



Elliott Malkin

Recent work

About Elliott

Elliott is a **UX Designer** currently focused on big data and ML-based assistance at **Google**. Prior to Google, Elliott spent 4 years as Product Design Director for Mobile at **The New York Times**, building the company's first generation of mobile apps. He also hosted a podcast that broke into the iTunes Top 100, and was an artist-in-residence at Eyebeam, where he mined stories at the intersection of science and culture. Elliott taught design at the **Columbia Graduate School of Journalism** and writing at **NYU**.

Assistive UX Principles

My summary from two years of ML-based design
& research, across multiple launched initiatives

Focused & contextual

Proactive suggestions should be triggered by relevant user behaviors and, where possible, displayed **adjacent** to where the user is working on the canvas.

Action-oriented

Suggestions should **perform valuable actions**. And while doing so, educate the user about those actions.

Proactive but suppressible

Users value high quality, action-based suggestions. However, some users prefer not to see them so should be **easy to disable**.

Previewable

Users must be able **preview the results** of a suggestion, particularly if it involves any changes to their data.

Accessible later

Users may not be ready to accept a suggestion precisely when it is provided so must know how to **find or trigger it later**, when possible. Also known as “recall.”

	B	C	D	E	
	Owner	Platform	Tactic	Tasks	Status
	Janet Gilboa			Upload assets	Not Started
	Sikhu Baptista			Asset Creation	Not Started
	Janet Gilboa			Asset Creation	Not Started
	Augustin Silvers			Send to prod	Not Started
	Sikhu Baptista			Send to prod	Not Started
	Aron Singh			Asset Creation	Not Started
	Aron Singh	Instagram story	Giftcard	Asset creation	Not Started
	Augustin Silvers	Website	Coupon code	Upload assets	Not Started
	Janet Gilboa	Website	Giveaway	Upload assets	Not Started
	Janet Gilboa	Instagram post	Giftcard	Asset Creation	Not Started
	Sikhu Baptista	Instagram story	Contest	Asset Creation	Not Started
	Janet Gilboa	Facebook	Contest	Asset Creation	Not Started
	Augustin Silvers	Radio	Contest	Upload Assets	Not Started

Filter to you

Create a filter view displaying only the rows matching your name in column B. Nothing will be deleted.



Recipients of shared sheets might see a suggestion to filter down to rows with their assigned tasks.

Smart Cleanup

You can't draw insights from dirty data

Background

Analysts spend significantly more time **cleaning and preparing data** than analyzing and drawing insights from that data.*

If I summarize this data, I'll have three different results for this country!

There's a hidden space after the country name here!

Exact duplicate of above row!

The percentages in this column are hard to read. Can I reformat?

This is not a clothing type!

	A	B	C	D	E	
1	Country	Revenue	Net Income	Category	Change	
2	U.S.A	\$67,988	\$10,500	Jeans	0.01725981187	
3	US	\$78,333	\$13,500	Shirts	0.02114913669	
4	United States	\$130,511	\$23,990	Shoes	0.01980184097	
5	India	\$43,000	\$5,900	Apple	0.01551305863	
6	India	\$56,400	\$8,800	Accessories	0.02078200814	
7	Germany	\$94,500	\$16,500	Jeans	0.01927982341	
8	US	\$105,524	\$18,810	Shirts	0.01816892191	
9	India	\$118,017	\$21,400	Shoes	0.02028987748	
10	US	\$143,004	\$26,580	Coats	0.01411418701	
11	Germany	\$155,497	\$29,170	Jeans	0.01627044089	
12	India	\$167,991	\$31,760	Shirts	0.01732563264	
13	India	\$180,484	\$34,350	Shoes	0.01830440804	
14	Germany	\$94,500	\$16,500	Jeans	0.01623365667	
15	United States	\$192,977	\$36,940	Accessories	0.02204550195	
16	US	\$205,471	\$39,530	Jeans	0.01726785835	

Data prep is the most **time-consuming, repetitive, and least enjoyable** part of analysts' work.*

Now imagine correcting these by hand over **thousands of rows!**

Smart Cleanup is a tool that detects inconsistencies in your data and provides **one-click normalization**.

INCONSISTENT DATA

United States

Apply to all cells below

✓

✕

C12	United States
C24	USA
C29	U.S.A.
▼	

It also provides categorical analysis. For example, if we detect a column comprised of **stock symbols**, we flag items that are not stock symbols.

INVALID DATA

GOOGL

Apply to all cells below

These cells are not **stock symbols**

A5	Google
A13	Google
A17	Google
▼	

We also developed **cleanup** actions for three other common issues.

WHITESPACE

Trim whitespace

☒ ☐

B12	yuyu@lemonade.com
B23	davis@lemonade.com
B25	elliot@lemonade.com

▼

DUPLICATE ROWS

Remove duplicates

☒ ☐

8	Phila...	yuyu@lemonade.com
12	Phila...	yuyu@lemonade.com
15	Phila...	yuyu@lemonade.com
22	Phila...	yuyu@lemonade.com

▼

COLUMN FORMAT

Apply formats

☒ ☐

E	1000.12	\$1000.12	▼	✓
F	1000.12	\$1000.12	▼	✓
G	1000.12	\$1000.12	▼	✓

▼

They all come together in the cleanup sidebar,
triggered on import.

Lemonade inc. ☆ 📁

File Edit View Insert Format Data Tools Add-ons Help All changes saved...

100% \$ % .0 .00 123 Arial 10 B

	A	B	C	D	E	F
1	Branch	Manager	Date	Sales	Temperature	Transactions
2	NYC	elliott@lemonade	8/24/19	1026.03	98	
3	NYC	elliott@lemonade	8/25/19	977.28	87	
4	Keep	elliott@lemonade	8/26/19	876.25	80	
5	Philadelphia	yuyu@lemonade.	8/24/19	880.23	88	
6	Boston	danny@lemonade	8/25/19	975.38	82	
7	Remove	danny.smith	8/26/19	1001.23	90	
8	Philadelphia	yuyu@lemonade.	8/24/19	880.23	88	
9	Philadelphia	yuyu@lemonade.	8/24/19	880.23	88	
10	Philadelphia	yuyu@lemonade.	8/24/19	880.23	88	
11	Philadelphia	yuyu@lemonade	8/24/19	880.23	88	
12	Philadelphia	yuyu@lemonade.	8/24/19	880.23	88	
13	Washington DC	anna@lemonade	8/26/19	892.32	96	
14	Chicago	andy@lemonade.	8/24/19	1000.23	89	
15	Atlanta	zifan@lemonade	8/24/19	789.78	76	
38	Atlanta	zifan@lemonade	8/24/19	789.78	76	
47	Atlanta	zifan@lemonade	8/24/19	789.78	76	

Cleanup suggestions ✕

All columns ▾

DUPLICATE ROWS

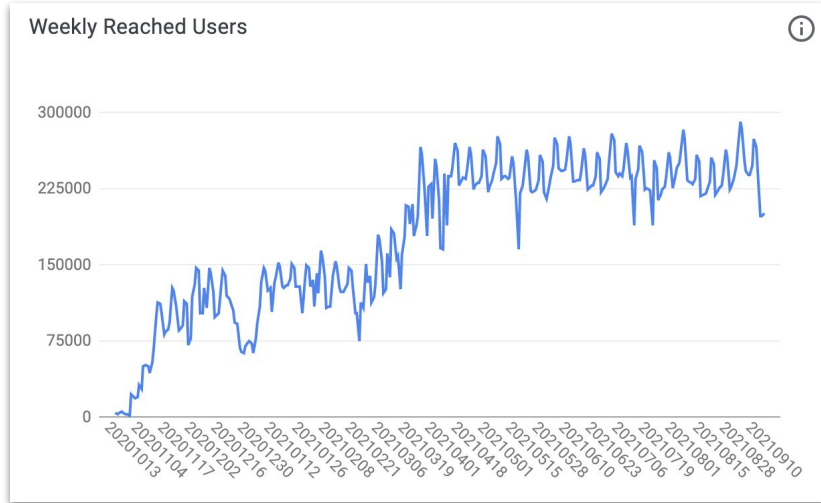
Remove duplicates

✓ ✕

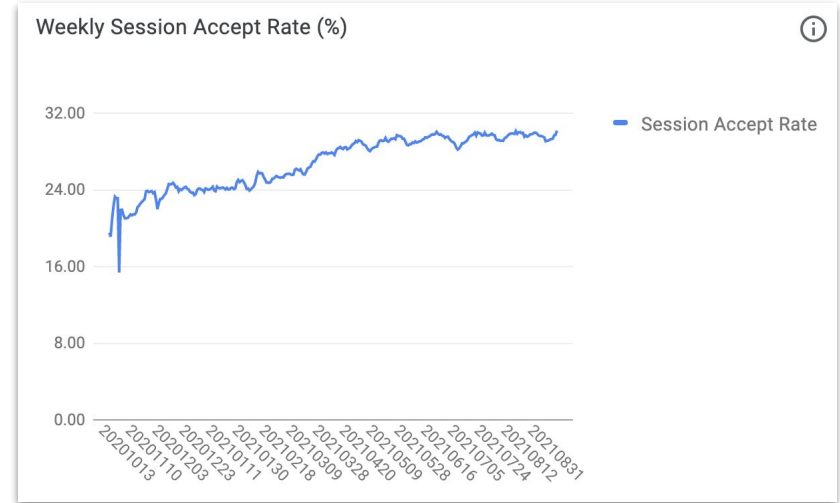
5	Phila...	yuyu@lemonade.com
8	Phila...	yuyu@lemonade.com
9	Phila...	yuyu@lemonade.com
10	Phila...	yuyu@lemonade.com

▼

Smart Cleanup usage



~275k weekly actives, which is close to pivot table usage



~30% acceptance rate, very high for an assistive feature (10% goal). 4.2 CSAT (4.0 goal)

What users are saying

“Bless you. This is a **beautiful feature**. Not everyone will appreciate it, but by god I do.”

“That was **unexpected** and **amazing**. I honestly cannot wait to see what else this feature finds. Slick.”

“THANK YOU!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! This **will save me hours** and hours!”

“Thank you google overlords for this **wonderful gift**”

“THIS cleanup suggestion was **ON POINT!** Thank you so very much BEST FEATURE EVER!”

“It's **intuitive** and **perfect**, thank you to the whole google team for the efforts and investment in science and IT”

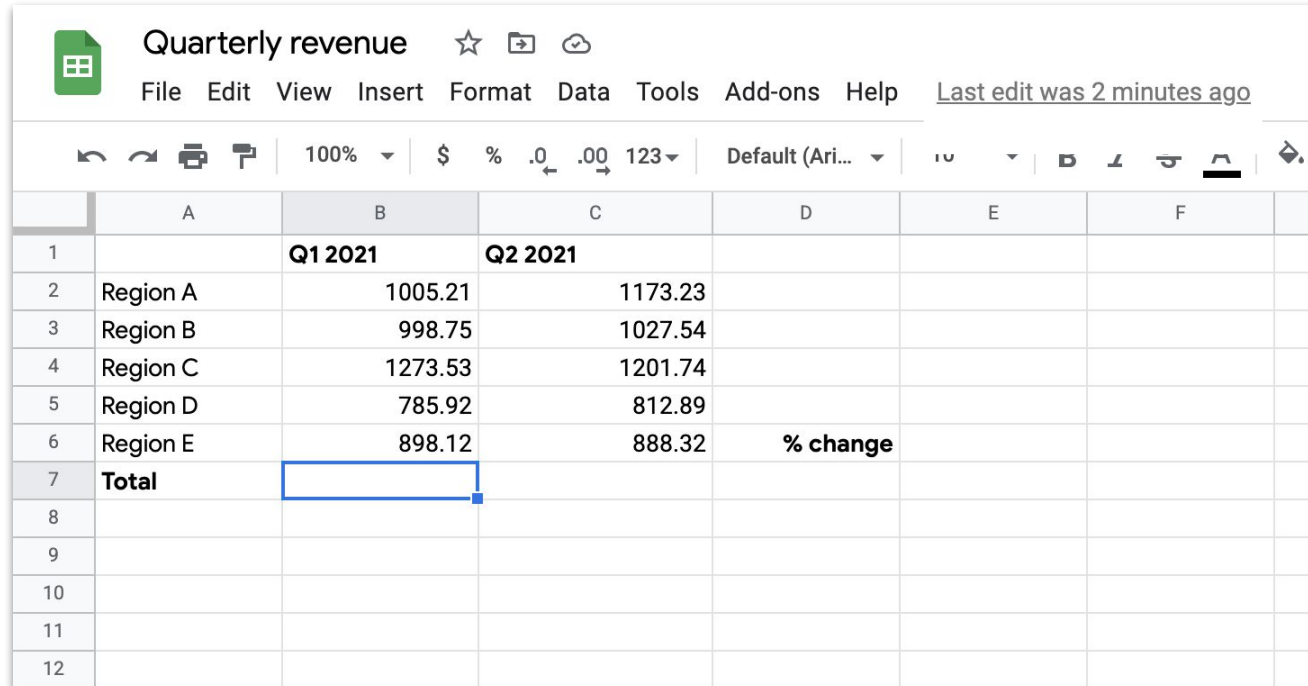
“OMG this is **mind blowing** - thank you!!!”

“This is so freaking **incredible**”

Assisted Formulas

Context-aware suggestions for speed and accuracy

Formulas are difficult. Even the simplest operations are akin to writing code.

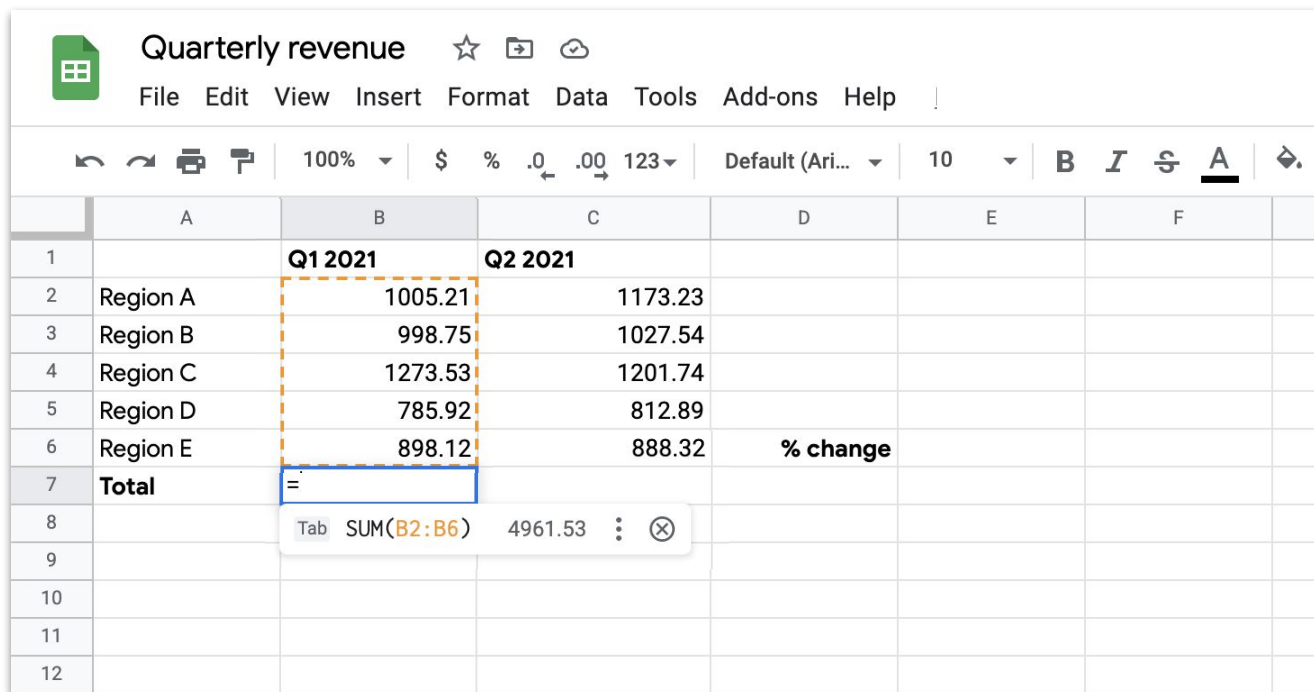


The screenshot shows a Google Sheets interface with a spreadsheet titled "Quarterly revenue". The spreadsheet has columns A through F and rows 1 through 12. The data is as follows:

	A	B	C	D	E	F
1		Q1 2021	Q2 2021			
2	Region A	1005.21	1173.23			
3	Region B	998.75	1027.54			
4	Region C	1273.53	1201.74			
5	Region D	785.92	812.89			
6	Region E	898.12	888.32	% change		
7	Total					
8						
9						
10						
11						
12						

With ML, we can **predict** the desired formula for a cell with a high degree of confidence.

The user can simply **tab** to accept the suggested formula.



The screenshot shows a Google Sheets interface with a spreadsheet titled "Quarterly revenue". The spreadsheet has columns A through F and rows 1 through 12. The data is organized as follows:

	A	B	C	D	E	F
1		Q1 2021	Q2 2021			
2	Region A	1005.21	1173.23			
3	Region B	998.75	1027.54			
4	Region C	1273.53	1201.74			
5	Region D	785.92	812.89			
6	Region E	898.12	888.32	% change		
7	Total	=				
8						
9						
10						
11						
12						

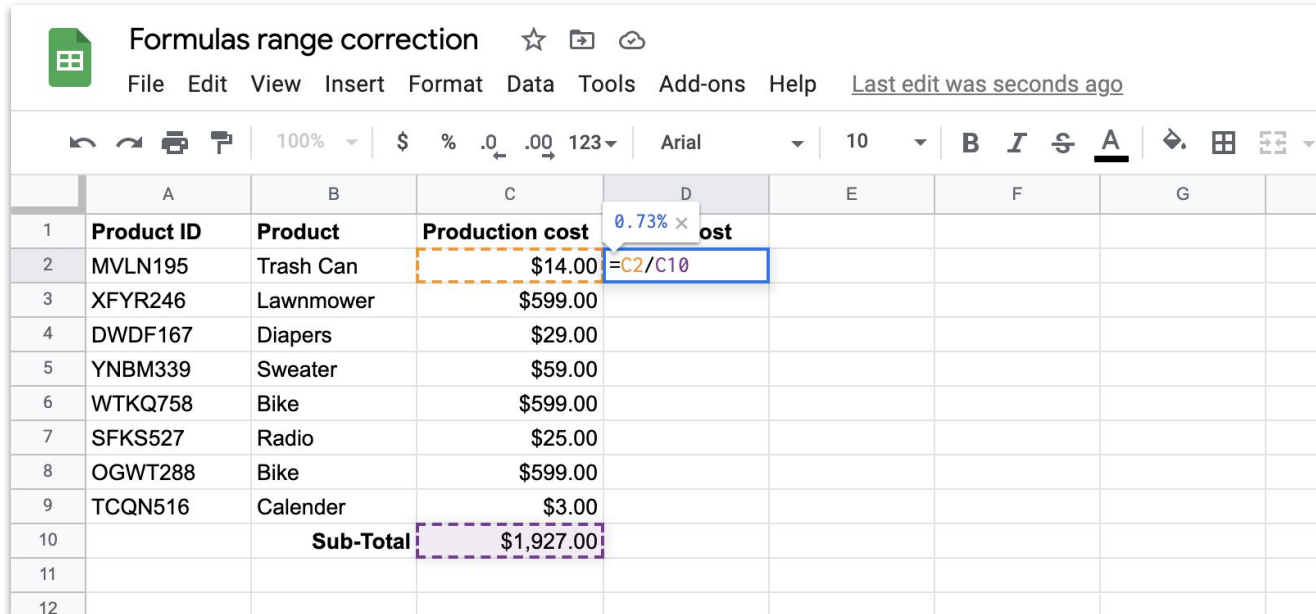
A dashed orange box highlights the range B2:B6. A blue box highlights the formula bar in row 7, which contains an equals sign (=). A tooltip is visible below the formula bar, showing the suggested formula: `Tab SUM(B2:B6)` with the result `4961.53` and a close button (X).

Or ignore the suggestion and type past it.

Here it is in action across a series of cells.

Quarterly revenue ☆ 📁							
File Edit View Insert Format Data Tools Add-ons Help Last edit was 18 minutes ago							
↶ ↷ 🖨️ 📌 100% ▾ \$ % .0 ↵ .00 ↶ 123 ▾ Arial ▾ 10 ▾ B <i>I</i> <u>S</u> <u>A</u> 🔍							
	A	B	C	D	E	F	G
1		Q1 2021	Q2 2021				
2	Region A	1005.21	1173.23				
3	Region B	998.75	1027.54				
4	Region C	1273.53	1201.74				
5	Region D	785.92	812.89				
6	Region E	898.12	888.32	% change			
7	Total						
8							
9							
10							
11							
12							

We also suggest corrections for formulas that are written by hand or pasted across cells.



The screenshot shows a Google Sheets interface with a spreadsheet titled "Formulas range correction". The spreadsheet has columns A through G and rows 1 through 12. The data is as follows:

	A	B	C	D	E	F	G
1	Product ID	Product	Production cost	0.73% × ost			
2	MVLN195	Trash Can	\$14.00	=C2/C10			
3	XFYR246	Lawnmower	\$599.00				
4	DWDF167	Diapers	\$29.00				
5	YNBM339	Sweater	\$59.00				
6	WTKQ758	Bike	\$599.00				
7	SFKS527	Radio	\$25.00				
8	OGWT288	Bike	\$599.00				
9	TCQN516	Calender	\$3.00				
10		Sub-Total	\$1,927.00				
11							
12							

A blue dashed box highlights the formula "=C2/C10" in cell D2, which is being corrected from the handwritten "0.73% × ost". A tooltip shows the correction. The cell C10, containing the value "\$1,927.00", is highlighted with a purple dashed box.

For example, the formula in D2 will break
when pasted across D3:D10.

<div>Formulas range correction</div> <div>File Edit View Insert Format Data Tools Add-ons Help</div> <div>Last edit was seconds ago</div>							
<div>100% \$ % .0 .00 123 Default (Ari... 10 B I S A</div>							
	A	B	C	D	E	F	G
1	Product ID	Product	Production cost	% total cost			
2	MVLN195	Trash Can	\$14.00	0.73%			
3	XFYR246	Lawnmower	\$599.00	#DIV/0!			
4	DWDF167	Diapers	\$29.00	#DIV/0!			
5	YNBM339	Sweater	\$59.00	#DIV/0!			
6	WTKQ758	Bike	\$599.00	#DIV/0!			
7	SFKS527	Radio	\$25.00	#DIV/0!			
8	OGWT288	Bike	\$599.00	#DIV/0!			
9	TCQN516	Calender	\$3.00	#DIV/0!			
10		Sub-Total	\$1,927.00				
11							
12							

When this happens, we suggest the fix, an **absolute cell reference**.

Formulas range correction

File Edit View Insert Format Data Tools Add-ons Help Last edit was seconds ago

100% \$ % .0 .00 123 Arial 10 B I S A

	A	B	C	D	E	F	G
1	Product ID	Product	Production cost	% total cost			
2	MVLN195	Trash Can	\$14.00	D3:D9 0.73%			
3	XFYR246	Lawnmower	\$599.00	#DIV/0!			
4	DWDF167	Diapers	\$29.00	#DIV/0!			
5	YNBM339	Sweater	\$59.00	#DIV/0!			
6	WTKQ758	Bike	\$599.00	#DIV/0!			
7	SFKS527	Radio	\$25.00	#DIV/0!			
8	OGWT288	Bike	\$599.00	#DIV/0!			
9	TCQN516	Calender	\$3.00	#DIV/0!			
10		Sub-Total	\$1,927.00				
11							
12							
13							
14							
15							

=C2/~~G10~~

Function DIVIDE parameter 2 cannot be zero.

Formula suggestion

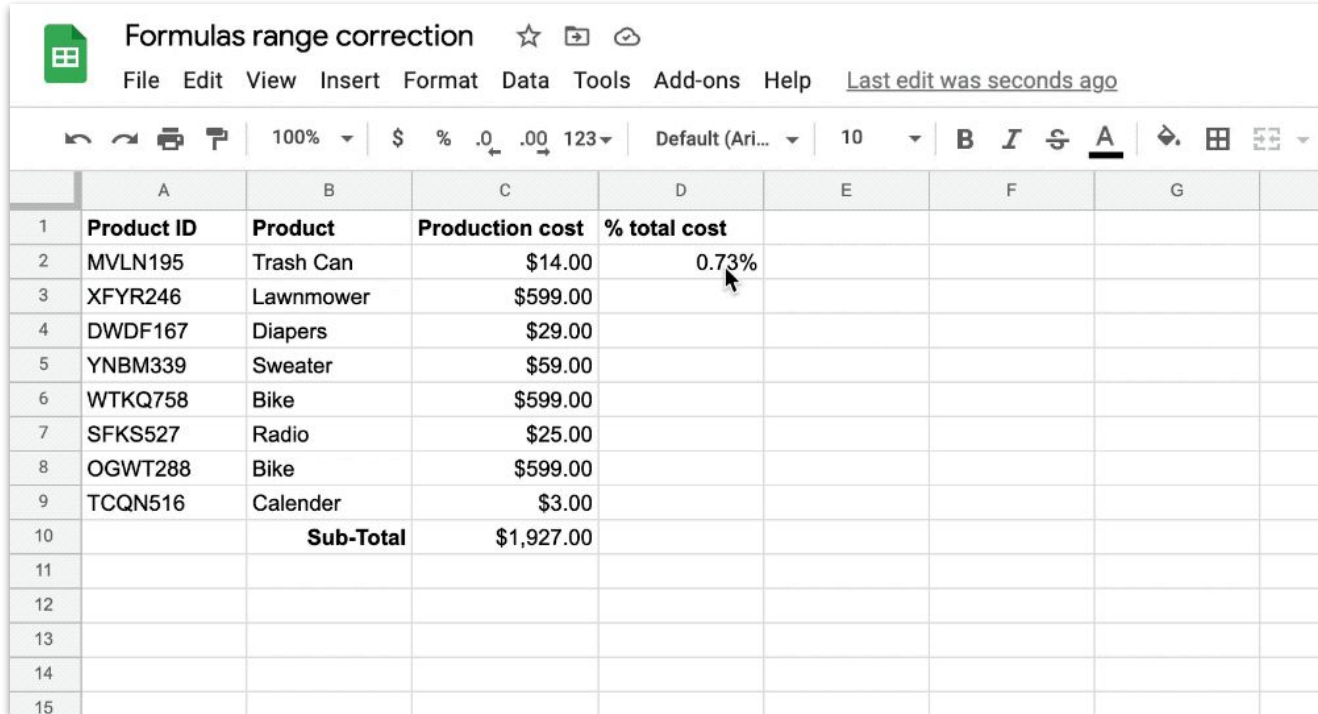
An absolute cell reference (using \$) ensures that the correct cell is referenced on paste.

=C2/**\$C\$10**

Press ⌘+Enter to accept suggestion

✓ ✕

Here it is in action.



The screenshot shows a Google Sheets interface with a spreadsheet titled "Formulas range correction". The spreadsheet contains a table with the following data:

	A	B	C	D	E	F	G
1	Product ID	Product	Production cost	% total cost			
2	MVLN195	Trash Can	\$14.00	0.73%			
3	XFYR246	Lawnmower	\$599.00				
4	DWDF167	Diapers	\$29.00				
5	YNBM339	Sweater	\$59.00				
6	WTKQ758	Bike	\$599.00				
7	SFKS527	Radio	\$25.00				
8	OGWT288	Bike	\$599.00				
9	TCQN516	Calender	\$3.00				
10		Sub-Total	\$1,927.00				
11							
12							
13							
14							
15							

In all, we developed **four types of formula corrections** for common mistakes.



Relative vs. absolute corrections

=F2/~~F11~~
Function DIVIDE parameter 2 cannot be zero.

Formula suggestion
An absolute cell reference (using \$) ensures that the correct cell is referenced on paste.

=F2/~~F~~\$11

Press ⌘+Enter to accept suggestion



Range corrections

=SUM(B2:B~~3~~)

Formula suggestion
Did you mean...

=SUM(B2:B4)

Press ⌘+Enter to accept suggestion

In all, we developed four types of formula corrections for common mistakes.

Leftward VLOOKUP corrections

=~~VLOOKUP(A15, A2:B9, 1, false)~~

Did not find value 'JSW0019' in VLOOKUP evaluation.

Formula suggestion

VLOOKUPs only work to the right. This correction will reverse the columns in your formula.

=INDEX(\$A\$2:\$A\$9, MATCH(A15, \$B\$2:\$B\$9, 0))

Press ⌘+Enter to accept suggestion



VLOOKUP range corrections

=VLOOKUP(A15, ~~A2:G9, 4, false~~)

Did not find value 'JSW0019' in VLOOKUP evaluation.

Formula suggestion

The lookup value is not in the first column of the lookup range.

=VLOOKUP(A15, \$B\$2:\$G\$9, 3, FALSE)

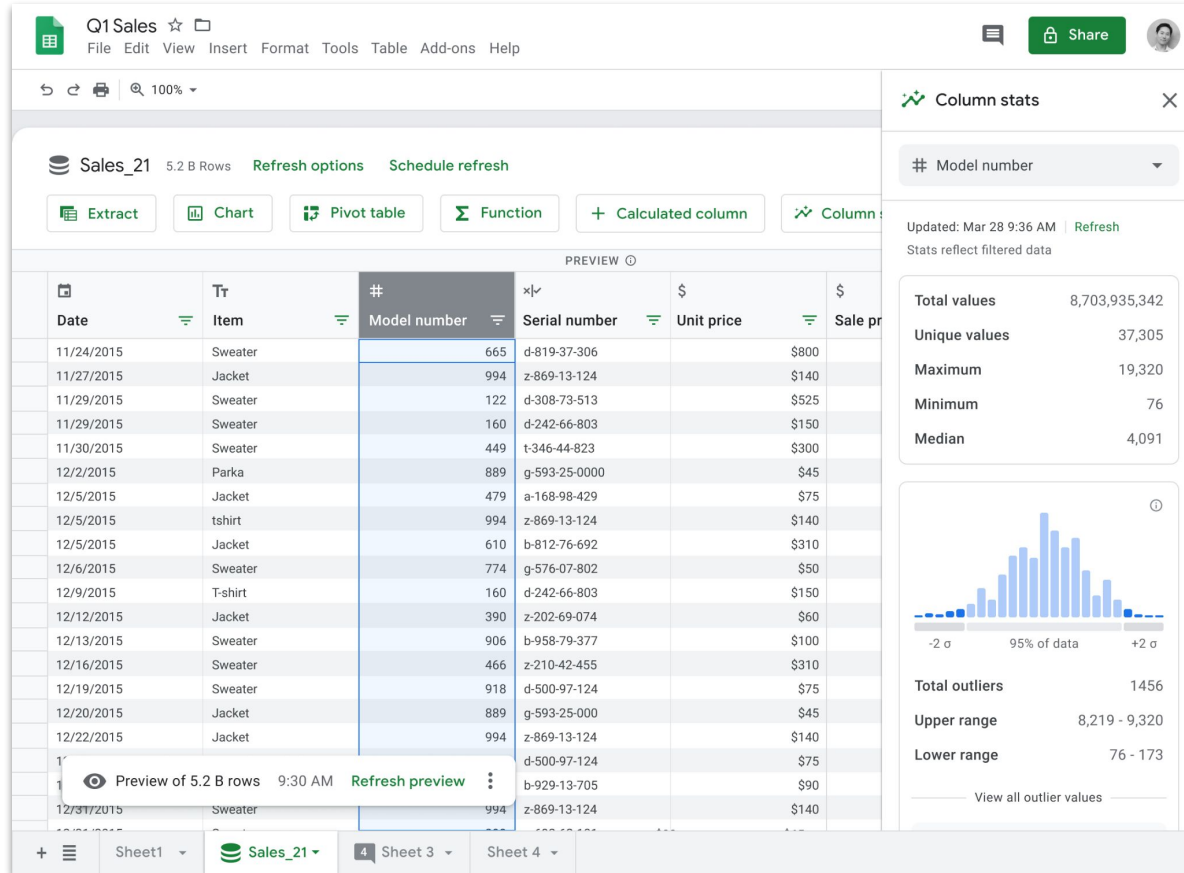
Press ⌘+Enter to accept suggestion



Big Sheets

Scaling Sheets to handle **billions of rows** of data

Big Sheets is a new product that lets analysts work with big data in the familiar UI of a spreadsheet. Users can pull extracts, run calculations, pivot, and build dashboards, all without SQL.

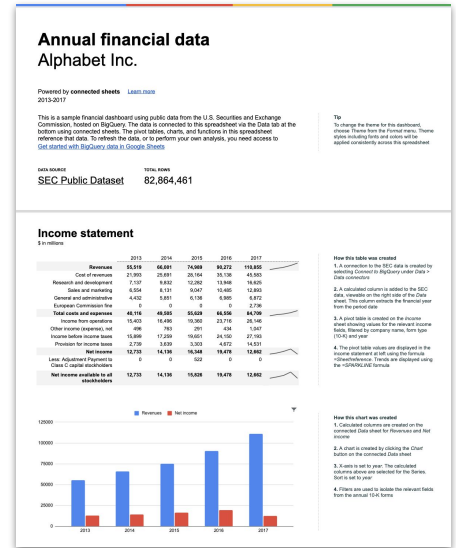
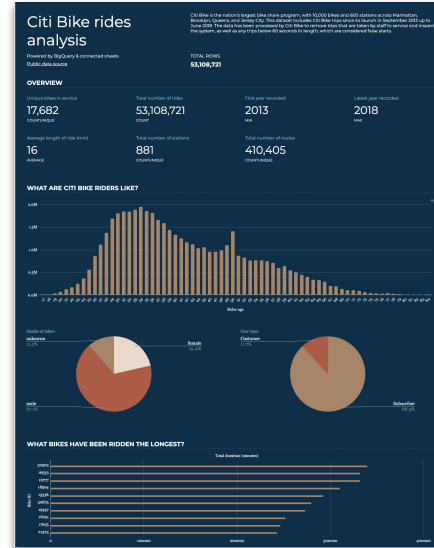
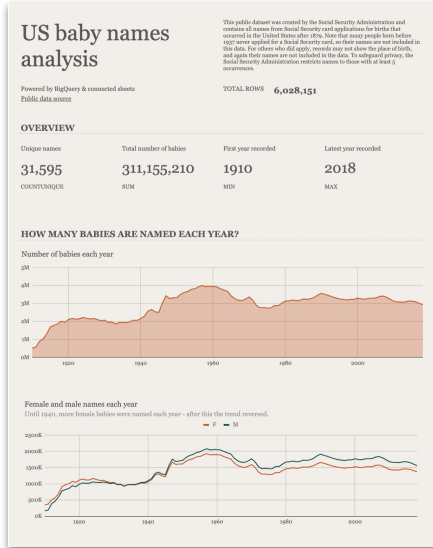
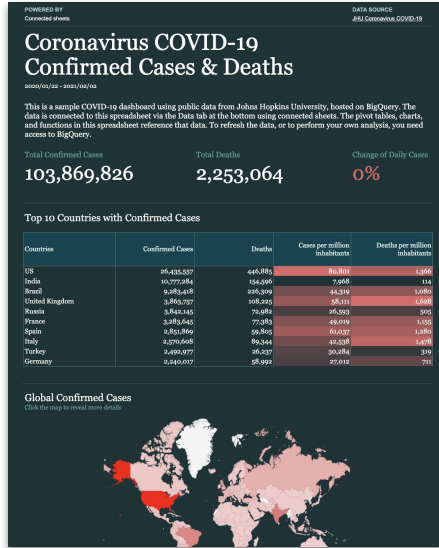


For quick investigations, users can filter down to specific values, directly out of billions of rows.

Because it doesn't make sense to display every row of a massive data set, we provide a 500 row preview. This allows users to understand the shape of the data. From here, the user can filter down and run analysis, including the ability to pull extracts of up to 50k rows.

The tool provides quick column by column summaries, including outlier analysis.

Sample dashboards built with Big Sheets



Every chart, table, and calculation you see here is built atop an underlying big data sheet.

Since launch we've expanded to support Looker, a big data modeling tool acquired by Google, providing access to 50+ additional data sources.

The screenshot shows a Google Sheets window titled "Sales analysis" with a menu bar (File, Edit, View, Insert, Format, Data, Tools, Add-ons, Help) and a toolbar. A modal dialog is centered on the screen, displaying the Looker logo and the message "Successfully connected to your Looker model!". Below the message, it lists capabilities: "You can now:" followed by bullet points: "Access latest Looker data with 5x higher row limit", "Add data from multiple sources like CSV, Looker, BQ", "Accelerate workflow with familiar analysis and chart tools", and "Share analysis easily via integrated Workspace products". At the bottom of the modal is a green button labeled "Start analyzing". The background spreadsheet has two visible tables. The first table, "Age Tier", lists clothing categories and their total sales prices. The second table, "30 to 39", lists metrics like Total Gross Margin, Total Sale Price, and Total Gross Profit.

Sales analysis ☆ 📄 ☁

File Edit View Insert Format Data Tools Add-ons Help Last edit was seconds ago

100% \$ % .0 .00 123 Default (Ari... 10 B I S A

Age Tier 10 to 19

Category Total Sale Price

Jeans	\$659
Accessories	\$394
Outerwear & Coats	\$349
Active	\$251
Fashion Hoodies & Sweatshirts	\$319
Shorts	\$272
Tops & Tees	\$289
Pants	\$218
Blazers & Jackets	\$180
Suits & Sport Coats	\$155
Sweaters	\$174
Dresses	\$165
Swim	\$130
Sleep & Lounge	\$98
Skirts	\$76
Jumpsuits & Rompers	\$78
Suits	\$78
Clothing Sets	\$67
Pants & Capris	\$54
Underwear	\$41
Intimates	\$43
Plus	\$29
Leotards	\$28,668.37
	\$21,023.07
	\$24,841.52

30 to 39

Total Gross Margin	Total Sale Price	Total Gross Profit
48.09%	\$368,240.63	\$177,148.57
62.88%	\$223,580.12	\$140,603.54
55.39%	\$193,039.54	\$107,145.54
58.18%	\$139,716.63	\$81,234.54
44.22%	\$167,633.85	\$74,145.54
49.13%	\$155,508.05	\$76,403.54
44.65%	\$153,372.85	\$68,145.54
53.36%	\$128,009.15	\$68,145.54
62.22%	\$97,103.08	\$60,145.54
59.69%	\$94,181.38	\$56,145.54
52.02%	\$101,767.57	\$53,145.54
54.92%	\$90,855.80	\$50,145.54
53.08%	\$78,939.51	\$42,145.54
55.46%	\$55,958.57	\$31,145.54
59.65%	\$41,014.56	\$24,145.54
46.27%	\$43,112.82	\$20,145.54
40.26%	\$39,739.78	\$16,145.54
37.41%	\$40,416.67	\$15,145.54
47.89%	\$29,773.42	\$14,145.54
52.86%	\$24,376.47	\$12,145.54
48.10%	\$24,863.48	\$11,145.54
50.01%	\$15,627.77	\$7,145.54
40.21%	\$16,401.74	\$6,145.54
55.65%	\$11,258.26	\$6,145.54
38.55%	\$15,351.16	\$5,145.54

Refresh 9:30 AM

Untitled Looker Explore name Pivot table

What Googlers are saying about Elliott

Strong product intuition — Staff Engineer

Elliott is a **clear and direct communicator** and he's pragmatic and action-oriented, so it's easy to work with him — Engineer

Elliott **translates complex concepts simply** — Design Manager

He has the **ability to push the entire team, including eng and product**, to consider the strategic impact of the feature and planned alternatives. He has been a driving force in not just clarifying the overall UX but the general GTM strategy.

— Product Manager

He is a **pleasure to work with** and works very efficiently. He is a great partner! — Program Manager

Elliott is the rare designer who **can easily manage both tactical and strategic projects**, moving from a close attention to detail to broad exploratory work. He's also **not afraid to pivot** when the evidence suggests a better direction.

— Design Manager

His no-frills **agile approach** unlocks a sincere test & learn lifecycle, previously a cultural eng barrier. — Design Manager

Whereas some designers struggle to accept input, Elliott **values feedback strongly** as part of his regular process.

— Design Manager



NYT portfolio (2015)

Resume