

AN 8-PAGE COMIC

IN WHICH

A FICTIONAL, MORE VISUAL
ALTERNATIVE TO SPREADSHEETS

CALLED

NAPKIN

IS MOTIVATED, PRESENTED & ELABORATED
IN SOME DETAIL.

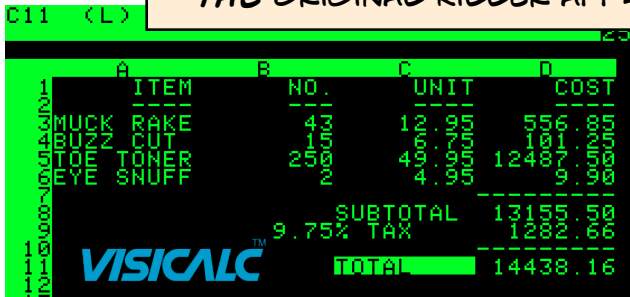
MADE FOR HIS OWN
ILLUSTRATION & EDIFICATION
BY THE FELLA

ELI PARRA

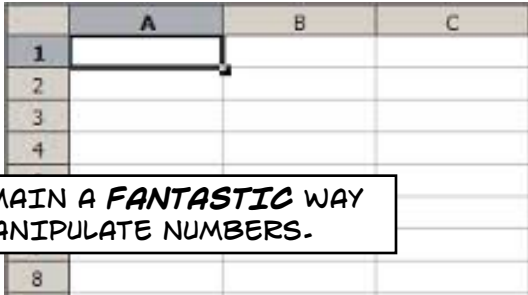
APRIL 25, 2014
GUADALAJARA, MEXICO



SPREADSHEETS WERE THE ORIGINAL KILLER APP.



THEY REMAIN A **FANTASTIC** WAY TO MANIPULATE NUMBERS.



AND THEY'RE AN ACCESSIBLE WAY TO PROGRAM VISUALLY.

	A	B	C
1	input	x	output
2	1	2	2
3	2		4
4	3		6
5	4		8
6	5		10

VS

```
input = [1,2,3,4,5]
output = []
input.each do |n|
  output += [2*n]
end
puts output
#=> [2, 4, 6, 8, 10]
```

THEY'RE MUCH LESS OPAQUE & FORGIVING THAN TEXT-ONLY PROGRAMMING

SPREADSHEETS USE COORDINATES FOR LABELLING

THESE LABELS ARE COMMENTS: FOR YOU, NOT FOR THE PROGRAM

	A	B	C
1	input	x	output
2	1	2	2
3	2		4
4	3		6
5	4		8
6	5		10

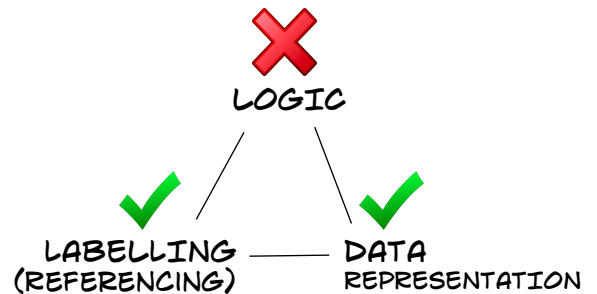
THE LABELLING IS **FIXED** BUT YOU GET IT FOR FREE.

THEY SHINE AT WHAT **TABLES** DO BEST:

Date	Number of bitcoins	Cost per bitcoin	Initial Cost	Current Value	Gain/Loss	Percent Gain/Loss
12/3/2013	0.2	\$1,077.45 X	\$215.49	\$100.40	-\$115.09	-53.41%
12/14/2013	0.2	\$864.30 X	\$172.86	\$100.40	-\$72.46	-41.92%
12/21/2013	0.2	\$605.05 X	\$121.01	\$100.40	-\$20.61	-17.03%
12/29/2013	0.5	\$745.75 X	\$372.88	\$251.00	-\$121.88	-32.69%
1/8/2014	0.2	\$832.70 X	\$166.54	\$100.40	-\$66.14	-39.71%
1/9/2014	1	\$815.02 X	\$815.02	\$502.00	-\$313.02	-38.41%
2/7/2014	0.2	\$738.55 X	\$147.71	\$100.40	-\$47.31	-32.03%
2/9/2014	0.25	\$729.92 X	\$182.48	\$125.50	-\$56.98	-30.94%
2/8/2013	0.05	\$683.72 X	\$34.19	\$25.10	-\$9.09	-26.58%
2/11/2014	0.25	\$683.72 X	\$170.93	\$125.50	-\$45.43	-26.58%
2/14/2014	1.1	\$642.55 X	\$706.81	\$552.20	-\$154.61	-21.87%
2/24/2013	1	\$506.16 X	\$506.16	\$502.00	-\$4.16	-0.82%
2/24/2013	1	\$472.52 X	\$472.52	\$502.00	\$29.48	6.24%
3/3/2014	0.4	\$622.10 X	\$248.84	\$200.80	-\$48.04	-19.31%
3/15/2014	0.3	\$647.53 X	\$194.26	\$150.60	-\$43.66	-22.47%
3/24/2014	0.5	\$571.12 X	\$285.56	\$251.00	-\$34.56	-12.10%
3/26/2014	1	\$571.55 X	\$571.55	\$502.00	-\$69.55	-12.17%
3/27/2014	1	\$524.28 X	\$524.28	\$502.00	-\$22.28	-4.26%
3/27/2014	1	\$520.00 X	\$520.00	\$502.00	-\$18.00	-3.46%
3/30/2014	1	\$464.49 X	\$464.49	\$502.00	\$37.51	8.08%
3/31/2014	1	\$471.17 X	\$471.17	\$502.00	\$30.83	6.54%
3/31/2014	2	\$473.89 X	\$947.78	\$1,004.00	\$56.22	5.93%
3/31/2014	0.18	\$468.11 X	\$84.26	\$90.36	\$6.10	7.24%
4/1/2014	0.35	\$489.51 X	\$171.33	\$175.70	\$4.37	2.55%
4/2/2014	0.5	\$435.26 X	\$217.63	\$251.00	\$33.37	15.33%
4/2/2014	0.5	\$428.82 X	\$214.41	\$251.00	\$36.59	17.07%
4/2/2014	0.5	\$427.12 X	\$213.56	\$251.00	\$37.44	17.53%
4/3/2014	0.5	\$455.24 X	\$227.62	\$251.00	\$23.38	10.27%
4/10/2014	1	\$418.01 X	\$418.01	\$502.00	\$83.99	20.09%
4/10/2014	1	\$383.75 X	\$383.75	\$502.00	\$118.25	30.81%
4/10/2014	1	\$389.11 X	\$389.11	\$502.00	\$112.89	28.99%
Total Since December 3, 2013	19.88		\$10,611.45	\$9,979.76	-\$631.69	-5.95%

HANDLING LISTS OF ITEMS WITH MANY (NUMERICAL) ATTRIBUTES.

PROGRAMMING HAS 3 BASIC PARTS:



SPREADSHEETS HAVE UNIQUE VISUAL SOLUTIONS FOR THESE 2 PARTS.

AND USE **SPATIAL ARRANGEMENT** FOR DATA REPRESENTATION.

	A	B	C
1	input	x	output
2	1	2	2
3	2		4
4	3		6
5	4		8
6	5		10

YOUR DATA IS ALWAYS VISIBLE, ALWAYS SOMEWHERE

THE **GENIUS** WAS IN LEVERAGING THE VISUAL LAYOUT HUMANS NEED AS THE DATA STRUCTURE.

THE LOGIC, THOUGH, IS STILL HIDDEN & SEPARATE IN A **FORMULA BAR**

	A	B	C	D	E
1	input	x	output		
2	1	2	2		
3	2		4		
4	3		6		
5	4		8		
6	5		10		

MOST OF THE SYMBOLIC & SYNTACTIC COMPLEXITY WAS CRAMMED HERE, OUT OF SIGHT.

FOR MANY **CASUAL** TASKS, TABLES & FORMULAS CAN BE A **CLUNKY** OVERFORMALIZATION

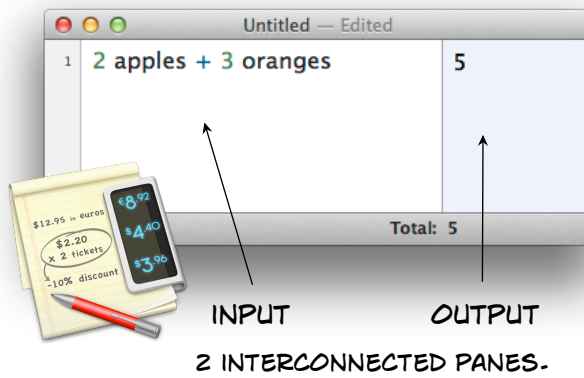
$$2+3=5$$

	A	B	C	D
1		2	3	5
2				

WHAT YOU WANT

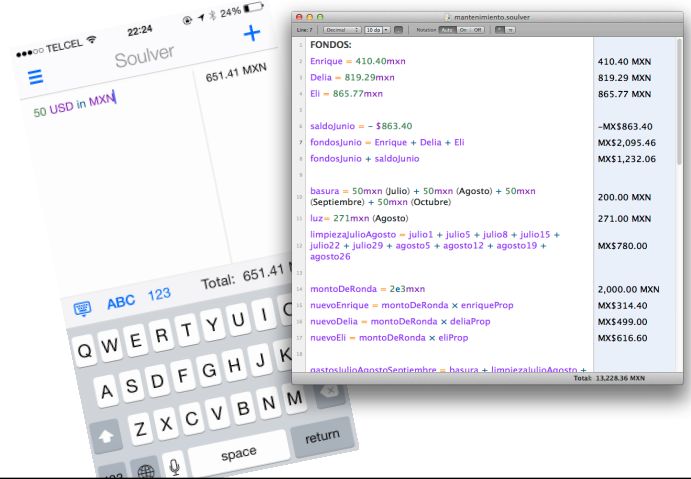
THE IMMEDIACY OF A CALCULATOR WITH THE FLEXIBILITY OF A PIECE OF PAPER.

SOLVER IS A BRILLIANT MAC & IOS PROGRAM TO DO JUST THAT.



IT IS LINE-BASED & CAN HANDLE WORDS MIXED CASUALLY WITH NUMBERS.

I USE IT ALL THE TIME: IT IS FLEXIBLE & IMMEDIATE.



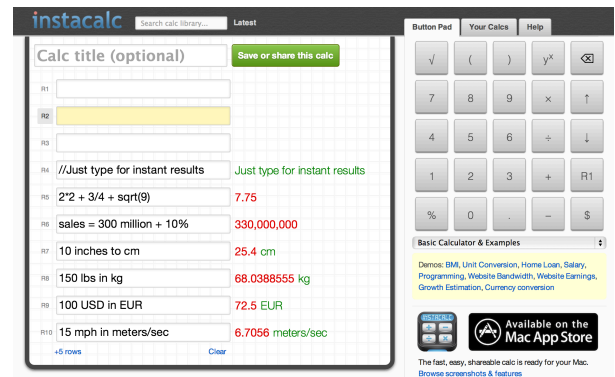
LIVE CURRENCY CONVERSION IS MY KILLER FEATURE.

BUT IT DOESN'T HAVE A WEB VERSION!

THERE'S A WEB APP CALLED **INSTACALC** AROUND A SIMILAR IDEA...

THE **BROWSER** IS A NATURAL HOME FOR A SOLVER-LIKE PROGRAM:

- ✓ IT'S INTERFACE ISN'T FANCY OR INTENSIVE SO IT COULD BE EASILY PORTED.
- ✓ THE CLOUD IS A NATURAL PLACE FOR **DOCUMENTS**: FOR PORTABILITY, BACKUP & SHARING.
- ✓ IT COULD BE EASILY PRICED: FREE TO USE, CHARGE TO STORE.



BUT WHILE IT HAS PLENTY OF GEEKY FEATURES, IT IS **CLUNKY**, **COMPLEX** & **UGLY**.

THE CLICHE WORK OF A LONE PROGRAMMER.

ANYWAY, I SEE THE WEB GAP AS
A **BIG UNTAPPED OPPORTUNITY**

EXCEL & SOULVER FIRST GOT
ME THINKING SERIOUSLY ABOUT
SPREADSHEETS & NUMBER
MANIPULATION.

BUT I'VE ENDED UP
SOMEWHERE QUITE **WEIRD!**

I'M CALLING MY CURRENT EXPLORATIONS

NAPKIN

Volume of all beaches on Earth Volume of a grain of sand

length $\sim 10^5$ km $l \sim 0.5$ mm
avg. width $\sim 10^2$ m $w \sim 0.5$ mm
avg. depth ~ 10 m $h \sim 0.5$ mm

"beaches" $\sim 10^{11} \text{ m}^3$ "sand" $\sim 10^{-10} \text{ m}^3$

\Rightarrow to fill all beaches
requires about 10^{21} grains of sand

I WANT TO SUGGEST RUNNING SOME NUMBERS ON A
NAPKIN OR THE BACK OF AN ENVELOPE.

THERE ARE 3 BASIC CELLS IN NAPKIN:

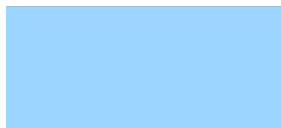
DATA



LABEL

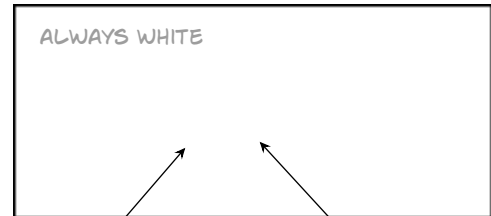


RESULT



A DATA CELL HOLDS YOUR DATA INPUT.

ALWAYS WHITE



NUMBERS CAN BE
MIXED WITH WORDS

USER INPUT,
ALWAYS EDITABLE

LIKE **AUTOMATIC PARENTHESES**.

IT APPEARS ON ITS OWN,
ENCLOSING WHAT YOU TYPE AS YOU TYPE IT.

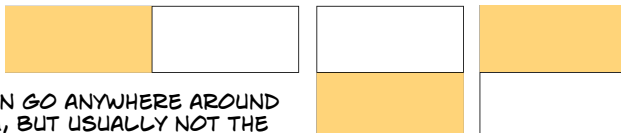
DESPITE CELLS, NAPKIN'S **GROUND METAPHOR** IS
A **TEXT EDITOR**, NOT A SPREADSHEET. YOU'LL SEE...

A LABEL CELL HOLDS NAMES FOR DATA.

ALWAYS ORANGE



USER HAS TO INSERT & PLACE IT



IT CAN GO ANYWHERE AROUND
DATA, BUT USUALLY NOT THE
RIGHT SIDE.

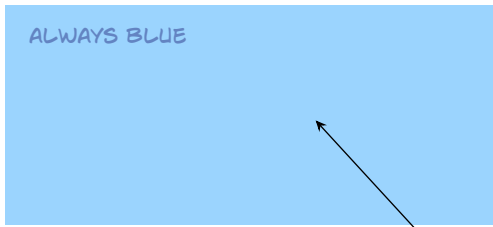
IT'S A **VARIABLE** DECLARATION
(OR, LATER, VARIABLE REFERENCE).



THINK OF IT AS JUST A **NAME TAG** YOU ATTACH
TO KEEP A HANDLE ON DATA.

A **RESULT CELL** GIVES THE RESULT OF THE OPERATIONS DESCRIBED IN THE DATA

ALWAYS BLUE



IT **USUALLY** GOES RIGHT OF DATA: **AUTOMATIC, NEVER EDITABLE**

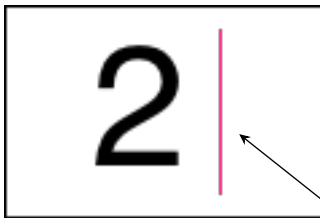


IT APPEARS AUTOMATICALLY AS SOON AS THERE'S SOMETHING TO **CALCULATE**.



THINK OF IT AS THE **OUTPUT** WHAT THINGS TURN INTO ->.

LET'S BEGIN BY TYPING **2** IN A BLANK CANVAS...



CURSOR IS PINK FOR EMPHASIS

AUTOMATICALLY IT IS ENCLOSED BY A WHITE **DATA CELL**

AS SOON AS WE ENTER AN OPERATION...



THE DATA CELL EXPANDS AUTOMATICALLY

TO **EXIT** THE DATA CELL JUST USE THE RIGHT ARROW ->

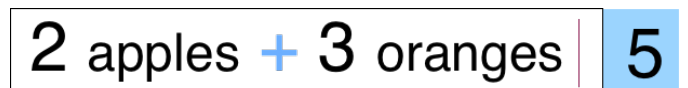
WE GET THE RESULT IN A BLUE **RESULT CELL**.

WE CAN TREAT AN EXISTING DATA CELL SIMPLY AS AN **AUTOMATIC PARENTHESIS**.

DATA CELLS WON'T BE CONFUSED IF YOU THROW THEM SOME WORDS TOO...

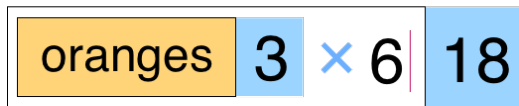
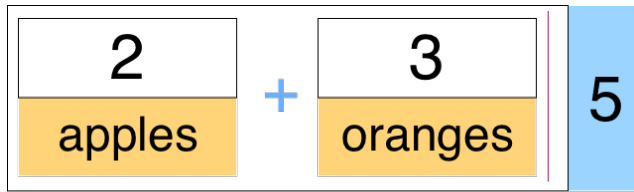


A PARENTHESIS THAT DISPLAYS INTERMEDIATE RESULTS!



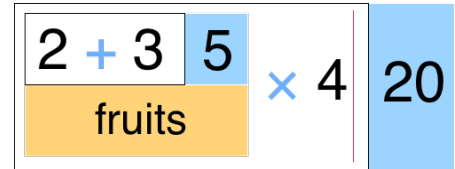
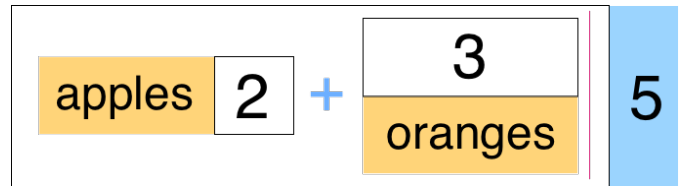
THOUGH IT WON'T DO YOU MUCH GOOD...

WHEN IT GETS INTERESTING IS WHEN YOU TAG DATA CELLS WITH LABELS...



NOW THINGS ARE NEATER & YOU CAN REFER BACK TO THE ORIGINAL VALUES.

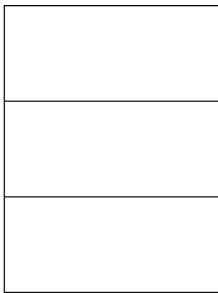
SOME MORE VARIATIONS:



AS WITH SPREADSHEETS, THE POINT IS FOR THE LAYOUT TO HELP BOTH YOU & THE COMPUTER UNDERSTAND.

YOU CAN STACK DATA CELLS INTO A LIST

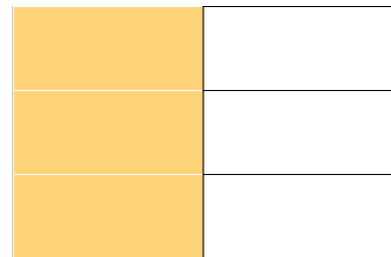
VERTICALLY



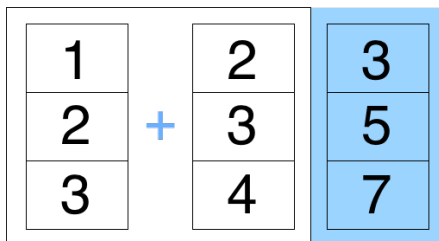
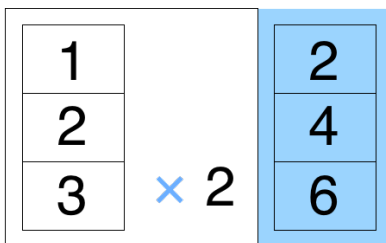
...OR HORIZONTALLY



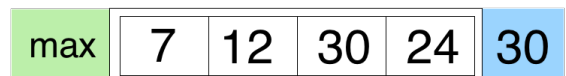
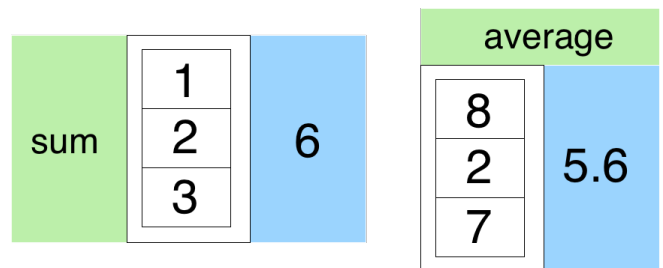
EACH DATA CELL IN A LIST CAN HAVE ITS OWN LABEL



LISTS CAN BE OPERATED ON:



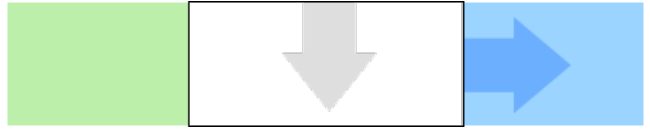
THEY GET INTERESTING WHEN FED TO FUNCTIONS



FUNCTIONS ARE THE LAST KIND OF CELL

ALWAYS GREEN

LIKE A LABEL IT GOES ANYWHERE,
BUT USUALLY NOT RIGHT OF DATA

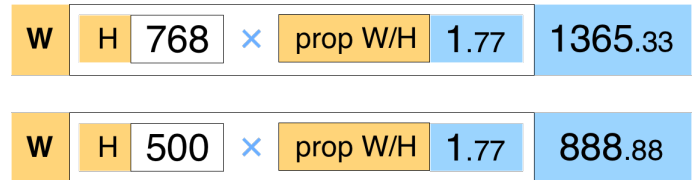
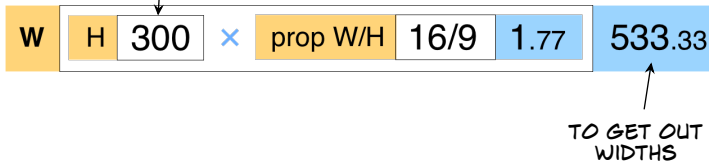


THINK OF A FUNCTION AS **EATING IN DATA**
AND **SPITTING OUT RESULTS**.

THERE ARE MANY **PREDEFINED** FUNCTIONS,
BUT CONSIDER THIS SIMPLE NAPKIN:

IT'S EASY ENOUGH TO REPEAT THE CELLS
WHEN YOU WANT A NEW ANSWER...

YOU WANT TO INPUT
MANY DIFFERENT HEIGHTS



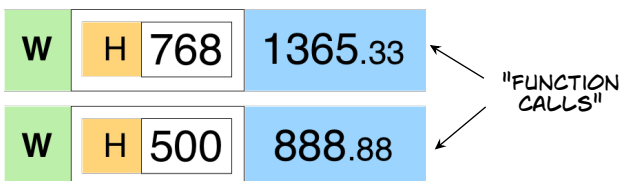
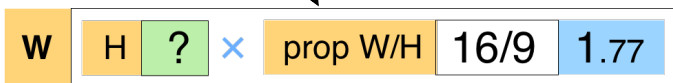
(YOU COULD JUST PLAY WITH VALUES BUT
SUPPOSE YOU WANT TO COMPARE
MANY ANSWERS.)

YOU WANT THE **WIDTH** FOR A GIVEN **HEIGHT**,
ACCORDING TO THE COMMON 16/9 PROPORTION.

IN GENERAL WITH NAPKIN YOU END UP
MAKING **TINY CALCULATING MACHINES**

BUT CONSIDER THE MAGIC ? FUNCTION:

A STATEMENT BECOMES
A "FUNCTION DEFINITION"



IT LETS YOU CREATE NEW FUNCTIONS!



IT'S A LITTLE LIKE **SCRATCH**
A FAMOUS PROGRAMMING LANGUAGE FOR KIDS
MADE OUT OF VISUAL BLOCKS.

NOW A REAL-LIFE DEMO!

FIRST, PEN & PAPER

GASTOS COMUNES

$$\text{FONDOS} = (\$819_{\text{Delia}} + \$865_{\text{Eli}} + \$410_{\text{Enrique}}) - \$863_{\text{saldo anterior}} = \$1,232$$

$$\text{BASURA} = \$50_{\text{Julio}} + \$50_{\text{Agosto}} + \$50_{\text{Sept.}} + \$50_{\text{Octubre}} = \$200$$

$$\text{LUZ} = \$271_{\text{Agosto}}$$

$$\begin{aligned} \text{LIMPIEZA JULIO AGOSTO} &= \$80_{\text{Julio 1}} + \$20_{\text{Julio 5 aseo banqueta}} + \$80_{\text{Julio 8}} + \$120_{\text{Julio 15 entro agua}} + \$80_{\text{Julio 22}} + \$80_{\text{Julio 29}} + \$80_{\text{Agosto 5}} + \\ &+ \$80_{\text{Agosto 12}} + \$80_{\text{Agosto 19}} + \$80_{\text{Agosto 26}} \\ &= \$780 \end{aligned}$$

$$\text{SALDO} = \$1,232_{\text{FONDOS}} - \$200_{\text{BASURA}} - \$271_{\text{LUZ}} - \$780_{\text{LIMPIEZA JULIO-AGOSTO}} = -\$19$$

IN EXCEL

	A	B	C	D	E	F	G	
1			Gastos Comunes					
2								
3		Fondos			Luz			
4		\$ 819.00	Delia		\$ 271.00	Agosto		
5		\$ 865.00	Eli					
6		\$ 410.00	Enrique		Limpieza Julio y Agosto			
7		\$ (863.00)	saldo anterior		\$ 80.00	Julio 1		
8		\$ 1,231.00			\$ 20.00	Julio 5 aseo banqueta		
9					\$ 80.00	Julio 8		
10		Basura			\$ 120.00	Julio 15 entro agua		
11		\$ 50.00	Julio		\$ 80.00	Julio 22		
12		\$ 50.00	Agosto		\$ 80.00	Julio 29		
13		\$ 50.00	Septiembre		\$ 80.00	Agosto 5		
14		\$ 50.00	Octubre		\$ 80.00	Agosto 12		
15		\$ 200.00			\$ 80.00	Agosto 19		
16					\$ 80.00	Agosto 26		
17					\$ 780.00			
18		Saldo						
19		\$ 2,482.00	Fondos + Basura + Luz + Limpieza Julio y Agosto					
20								

IN SOULVER

1	Gastos comunes:	
2	Fondos = \$819 de Delia + \$865 de Eli + \$410 de Enrique - \$863 del fondo anterior	MX\$1,231.00
3	Basura = \$50 Julio + \$50 Agosto + \$50 Septiembre + \$50 Octubre	MX\$200.00
4	Luz = \$271 de Agosto	MX\$271.00
5	LimpiezaJulioAgosto = \$80 (julio1) + \$20(julio5 aseo banqueta) + \$80(julio8) + \$120(julio15 entro agua) + \$80(julio22) + \$80(julio29) + \$80(agosto5) + \$80(agosto12) + \$80(agosto19) + \$80(agosto26)	MX\$780.00
6		
7	Saldo = Fondos - Basura - Luz - LimpiezaJulioAgosto	-MX\$20.00
		Total: MX\$2,462.00

PARENTHESES ARE NECESSARY SO THAT DATES AREN'T CONFUSED WITH CURRENCY

AND IN NAPKIN!

Gastos Comunes:

Fondos	\$819 Delia	+	\$865 Eli	+	\$410 Enrique	-	\$863 saldo anterior	\$1,231
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Basura	\$50 Julio	+	\$50 Agosto	+	\$50 Septiembre	+	\$50 Octubre	\$200
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Luz	\$271
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Limpieza Julio y Agosto		
Julio 1	\$80	+ \$780
Julio 5 aseo banqueta	\$20	
Julio 8	\$80	
Julio 15 entro agua	\$120	
Julio 22	\$80	
Julio 29	\$80	
Agosto 5	\$80	
Agosto 12	\$80	
Agosto 19	\$80	
Agosto 26	\$80	
Saldo	Fondos + Basura + Luz + Limpieza Julio y Agosto	\$2,482
	\$1,231 + \$200 + \$271 + \$780	

TO REVIEW, NAPKIN IS MEANT FOR CASUAL NUMBER MANIPULATION

WHAT NAPKIN EXCELS AT IS AT THINKING WITH NUMBERS, VISUALLY

CALCULATOR



SPREADSHEET

	A	B
1		
2		
3		
4		
5		
6		
7		
8		

DATABASE

users	tweets
full_name	id
username	text
text	created_at
created_at	username
	following
	from_user
	to_user

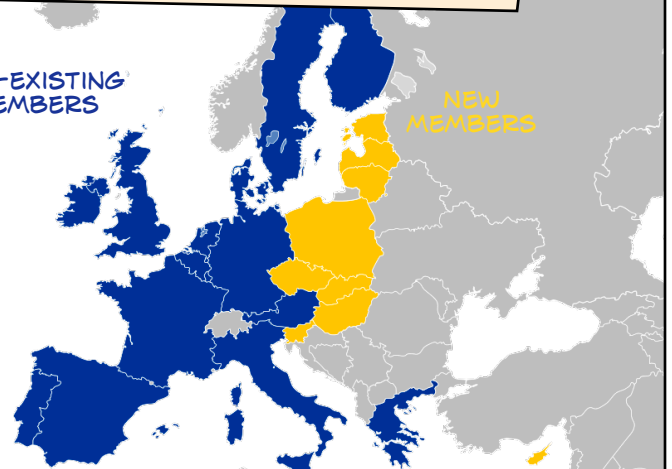
NAPKIN!

PEN & PAPER

IT IS FAR FROM DATABASES.

PRE-EXISTING MEMBERS

NEW MEMBERS

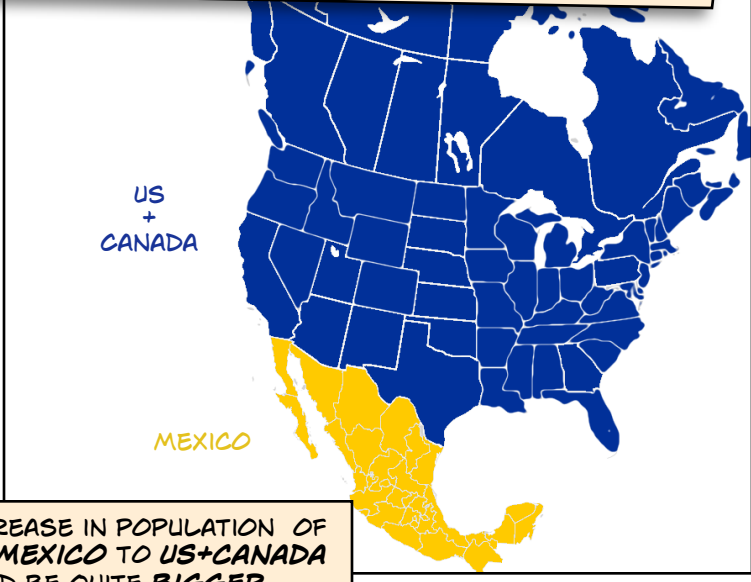


FOR EXAMPLE, THE 2004 ENLARGEMENT OF THE EU WAS ITS LARGEST IN TERMS OF TERRITORY, STATES & POPULATION

LET'S FIND HOW BIG AN INCREASE IN POPULATION IT WAS:

19.35%	
Old EU population	
384.5e6	
New EU population	
74.4e6	
Cyprus	1.02e6
Czech Rep.	10.2e6
Estonia	1.35e6
Hungary	10.1e6
Lithuania	3.43e6
Latvia	2.32e6
Malta	0.40e6
Poland	38.2e6
Slovenia	2e6
Slovakia	5.41e6
+	
as % of	
Belgium	10.4e6
Germany	82.5e6
France	60.6e6
Italy	58.3e6
Luxembourg	0.45e6
Netherlands	16.2e6
Denmark	5.4e6
Ireland	4.09e6
UK	59.9e6
Greece	11.1e6
Spain	42.7e6
Portugal	10.5e6
Austria	8.19e6
Finland	5.23e6
Sweden	8.98e6
+	

LET'S COMPARE THE EU WITH NAFTA AND WHAT A SIMILAR EXPANSION WOULD BE LIKE...



(ALL STATS FROM NOW ON ARE FROM 2004)

BACKBARS WORK MAGICALLY ON LISTS

THE INCREASE IN POPULATION OF ADDING MEXICO TO US+CANADA WOULD BE QUITE BIGGER...

Mexico population	105e6	as % of	+	US 294e6	Canada 31.9e6	326e6	32.21%
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NOW THE EU INCREASE WOULD BE SLIGHTLY BIGGER

HOW ABOUT THE INCREASE IN THE SIZE OF THE ECONOMY?

Mexico GDP (PPP)	1.212e12	as % of	+	US 12.28e12	Canada 1.049e12	13.33e12	9.09%
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9.82%	
Old EU GDP (PPP)	
11.25e12	
Belgium	324.9e9
Germany	2.449e12
France	1.761e12
Italy	1.601e12
Luxembourg	29.74e9
Netherlands	540.3e9
Denmark	174.5e9
Ireland	149.1e9
UK	1.918e12
Greece	263.9e9
Spain	1.108e9
Portugal	208.5e9
Austria	268.4e9
Finland	156.1e9
Sweden	292.2e9
+	
as % of	
New EU GDP (PPP)	
1.105e12	
Cyprus	17.16e9
Czech Rep.	205e9
Estonia	19.93e9
Hungary	163.6e9
Lithuania	44.53e9
Latvia	27.12e9
Malta	7.99e9
Poland	496.7e9
Slovenia	44.47e9
Slovakia	78.87e9
+	

BUT PERHAPS THIS IS THE CLEAREST WAY TO COMPARE THE MAGNITUDE OF THE DIFFERENCE:

In %, how wealthy were Mexicans compared to US+Canada citizens in 2004?					
Mexico GDP per person		as % of	US + Canada GDP per person		28.23%
Mexico GDP (PPP)	\$1,212e12		US+Canada GDP (PPP)	\$13.33e12	
Mexico population	105e6		US+Canada population	326e6	

In %, how wealthy were the new Europeans compared to the old Europeans in 2004?					
New EU GDP per person		as % of	Old EU GDP per person		50.63%
New EU GDP (PPP)	\$1.105e12		Old EU GDP (PPP)	\$11.25e12	
New EU population	74.6e6		Old EU population	384.5e6	

1.79 TIMES!

THAT'S IT!

IT'S ALL STILL JUST A DREAM,
ONLY RUNNING ON MY HEAD...
AND YOURS NOW!

THANKS FOR
READING :)

TELL ME WHAT YOU THINK!

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MADE WITH  AND

