Excel 365: The Subtle Art of Overcomplicating LAMBDAs

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London Excel Meetup - 18/06/2024

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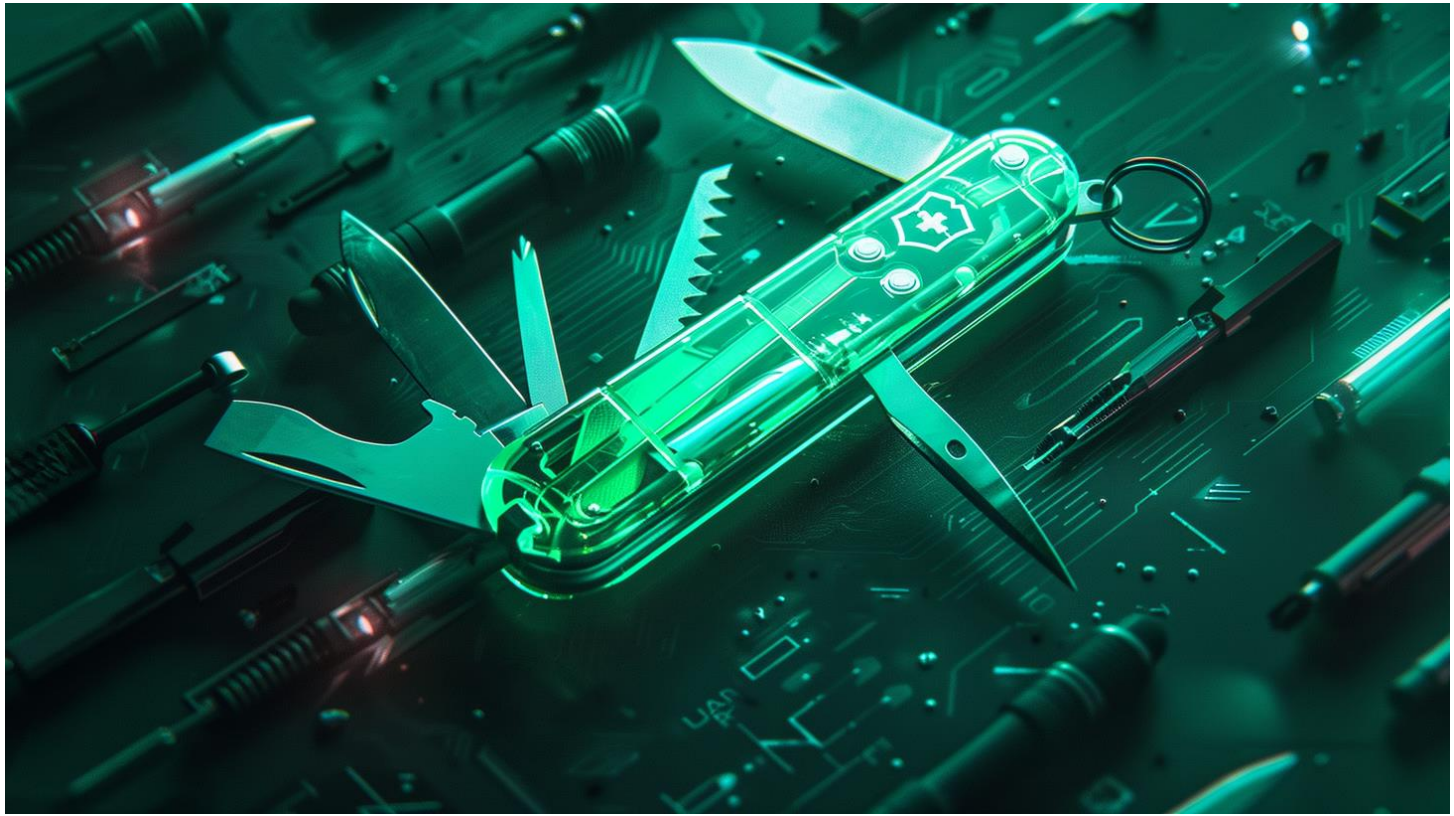
Main topics of tonight

> **LAMBDAs**: a brief introduction

> **LAMBDAs in real life**: how to craft a complex LAMBDA from scratch

> **Q&A:** or - why are you all so passionate about this topic?

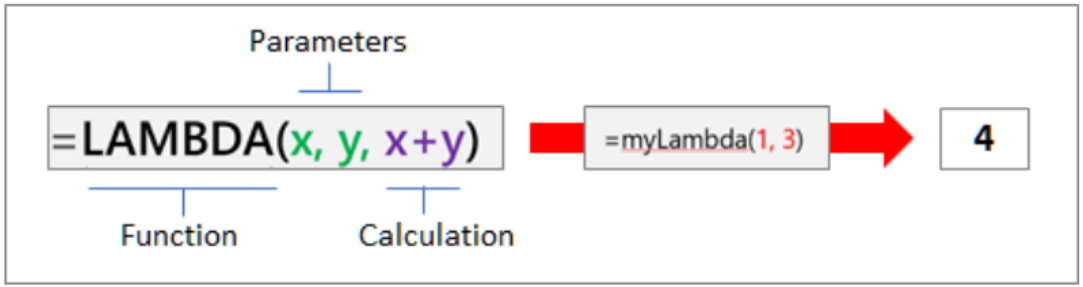
LAMBDAs



LAMBDAs

Use a LAMBDA function to create custom, reusable functions and call them by a friendly name. The new function is available throughout the workbook and called like native Excel functions.

You can create a function for a commonly used formula, eliminate the need to copy and paste this formula (which can be error-prone), and effectively add your own functions to the native Excel function library. Furthermore, a LAMBDA function doesn't require VBA, macros or JavaScript, so non-programmers can also benefit from its use.



Examples

=**TOPX**() > you obtain the topX values of a certain range

=**GROSS_MARGIN**() > you calculate GM from sales and costs

=**LOAN**() > you calculate a full loan amortization schedule in 1 go

=**INSET_PLOT**() > you create the perfect start for a plot chart

=**WORDS.DELETE**() > you delete words from a certain string

To LAMBDA - or not to LAMBDA

Meet Luca - a good friend of mine

"You are creating a LAMBDA?

What's your problem, my friend?

Why would
any sane person
create
such
a monstrosity?!"

Meet Paolo - another good friend of mine

"A LAMBDA about inset plots?

I do not think they have
a proper translation in Italian.

Anyway, I do not think that anybody cares about those charts outside of academia"

Luca, Paolo, and the typical reaction to LAMBDA

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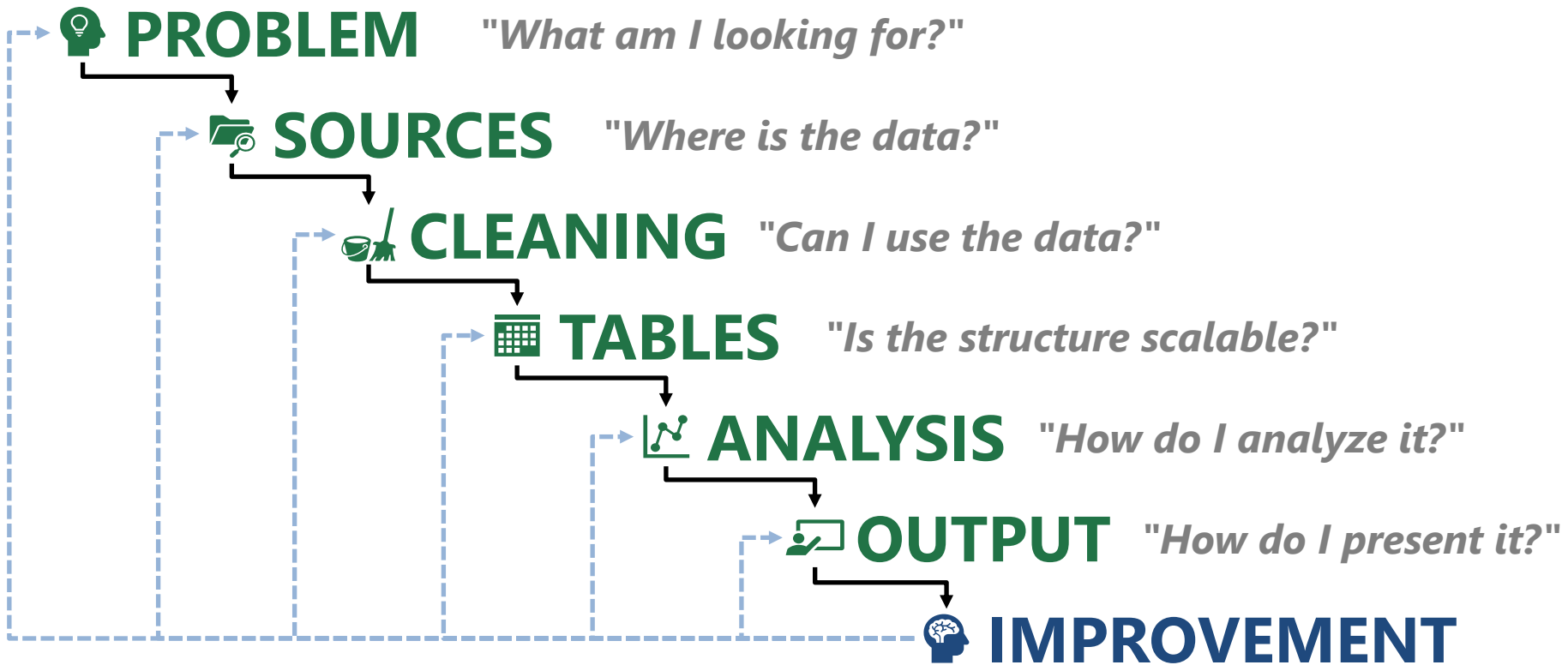
To LAMBDA - or not to LAMBDA

How to work efficiently in Excel



Why LAMBDAs differ so much

Various factors are at stake:

How you **think**.

How much you **know about Excel**.

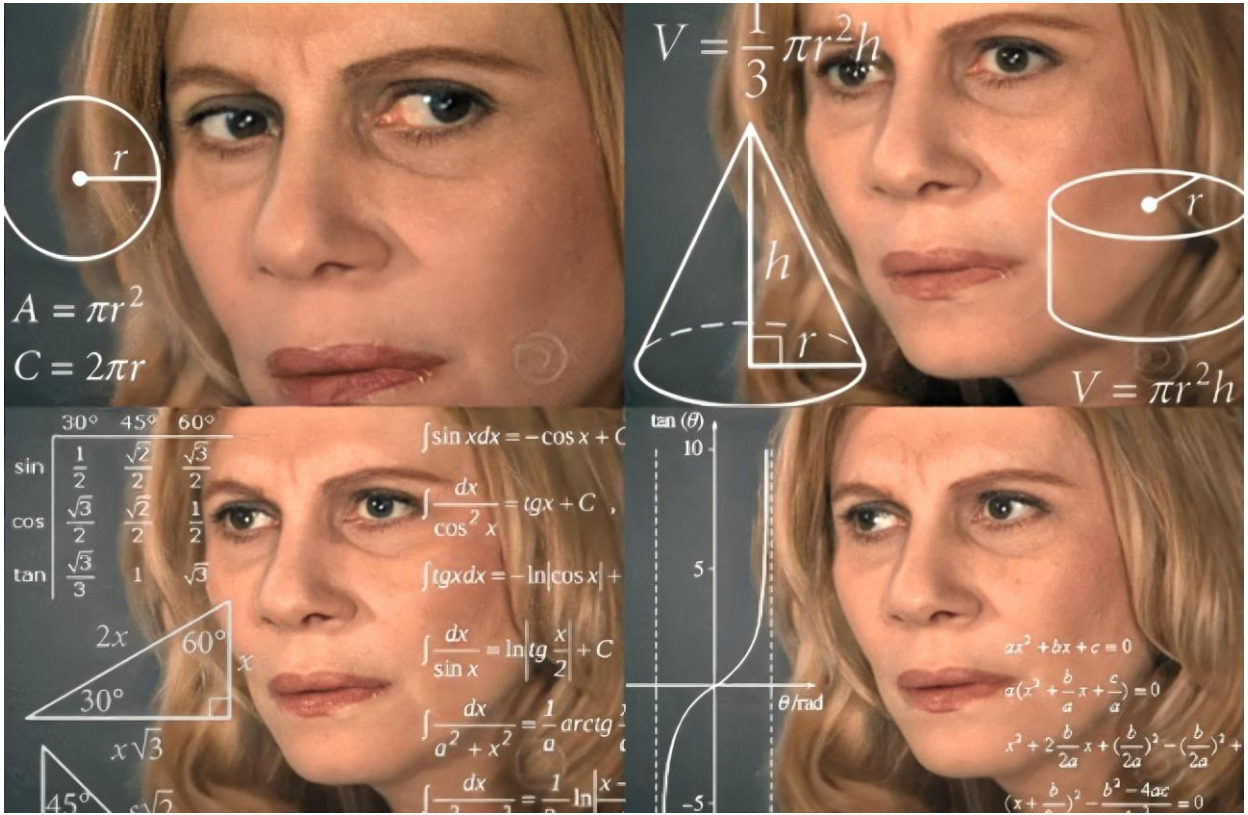
How you **collaborate** with your stakeholders.

How often you will **need a similar solution.**

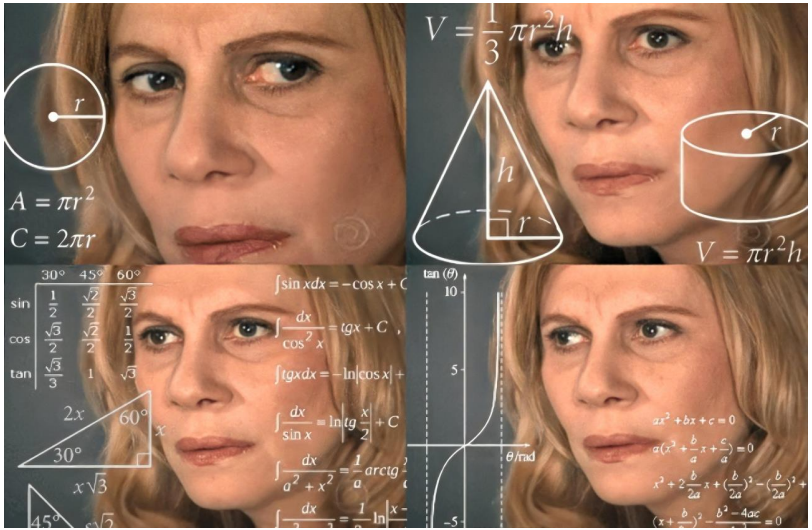
The love / hate relationship with LAMBDAs

My reaction to my LAMBDAs

My reaction to other LAMBDAs

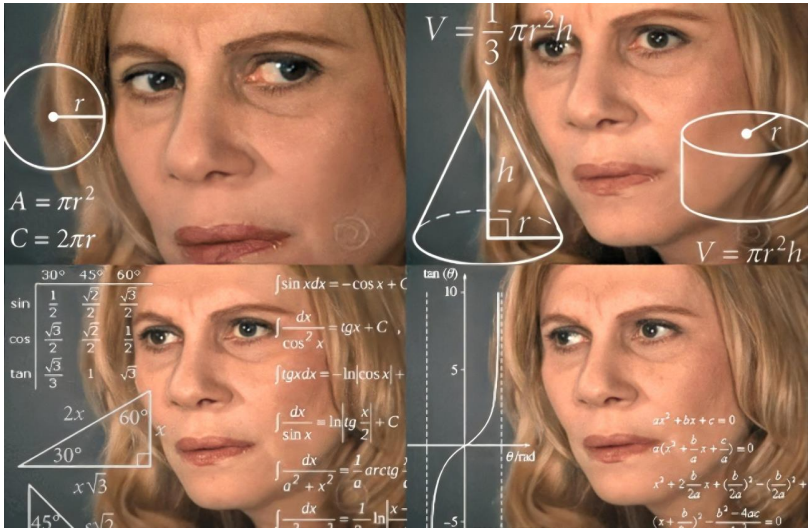


Different experiences, different LAMBDAs



The truth about LAMBDAs

The end user matters more than your tech proficiency



Overcomplicating LAMBDAs

LAMBDAs do not need to be the edge of what Excel has to offer.

LAMBDAs may be as **easy as dividing two numbers (gross margin)**.

Companies would benefit from a **pre-definite set of LAMBDAs** calculating the most relevant **KPIs** in one go instead of looking to increase tech proficiency of their users.

However, **this is not happening - for now**.

Overcomplicating LAMBDAs #2

LAMBDAs do not need to account for every scenario.

It's okay if **they are not perfect**.

There is **always space to improve**.

What happens - and how not to be discouraged

LAMBDAs can be overwhelming.

Probably, there is a **better way to reach your solution**.

There is nothing bad with it.

Embrace the change.

Lead by example.

How to make any creator feel **bad**

"I thought about this problem and created this LAMBDA".

First comment:

How to make any creator feel **bad**

"I thought about this problem and created this LAMBDA".

First comment:

How to make any creator feel **good**

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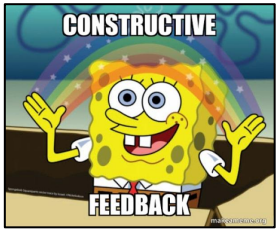
First comment:

How to make any creator feel **good**

"I thought about this problem and created this LAMBDA".

First comment:

Then, maybe, if you really bring something to the table:



The case for using LAMBDAs

LAMBDAs will skyrocket your overall Excel knowledge, regardless of your level.

They help to think about **problems strategically.**

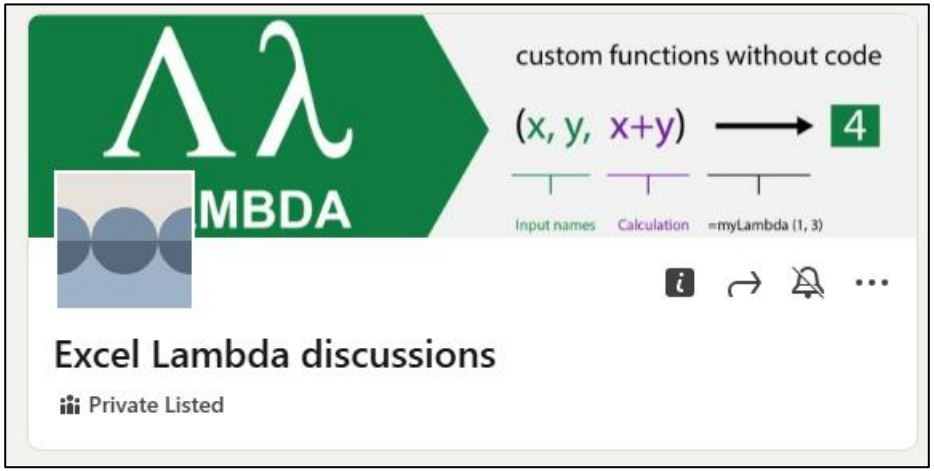
They help to reduce **repetitions in formulas.**

They help to discover **innovative ways on how to use functions.**

Scaled at company level, **they may become invaluable.**

The community around LAMBDAs

Excel LAMBDA Discussions > [Excel Lambda discussions | Groups | LinkedIn]



I **highly recommend you all to join** his amazing, tight-knit group!

MEGAREPLACE

Using LAMBDAs

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Thought Process

"I hate these **long lists of SUBSTITUTE** to change values.

I am convinced I can use LAMBDAs to simplify the process."

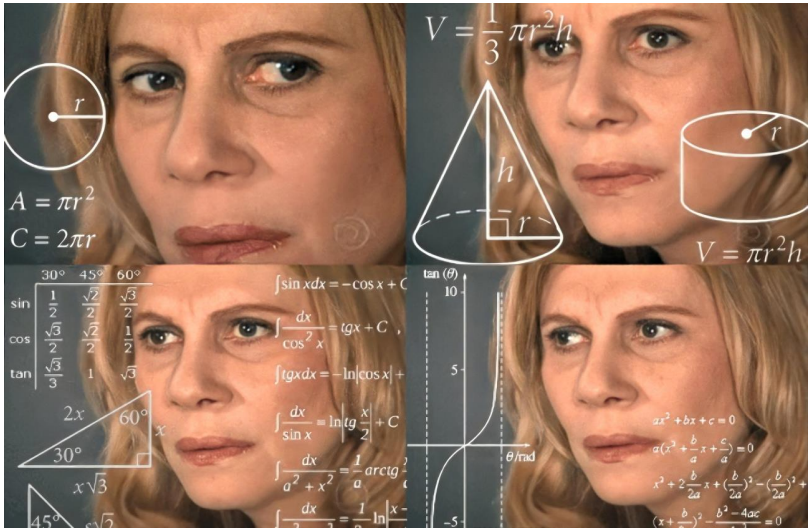
Overcomplicating what's simple

"How would I approach this without LAMBDAs?

Isn't Power Query perfect for such a job?"

Reminder

The end user matters more than your tech proficiency



Functions we are going to use

LET

REDUCE

SEQUENCE

ROWS

LAMBDA

SUBSTITUTE

INDEX

CONCAT

What we want the user to insert

- The **range of words** we want to modify

- A **list of words** to be substituted (old)

- A **list of words** to be used as substitutes (new)

Overall:

- 1 **table** with the **words**
- 1 **table** with **substitutes**: old | new

Thought Process

"We work **recursively**, checking one string after the other vs the text. If **there is a match** on the table, I want **SUBSTITUTE** to intervene. Otherwise, I want to **retrieve the text exactly as entered**"

What the user should insert

The user will have to define 3 parameters:

- Where the **words are**
- Where the **words_to_replace are**
- Where the **new_words are**

=LET(
*start, **TBL,***
*words_to_replace, **TBL_REF[OLD]**,*
*new_words, **TBL_REF[NEW],***

The magic of REDUCE

```
reduced_text, REDUCE(
        start,
        SEQUENCE(ROWS(words_to_replace)),
        LAMBDA(accumulator,v,
            SUBSTITUTE(accumulator,
            INDEX(words_to_replace, v),
            INDEX(new_words, v)))),
```

The magic of REDUCE

```
reduced_text, REDUCE(
        start,
        SEQUENCE(ROWS(words_to_replace)),
        LAMBDA(accumulator,v,
            SUBSTITUTE(accumulator,
            INDEX(words_to_replace, v),
            INDEX(new_words, v)))),
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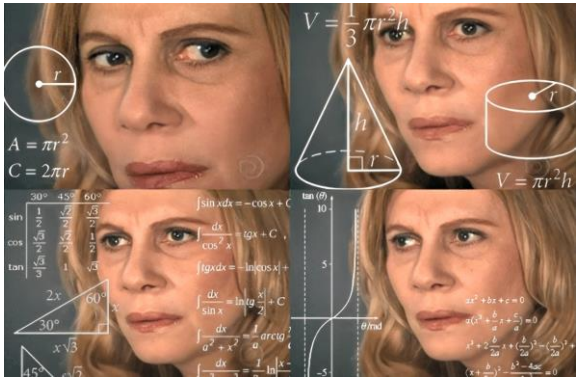

The formula starts from the **range of words (original_text)**.

Then, it check **how many words (SEQ) we have in the second table.**

To conclude, it substitutes (**LAMBDA**) all words looking at their own relative position in the table set up by the user, iteratively.

My LAMBDA (starting point)

```
=LET(
    start, TBL,
    words_to_replace, TBL_REF[OLD],
    new_words, TBL_REF[NEW],
    reduced_text, REDUCE(
        start,
        SEQUENCE(ROWS(words_to_replace)),
        LAMBDA(accumulator,v,
            SUBSTITUTE(accumulator, INDEX(words_to_replace, v), INDEX(new_words, v)))),
    reduced_text
)
```

My LAMBDA (final)

=**LAMBDA**(start,words_to_replace,new_words,

LET(reduced_text,
REDUCE(start,
SEQUENCE(**ROWS**(words_to_replace)),
LAMBDA(accumulator,value,
SUBSTITUTE(accumulator,**INDEX**(words_to_replace,value),**INDEX**(new_words,value)))),
reduced_text))

What the user should insert

The user will have to define 3 parameters:

- Where the **words are**
- Where the **words_to_replace are**
- Where the **new_words are**

```
=LET(
   start, TBL,
   words_to_replace, TBL_REF[OLD],
   new_words, TBL_REF[NEW],
```

It works!

A potential variation

"What about **showing both** the words_to_replace and the new_words?"

MEGAREPLACE #2

Using LAMBDAs

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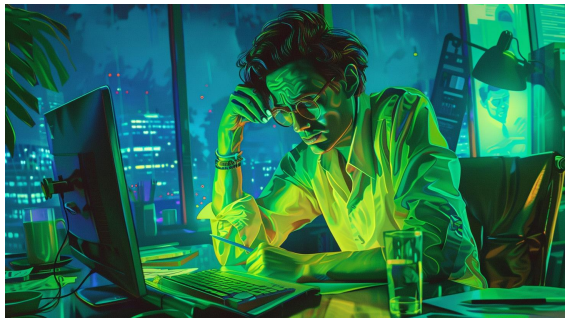
Overcomplicating LAMBDAs

"I am checking **combinations of strings, not words**.

Should I account for this?"

The Charleston is a dance named after the city of Charleston, SC



Reusing concepts

"**I created, in the past, a LAMBDA to split all words in a cell**.

Maybe I can borrow the idea from that LAMBDA"

EXPLODING_CELLS

Using LAMBDAs

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How to split all words inserted in a cell

```
=LET(range,
  DROP(
        IFERROR(
                REDUCE("",range,
                        LAMBDA(acc,v,
                        VSTACK(acc,TEXTSPLIT(v," "))))),
         ""),
1))
```

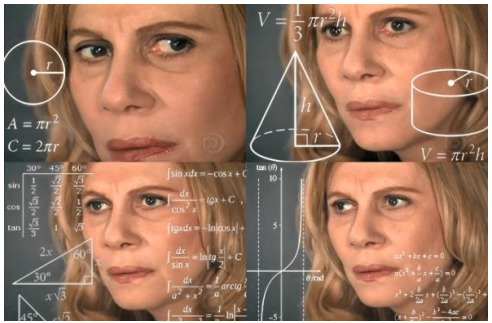
The magic of REDUCE #2

REDUCE("",range,**LAMBDA**(acc,v,
VSTACK(acc,**TEXTSPLIT**(v," "))))

I start from blank - which will be removed by DROP.

Split by space at each occurrence in the original text.

Then - stack them vertically (accumulator + value).



The magic of REDUCE #2

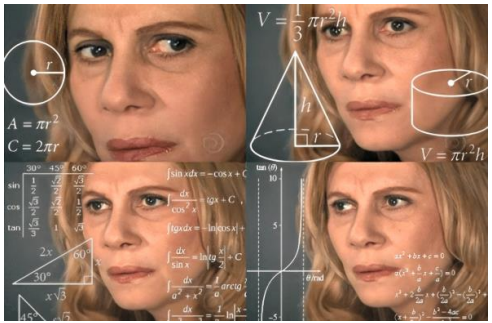
REDUCE("",range,**LAMBDA**(acc,v,
VSTACK(acc,**TEXTSPLIT**(v," "))))

Text: London Excel Meetup rocks

The outcome would be : "" | London | Excel | Meetup | rocks

I need **IFERROR** to avoid errors (max # of words).

I need **DROP** to remove the "".



To LAMBDA - or not to LAMBDA

Let's join what is now in different cells

"Now that all words are **separated**, I can **substitute** each of them. Then, **I need to put everything together at row level**"

My new LAMBDA

```
=LET(
  start,TBL,
  words_to_replace,TBL_REF[OLD],
  new_words,TBL_REF[NEW],
  starting_words,DROP(IFERROR(REDUCE("",
                    start,LAMBDA(acc,v,VSTACK(acc,TEXTSPLIT(v," "))))),""),1),
  review_words,MAP(starting_words,LAMBDA(x,
                  XLOOKUP(x,words_to_replace,new_words,x))),
  final_text,BYROW(review_words,LAMBDA(x,TEXTJOIN(" ",TRUE,x))),
  final_text)
```

My new LAMBDA - simplified

```
=LET(
    start, TBL,
    words_to_replace, TBL_REF[OLD],
    new_words, TBL_REF[NEW],
    starting_words,EXPLODING_CELLS(start),
    review_words, MAP(starting_words,LAMBDA(x,
                        XLOOKUP(x,words_to_replace,new_words,x))),
    final_text,BYROW(review_words,LAMBDA(x,TEXTJOIN(" ",TRUE,x))),
   final_text)
```

My LAMBDA (final)

=**LAMBDA**(start,words_to_replace,new_words,

LET(
starting_words,**EXPLODING_CELLS**(start),
review_words,**MAP**(starting_words,**LAMBDA**(x,
XLOOKUP(x,words_to_replace,new_words,x))),
final_text,**BYROW**(review_words,**LAMBDA**(x,**TEXTJOIN**(" ",TRUE,x))),
final_text))

What the user should insert

The user will have to define 3 parameters:

- Where the **words are**
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=LET(
*start, **TBL,***
*words_to_replace, **TBL_REF[OLD]**,*
*new_words, **TBL_REF[NEW],***

It works!

What about different dividers?

"There is a comma, should I account for it?"

Talking about overcomplicating LAMBDAs...

A never-ending cycle

LAMBDAs do not need to account for every possible scenario.

RECAP

About LAMBDAs

How to overcomplicate LAMBDAs

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- **Do not use LET**. A 3-characters function cannot be taken seriously

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- **Do not explain your thought process to stakeholders**. Ever

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- **Do not use a clear name** for your LAMBDAs. It shows weakness

How to overcomplicate LAMBDAs

- **Do not use LET**. A 3-characters function cannot be taken seriously

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- **Do not use LAMBDAs for simple calculations**, they are not worthy

How to overcomplicate LAMBDAs

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- **Do not use LAMBDAs for simple calculations**, they are not worthy

- **Do not reconsider what you have done** with LAMBDAs in the **past**

How to overcomplicate LAMBDAs

- **Do not use LET**. A 3-characters function cannot be taken seriously

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- **Do not use a clear name** for your LAMBDAs. It shows weakness

- **Do not use LAMBDAs for simple calculations**, they are not worthy

- **Do not reconsider what you have done** with LAMBDAs in the **past**

How to manage LAMBDAs

Use LET. A 3-characters function **must** be taken seriously

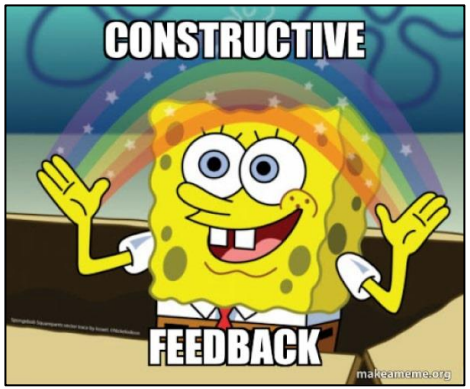
Explain your thought process to stakeholders

Use a clear name for your LAMBDAs

Use LAMBDAs for simple calculations as well

Reconsider what you have done with LAMBDAs in the **past**

The right approach when creating LAMBDAs



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LAMBDAs will skyrocket your overall Excel knowledge, regardless of your level.

They help to think about **problems strategically.**

They help to reduce **repetitions in formulas.**

They help to discover **innovative ways on how to use functions.**

Scaled at company level, **they may become invaluable.**

To sum up: how to give feedback on a LAMBDA

"You said what about my LAMBDAs, mate?"

Thank you for inviting me - and see you all soon!

Excel 365: The Subtle Art of Overcomplicating LAMBDAs Q&A

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