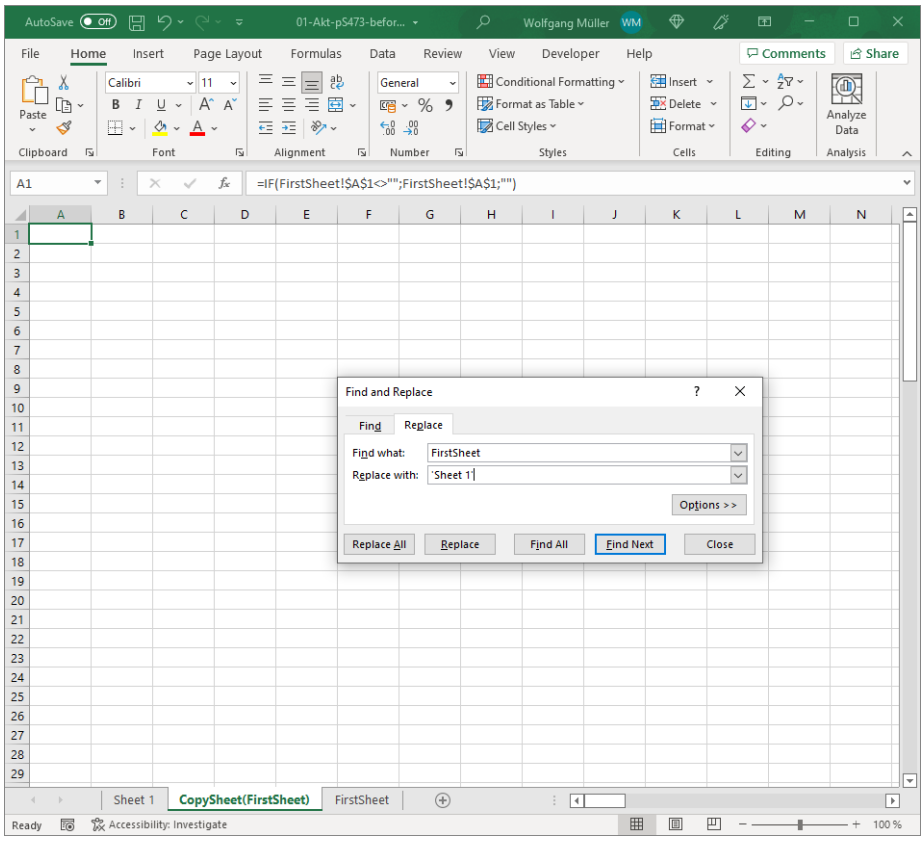


book. You will get this workbook:

Most likely, you also got a message telling you that the original workbook that contained the two tabs that you moved will be closed without saving. This is exactly what we want, the copy sheet is ready for its next use.

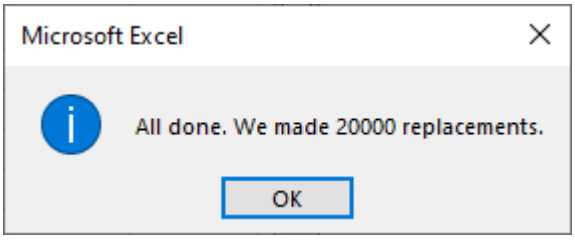
Now, the `CopySheet(FirstSheet)` still references cells in FirstSheet. As a result, you do not see anything useful. We have to change that, and we do so via a simply

search and replace:



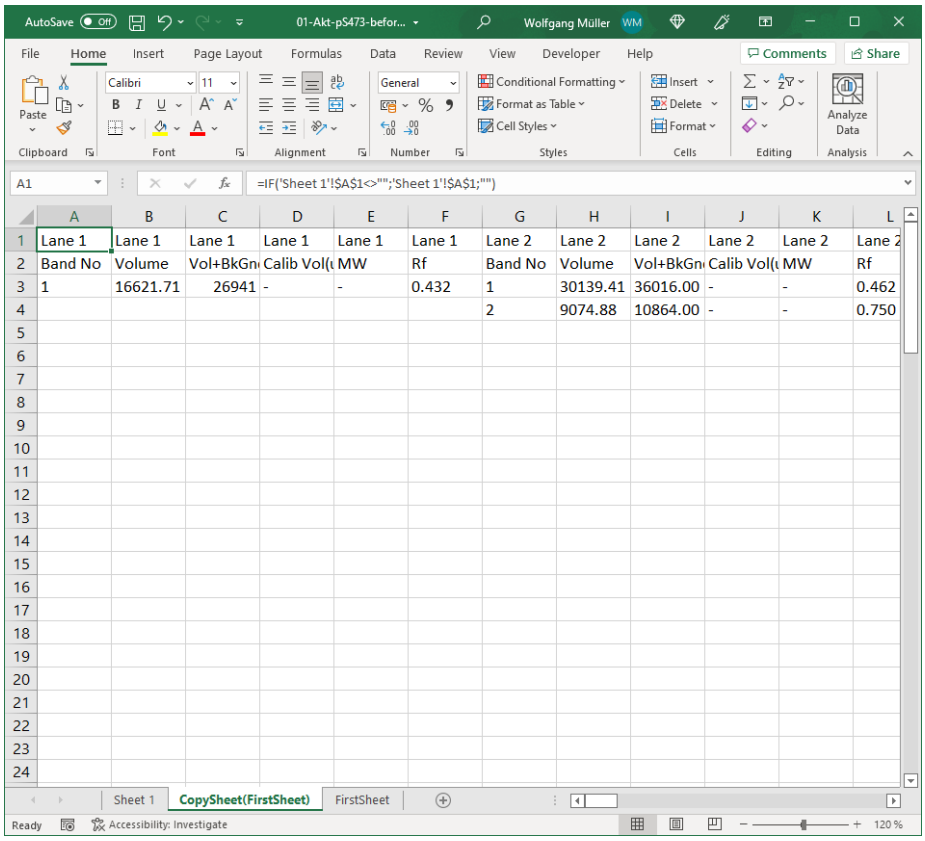
Instead of the `FirstSheet`, we want to reference `Sheet 1`. As there is a space in the name `Sheet 1`, we have to **replace** `FirstSheet` by `'Sheet 1'` **in all cells*. Please note the single quotes. We call this **attaching** the CopySheet to the desired sheet.

Now, if we are succesful, we first get told:



Why 20000? We made the copy sheet 100x100 cells of size. Each cell accounts for 2 replacements. 100x100 seems to us a good compromise for the data ReStoRunT was devised for. However, bigger and smaller sheets are always possible.

Otherwise, things look very much as before! The CopySheet copies!



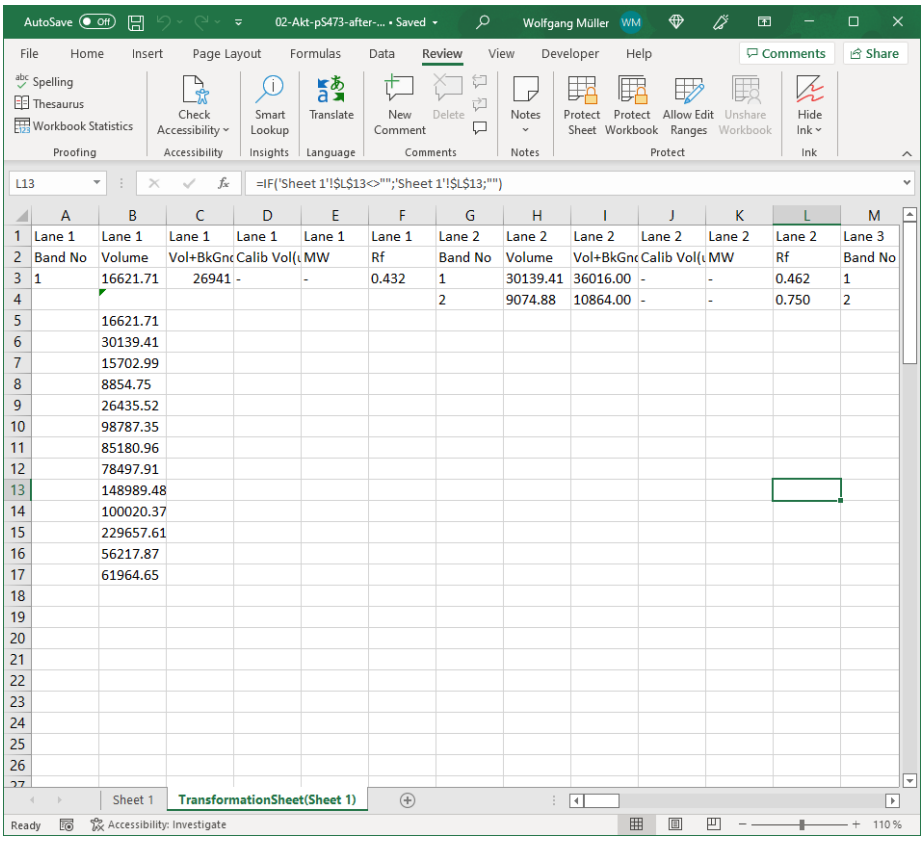
	A	B	C	D	E	F	G	H	I	J	K	L
1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 2	Lane 2	Lane 2	Lane 2	Lane 2	Lane 2
2	Band No	Volume	Vol+BkGn	Calib Vol(	MW	Rf	Band No	Volume	Vol+BkGn	Calib Vol(	MW	Rf
3	1	16621.71	26941	-	-	0.432	1	30139.41	36016.00	-	-	0.462
4							2	9074.88	10864.00	-	-	0.750

As an aside, I did not rename the ***`CopySheet(FirstSheet)`****, I did not delete* ***`FirstSheet`****, as I wanted to make clear which sheet is which and wanted to make it easier to follow between screenshots. However, in real life you should rename sheets to what they are and what they mean as a measure of keeping track.*

From CopySheet to TransformationSheet

Now, apply your transformations to the `CopySheet`. The transformations that I mean is cutting and pasting cells in the copy sheet in order to obtain another arrangement of data within the sheet. In our example, we get this result after cut

and paste:

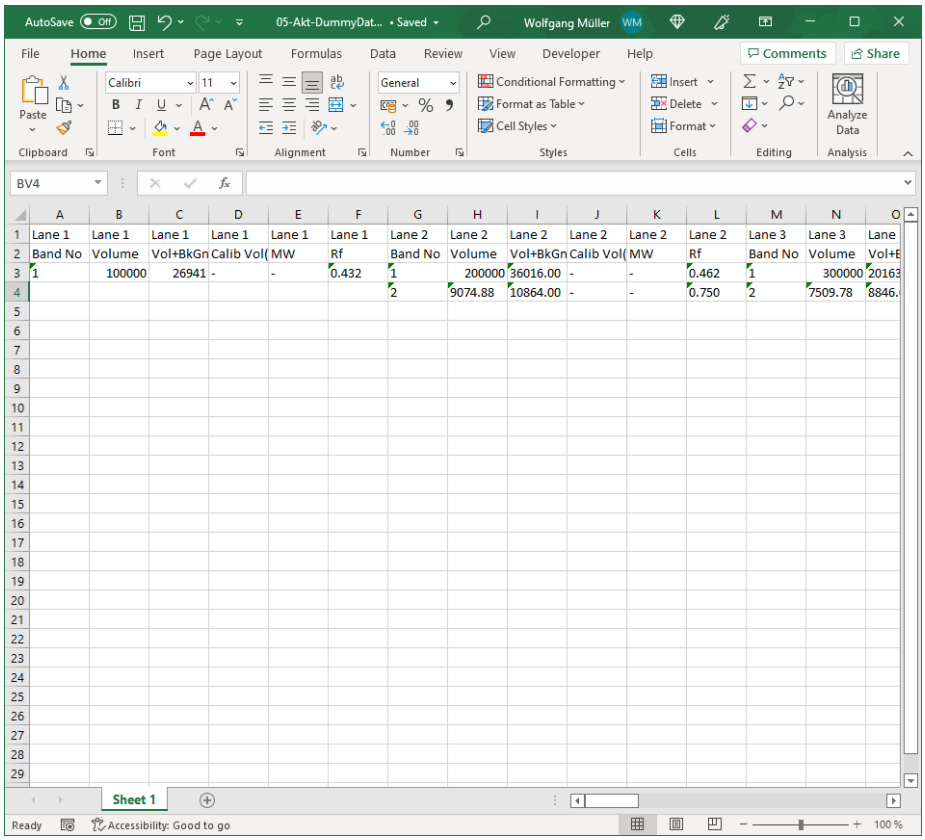


	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 2	Lane 2	Lane 2	Lane 2	Lane 2	Lane 2	Lane 3
2	Band No	Volume	Vol+BkGnc	Calib Vol(u	MW	Rf	Band No	Volume	Vol+BkGnc	Calib Vol(u	MW	Rf	Band No
3	1	16621.71	26941	-	-	0.432	1	30139.41	36016.00	-	-	0.462	1
4							2	9074.88	10864.00	-	-	0.750	2
5		16621.71											
6		30139.41											
7		15702.99											
8		8854.75											
9		26435.52											
10		98787.35											
11		85180.96											
12		78497.91											
13		148989.48											
14		100020.37											
15		229657.61											
16		56217.87											
17		61964.65											

This now looks exactly as what we did before. Also in terms of work, this was exactly what we did before. But there is an important difference. We can call this sheet a TransformationSheet. And we rename it as such.

Using the TransformationSheet: Copy and Attach

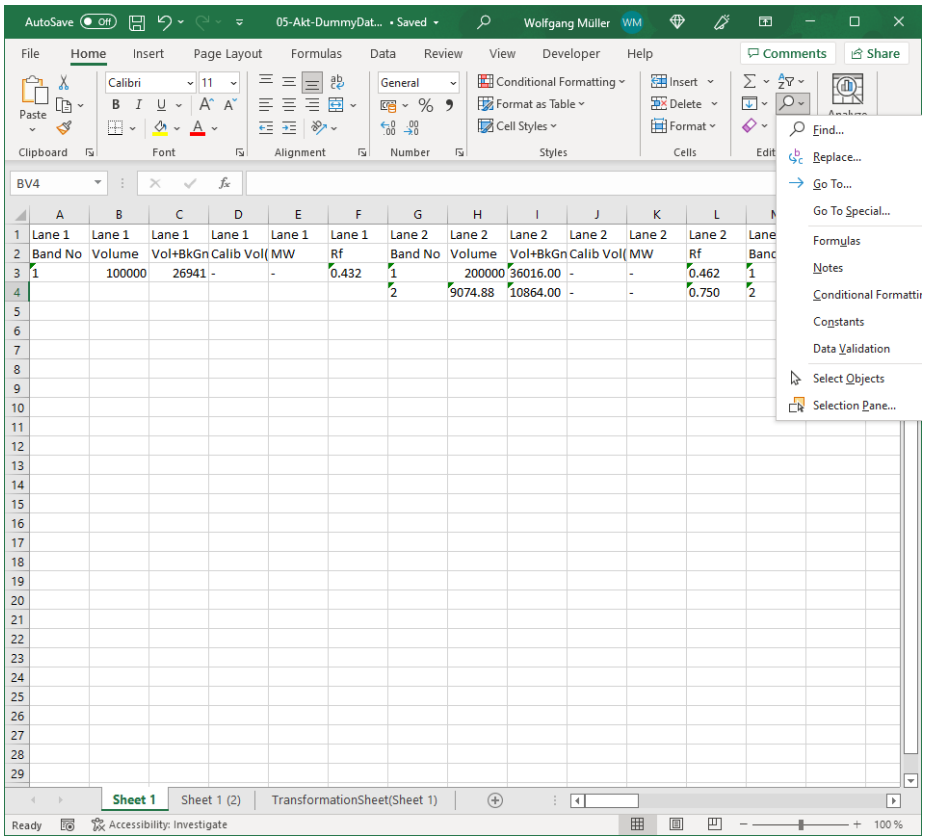
Now, please consider this demo workbook that contains data fabricated with the purpose of demonstration. It was obtained by replacing the `volume` cells in the original sheet by the numbers `100000` through `1300000`. All the rest, including the structure, stayed the same.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 2	Lane 2	Lane 2	Lane 2	Lane 2	Lane 2	Lane 3	Lane 3	Lane
2	Band No	Volume	Vol+BkGn	Calib Vol(	MW	Rf	Band No	Volume	Vol+BkGn	Calib Vol(	MW	Rf	Band No	Volume	Vol+E
3	1	100000	26941	-	-	0.432	1	200000	36016.00	-	-	0.462	1	300000	20163
4							2	9074.88	10864.00	-	-	0.750	2	7509.78	8846.

We will now **apply** the TransformationSheet generated in the previous section

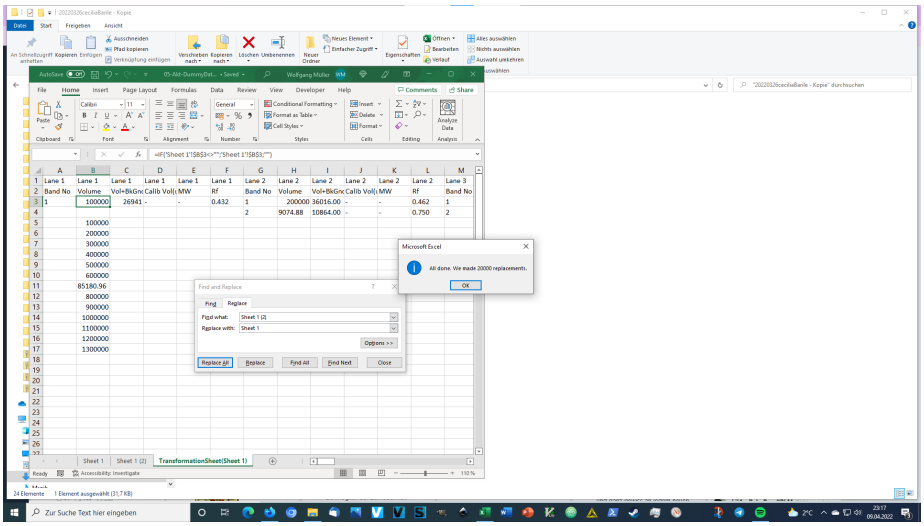
How does applying the sheet work? We start out with both workbooks, the transformer workbook containing the TransformationSheet we just generated and the demo workbook, again we move both the `Sheet 1` and the `TransformationSheet(Sheet 1)`:



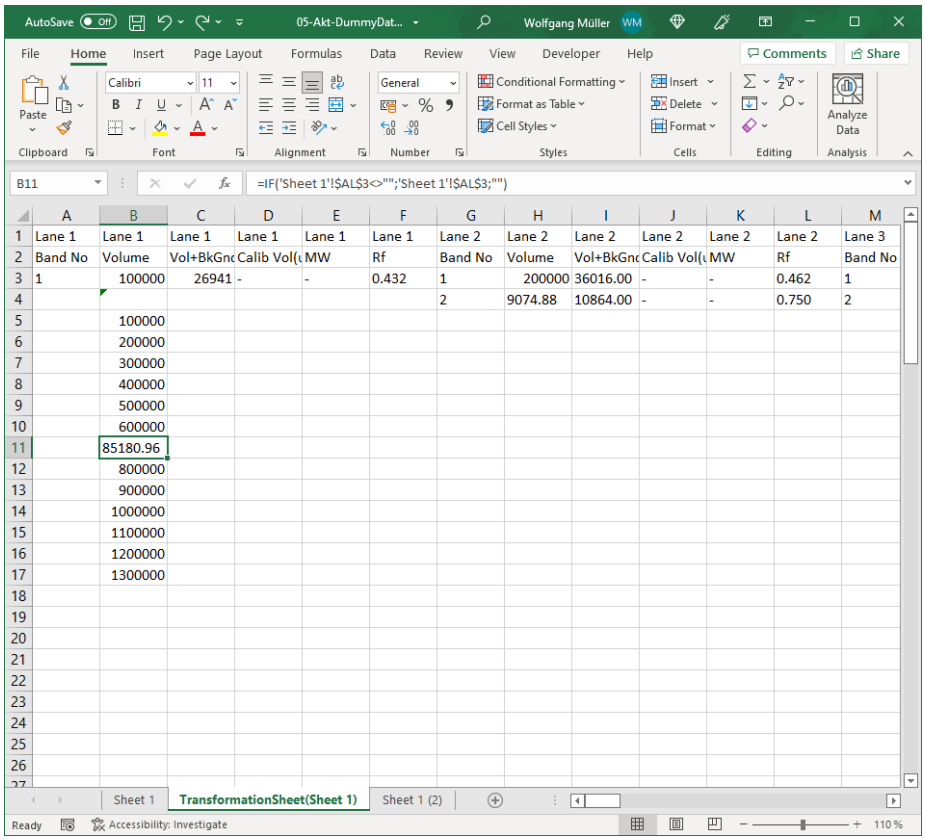
	A	B	C	D	E	F	G	H	I	J	K	L
1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 2	Lane 2	Lane 2	Lane 2	Lane 2	Lane 2
2	Band No	Volume	Vol+BkGn	Calib Vol(	MW	Rf	Band No	Volume	Vol+BkGn	Calib Vol(	MW	Rf
3	1	100000	26941	-	-	0.432	1	200000	36016.00	-	-	0.462
4							2	9074.88	10864.00	-	-	0.750

Small complication: "Sheet 1" out of the Transformer Workbook just changed name and became `Sheet 1 (2)`. So now, we have to go to the `TransformationSheet(Sheet 1)` and replace all occurences of `Sheet 1 (2)` by `Sheet 1`.

And then? Voilà! The TransformerSheet transforms our demo data!

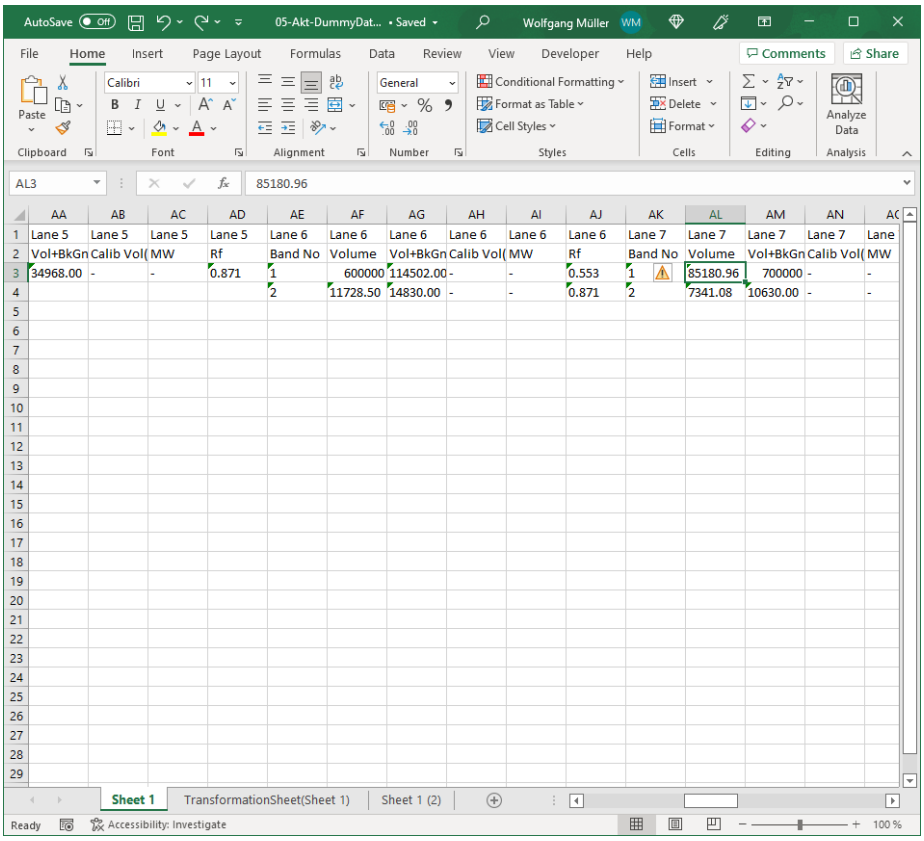


And if you are looking closely at the screenshot, you will see that in preparing the demo data, one cell was inadvertently skipped. When looking at the cell in the transformation sheet, we can see that its value came from cell `'Sheet 1'!$AL$3`:



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 2	Lane 2	Lane 2	Lane 2	Lane 2	Lane 2	Lane 3
2	Band No	Volume	Vol+BkGnd	Calib Vol(u	MW	Rf	Band No	Volume	Vol+BkGnd	Calib Vol(u	MW	Rf	Band No
3	1	100000	26941	-	-	0.432	1	200000	36016.00	-	-	0.462	1
4							2	9074.88	10864.00	-	-	0.750	2
5		100000											
6		200000											
7		300000											
8		400000											
9		500000											
10		600000											
11		85180.96											
12		800000											
13		900000											
14		1000000											
15		1100000											
16		1200000											
17		1300000											
18													
19													
20													
21													
22													
23													
24													
25													
26													

Now, let us look there:



	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AC
1	Lane 5	Lane 5	Lane 5	Lane 5	Lane 6	Lane 6	Lane 6	Lane 6	Lane 6	Lane 6	Lane 7	Lane 7	Lane 7	Lane 7	Lane
2	Vol+BkGn	Calib Vol(	MW	Rf	Band No	Volume	Vol+BkGn	Calib Vol(	MW	Rf	Band No	Volume	Vol+BkGn	Calib Vol(	MW
3	34968.00	-	-	0.871	1	600000	114502.00	-	-	0.553	1	85180.96	700000	-	-
4					2	11728.50	14830.00	-	-	0.871	2	7341.08	10630.00	-	-

And really, during preparation of the data we skipped one cell. The automation, and this type of searching if everything is OK is exactly what ReStoRunT is about.

Thanks for reading, lots of fun trying it out, and hopefully much time saved!