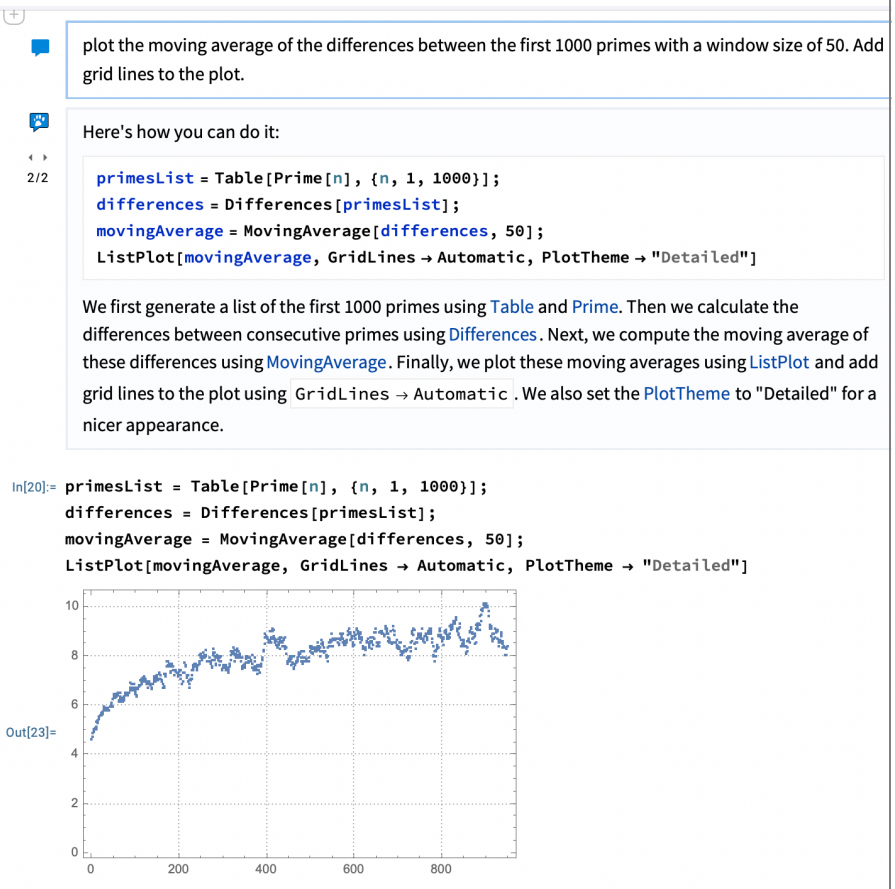
Comparison of Ease-of-Use Features in Mathematica 14 and Maple 2024

Summary

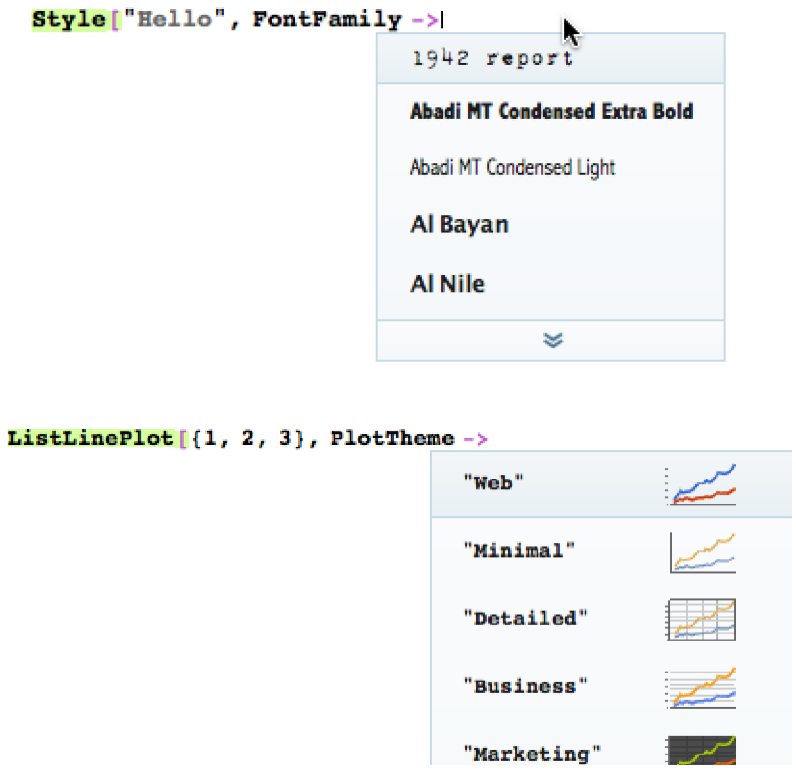
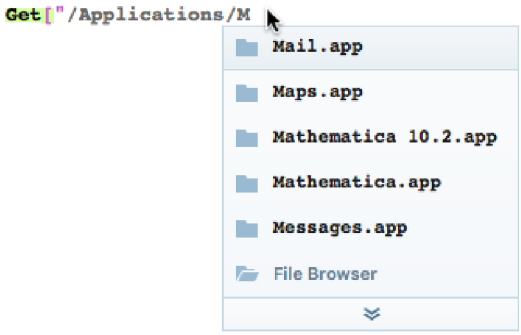
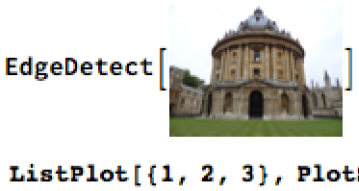
Ensuring ease of operation is particularly important for a system as vast as Mathematica. A steady focus on automation and good user-interface design has meant that Mathematica has become progressively easier to use even as its computational capabilities have grown.

Maplesoft claims that Maple is easier to use than Mathematica, but a systematic cataloging of ease-of-use features shows that Maple supports almost none of the tools, hints or good design principles that are built into Mathematica.

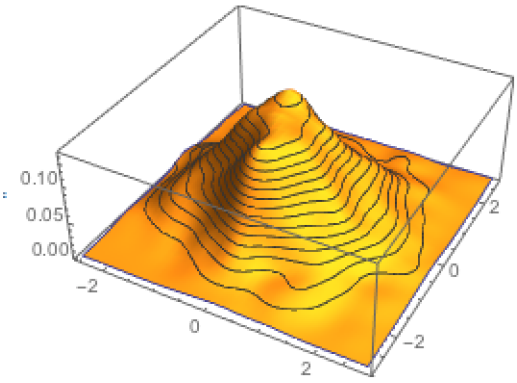
Code editing

Mathematica	Details	Maple
Chat–powered code writing	Use an AI–based chat to help your write code by describing the task in words.  The assistant has live access to Wolfram|Alpha data and the Wolfram Language documentation and can evaluate code. It maintains the context of an ongoing conversation together with the other contents of the notebook.	Maple provides an AI dialog for formula lookup. It is not integrated into its Worksheet, has no conversation history and has no access to live tools.

Mathematica	Details	Maple
AI–powered code feedback	Click on the AI feedback icon next to the input and output and the AI assistant will provide feedback on your code, taking into account the context of preceding calculations. Out[76]= plot[Sin x, {x, 0, 10}] It looks like the Wolfram Language function you're trying to use is not correctly capitalized. The function for plotting is Plot, not *plot*. Also, the argument *x* in Sin (x) should be written as Sin[x] in Wolfram Language. Here is the correct syntax: Plot[Sin[x], {x, 0, 10}] Please try again using this corrected form.	None
Autocompletion: function names	Type the start, middle or abbreviation of a command, and Mathematica automatically provides completion choices. Just press return to save typing the rest. Leas LeastSquares LeastSquaresFilterKernel	Maple returns only matches that start with the given characters
Autocompletion: command templates	Mouse over a command or use a keystroke after typing a command, and you are offered standard usage templates. Select one by mouse or keyboard and then tab between the arguments as you fill them in. Plot Plot[*f*, {*x*, x_{min}, x_{max}}] generates a plot of *f* as a function of *x* from x_{min} to x_{max}. paste Plot[{f_1, f_2, ...}, {*x*, x_{min}, x_{max}}] plots several functions f_i. Plot[{..., *w*[f_i], ...}, ...] plots f_i with features defined by the symbolic wrapper *w*. Plot[..., {*x*} ∈ *reg*] takes the variable *x* to be in the geometric region *reg*.	Maple provides templates only via keyboard access.
Autocompletion: delimiter matching	The matching closing bracket or quotes can be created automatically for you without moving the cursor.	✗
Autocompletion: strings	Start typing a string in a place where there are finite choices, and Mathematica will offer you autocompletions. CountryData["U "UnitedStates" "UnitedKingdom" "Ukraine" "UnitedArabEmirates" "Uruguay"	✓

Mathematica	Details	Maple
Autocompletion: iconic preview	Some autocompletions, such as styles, fonts and colors, are shown with visual cues, so you can see what the effect of the choice will be. 	✗
Autocompletion: path browser	Start typing a file name, and Mathematica helps you navigate your files system. 	Provided only in code–edit regions, not in Worksheets.
Inline evaluation	You can evaluate part of an input expression in place to simplify your input without having to do a side calculation. `data = {1, 2 + 3 + 4 + 5, 6}` → `data = {1, 14, 6}`	✗
Generalized input	You can use any formatted content in Mathematica input, not just typeset math or text. Input can include images, 3D images, geometry, graphs, color swatches and more. Code is easier to write and easier to read. 	✗

Mathematica	Details	Maple

Iconized input	You can collapse large input into an icon that makes your notebooks easier to read while still saving all data in the same file. Use the icon as input, or expand it to see the contents.
	`data = Experimental data ;`
	`SmoothHistogram3D[data]`
	 
		✗

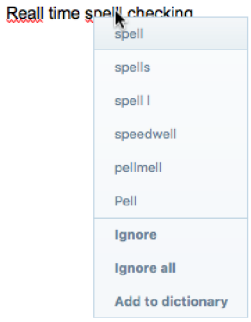
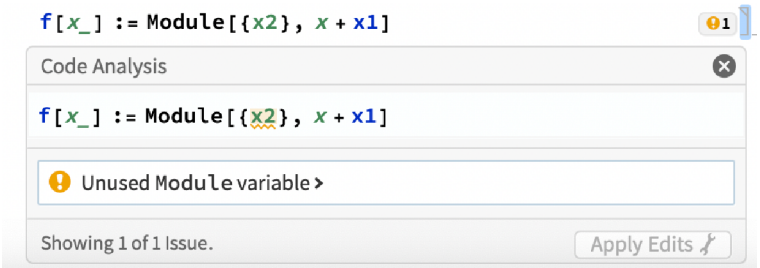
Code reformatting	Apply automated line breaks and indentation to make your code more readable.
	`f[x_]:=If[x≤1,x,If[EvenQ[x],x/2,3x+1]]`
	`f[x_] := If[x ≤ 1, x , If[EvenQ[x], x / 2 , 3 x + 1 ] ]`
		✗

Extend selection	Multi–click inside a math expression or use a keyboard shortcut to extend the selection in a mathematically valid way. $1+\sqrt{2+\frac{3}{4+x}}$ $1+\sqrt{2+\frac{3}{4+x}}$ $1+\sqrt{2+\frac{3}{4+x}}$ $1+\sqrt{2+\frac{3}{4+x}}$	✗
Custom notations	You can create your own 2D mathematical typeset notations for input or output.	✗
Edit during evaluation	In Mathematica, you can continue to edit the working document while long calculations are being performed.	✗

Mathematica	Details	Maple
Customizable input aliases	You can set up your own aliases for any content that you type or insert frequently. These can insert text, typeset math or images. Aliases also appear on the autocompletion prompts. Mathematica comes with a collection of predefined shortcuts. For example, type "ESC del" and the autocompletion shows:  Click on the autocomplete or finish typing "ESC del2 ESC" and the 2D structure using the Del character (Unicode 8711) and placeholders appears in its place: $\nabla^2_{\square}\,\square$	✗

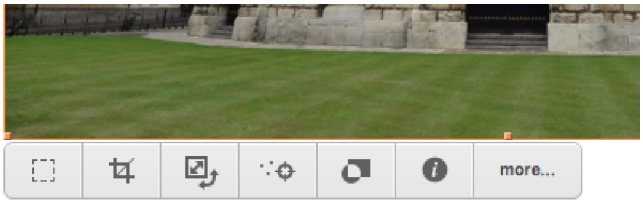
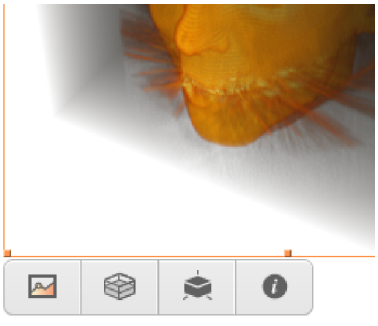
Error detection

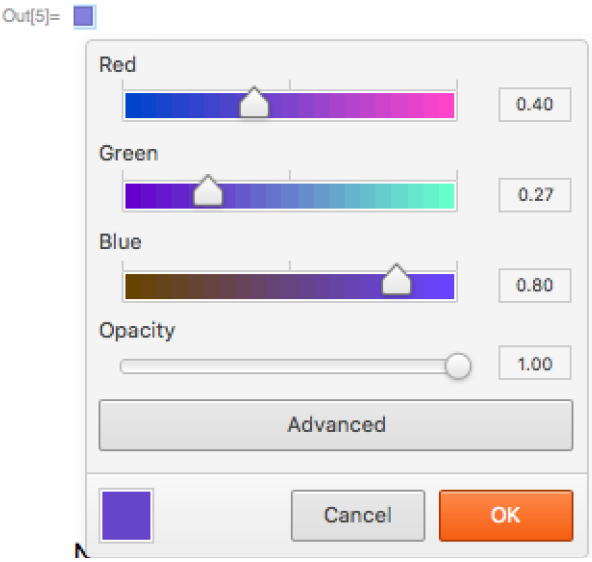
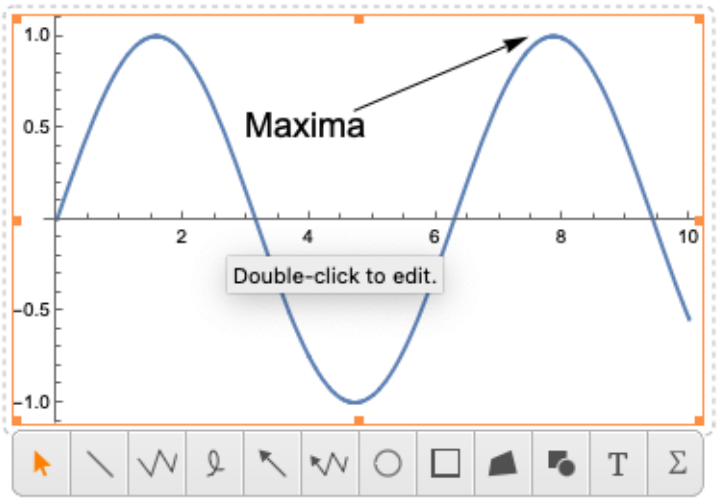
Mathematica	Details	Maple
Syntax coloring: bracket matching	Mismatched brackets are automatically colored to highlight the error. `Sin[x + Cos[x]`	✗
Syntax coloring: missing arguments	Functions that require more arguments than you have provided are highlighted with a marker. `Mod[3,]`	✗
Syntax coloring: excess arguments	If you enter too many arguments for a function, Mathematica highlights the excess arguments. `Sin[2, 3]`	✗
Syntax coloring: undefined symbols	Undefined symbols (usually because you have misremembered or misspelled a function name) are automatically colored blue. `Plott[Sin[x], {x, 0, 10}]`	✗
Syntax coloring: unrecognized options	Mathematica automatically highlights option names that do not apply where you have entered them. `Plot[Sin[x], {x, 0, 10}, PlotArea → 100]`	✗

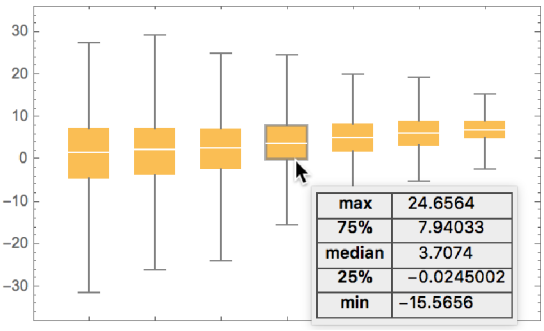
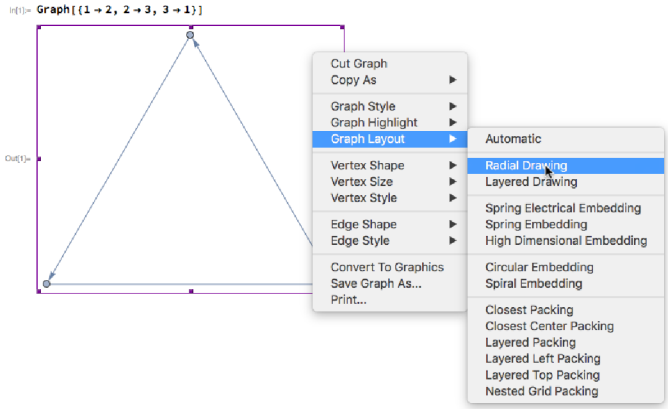
Mathematica	Details	Maple
Syntax coloring: scoping conflicts	If you try to localize the same variable name twice, Mathematica highlights it to warn you. `With[{local = 1}, With[{local = 2}, local]`	Parsing errors are reported in a dialog for code–edit regions only.
Syntax coloring: code comments	Comments are automatically colored gray so that they are easily distinguished from code. `x = 2; (*Comment*)`	✗
Syntax coloring: string content	Strings are colored dark gray to distinguish them in your code. `text = "some text"`	✗
Syntax coloring: current function	The start and end of the function immediately surrounding the cursor are highlighted automatically so that you can more clearly see where you are in complex nested expressions. `Sin[x + Cos[x + 1] + Sin[x] +]`	✗
Number formatting	Mathematica automatically displays long numbers with additional spacing between digit blocks to make them easier to read. `1 234 567 890`	✗
Real–time spellchecking	Mathematica automatically underlines misspelled words as soon as you have typed them. 	In Maple, you must manually invoke spellchecking.
Visual hinting of computation dependency	Both Mathematica's and Maple's interfaces provide REPL interfaces where outputs are displayed alongside inputs. If you edit the input without reevaluating it so the output no longer matches, Mathematica warns you by automatically fading the out–of–date output.	✗
Code analysis	Select code in the notebook and Mathematica will analyze the code for potential errors. In some cases it will offer to correct the code automatically. 	Maple provides command line tools with similar analysis capabilities but not auto–correction.

Mathematica	Details	Maple
Error source feedback	Error messages in Mathematica are accompanied by a “Stack Trace” button that displays information on the computational history that led to the error. 	✗

Interacting with output

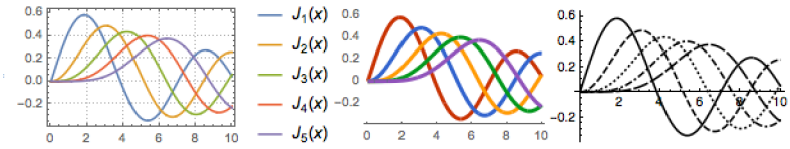
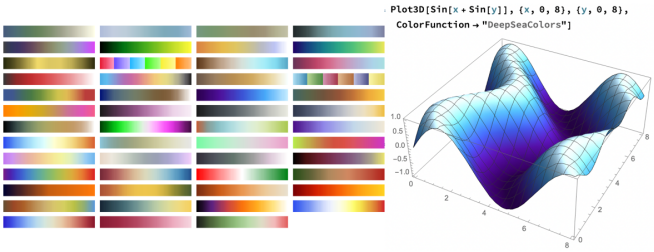
Mathematica	Details	Maple
Image editor	Click any image in Mathematica, and a toolbar automatically appears providing point–and–click tools for selecting regions, cropping, transforming, masking, image information and more. 	✗
Image editor 3D	Click a 3D image (voxel data), and a toolbar appears providing point–and–click tools for coloring, clipping, information and more. 	Maple does not support 3D images.

Mathematica	Details	Maple
Color swatches	Colors appear as visual swatches. Mouse over them for numeric specification, or click them to interact with the values. In[5]:= `Blend[{Darker[Red], Lighter[Blue]}, 0.8]` Out[5]= 	✗
Drawing tools	You can manually annotate graphics and edit generated graphics elements in Mathematica using a drawing tools palette. = `Plot[Sin[x], {x, 0, 10}]` 	✓
Elided forms	Many computations return complex results that are intended as inputs for further computation. Mathematica provides a uniform way to present the key information for these while hiding excess details. For large expressions, you can decide whether all information necessary to repeat the computation is stored in the elided display, automatically linked to a cloud or local storage object or discarded. `InterpolatingFunction` [Domain: {{1., 100.}} Output: scalar] `SparseArray` [Specified elements: 100 Dimensions: {10000, 10000}] `TimeSeries` [Time: 1 to 15 Data points: 6]	Maple provides similar functionality for arrays, audio and graphs only. When Maple presents summary displays, the information to reproduce the output is discarded from the document.

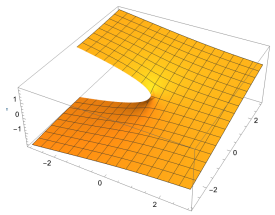
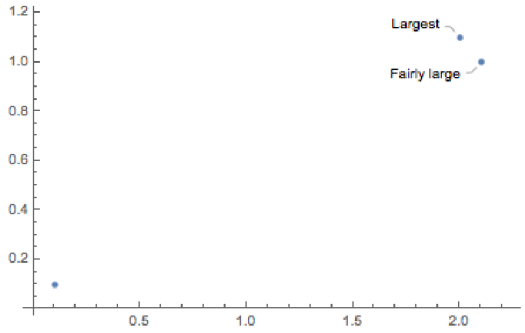
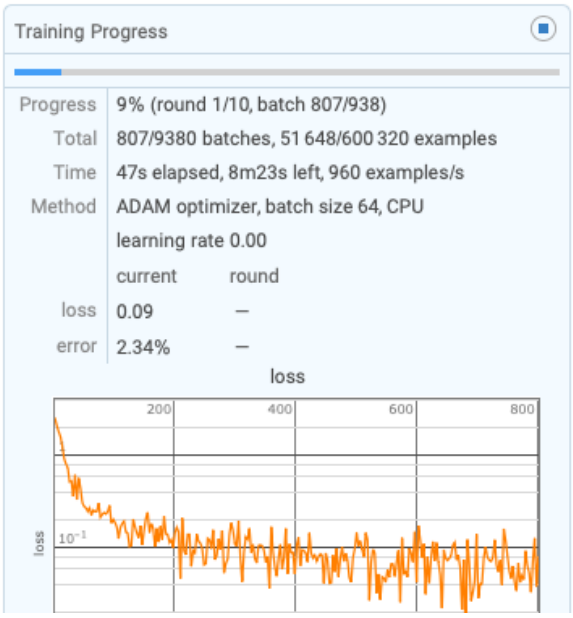
Mathematica	Details	Maple
Large–output suppression	When any very large expression is returned to the notebook, Mathematica automatically presents a compact view that displays the start and end of the expression and an indication of the amount of omitted content. The following example would take around 300 pages to fully display. $\text{Expand}\left[(1+x)^{2000}\right]$ $1 + 2000\,x + 1\,999\,000\,x^2 + 1\,331\,334\,000\,x^3 + 664\,668\,499\,500\,x^4 + 265\,335\,665\,000\,400\,x^5 + 88\,224\,108\,612\,633\,000\,x^6 + 25\,131\,267\,510\,512\,886\,000\,x^7 + 6\,260\,827\,018\,556\,522\,724\,750\,x^8 + \cdots 1984 \cdots + 25\,131\,267\,510\,512\,886\,000\,x^{1993} + 88\,224\,108\,612\,633\,000\,x^{1994} + 265\,335\,665\,000\,400\,x^{1995} + 664\,668\,499\,500\,x^{1996} + 1\,331\,334\,000\,x^{1997} + 1\,999\,000\,x^{1998} + 2000\,x^{1999} + x^{2000}$ large output | show less | show more | show all | set size limit...	✗
Tooltips in graphics	Mathematica graphics incorporate tooltips to provide extra information without increasing the complexity of the image. For example, mouse over a box in a box–whisker plot, and you get statistics on that dataset. 	✗
Context–sensitive menus	The menu that appears when you right–click content depends on the type of content selected. 	✓

Automation & convenience

Mathematica	Details	Maple
Predefined document styles	Mathematica provides over 20 document stylesheets that collect together coherent style choices for title, section, text, math, etc. to let you create a great–looking document quickly. You can also create your own stylesheet.	Maple provides only one stylesheet, though you can create your own.

Mathematica	Details	Maple
Predefined graphics styles	Mathematica provides a collection of predefined styles as an alternative to setting all of the different options separately. `Row[Plot[Evaluate[Table[BesselJ[n, x], {n, 5}]], {x, 0, 10}, PlotTheme → #] & /@ {"Detailed", "Web", "Monochrome"}]` 	✗
Predefined color schemes	Mathematica provides over 170 named color gradients and collections that can be applied to most visualizations. `Plot3D[Sin[x + Sin[y]], {x, 0, 8}, {y, 0, 8}, ColorFunction → "DeepSeaColors"]` 	✗
Automatic hyperlinking	Mathematica automatically converts URLs in text into active hyperlinks.	✗
Automatic reference tracking	Mathematica provides counter objects that track the position of themselves or other content in the notebook to display correct numbering. Objects include Chapter, Section, Subsection, PageNumber and more.	Maple supports only for Equations and Tables.
Automatic code formatting	Mathematica can automatically reformat code using additional line breaks and white space to indent code for easy reading. You can control the balance between code density and “airiness.”	✗
Alternate language cells	Mathematica notebooks can contain Python, SQL, Julia, R, Octave, Ruby or Node.js code cells. Results are automatically converted to Wolfram Language representations. In[1]:= `select * from offices` Out[1]=	✗
TeX input	Enter TeX directly into notebooks and it is formatted immediately using the Wolfram Notebook typesetting.	✗
Plotting: automatic range selection	Mathematica plots can automatically choose their plot ranges to ensure that the majority of the plot yields useful information.	Maple provides this functionality only for 2D plots.
Plotting: automatic resampling	Mathematica adaptively increases sampling in 2D and 3D plots in areas of high curvature to give accurate yet efficient visualizations.	Maple supports this in 2D only

officeCode	city	phone	addressLine1
1	San Francisco	+1 650 219 4782	100 Market Street
2	Boston	+1 215 837 0825	1550 Court Place
3	NYC	+1 212 555 3000	523 East 53rd Street
4	Paris	+33 14 723 4404	43 Rue Jouffroy D'abbans
5	Tokyo	+81 33 224 5000	4–1 Kioicho
6	Sydney	+61 2 9264 2451	5–11 Wentworth Avenue
7	London	+44 20 7877 2041	25 Old Broad Street

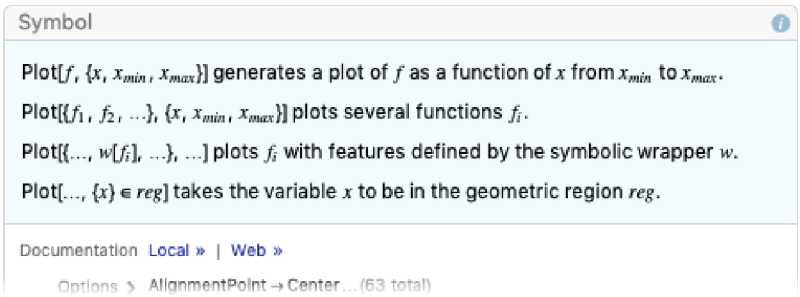
Mathematica	Details	Maple
Plotting: automatic branch–cut detection	Mathematica automatically detects discontinuities in many plots to accurately depict the break. `Plot3D[Im[(x + I y)^0.5], {x, -3, 3}, {y, -3, 3}]` 	Maple provides this functionality only for 2D plots.
Plotting: automatic point sizing	By default, Mathematica automatically makes some features, such as points, smaller if there are many of them in a single visualization.	✗
Plotting: automatic point label positioning	Mathematica can use symbolic wrappers for data points to automatically place labels, callouts or tooltips on plotted points, automatically optimizing their locations to avoid overlap. `ListPlot[{{0.1, 0.1}, Callout[{2, 1.1}, "Largest"], Callout[{2.1, 1}, "Fairly large"]}]` 	✗
Automatic import filters	Mathematica supports over 250 different import and export filters for data, images, sound, video, graphs, geometry and more.	Maple supports 56 formats.
Progress monitoring	Some slow operations, such as training neural networks, provide progress indicators and estimates of completion time. `NetTrain[NetModel["LeNet"], "MNIST"]` 	✗

Mathematica	Details	Maple
Parallel evaluation progress tracking	When performing parallel computations over multiple cores or remote computers, you can see the progress made and the projected completion time. `In[1]:= ParallelMap[PrimeQ[2^#-1]&, Range[9601, 12000]];` During evaluation of In[1]:= ParallelMap Results: 27/56 evaluations of 43 items each (8 kernels) Times: Elapsed: 00m 42s, remaining: 00m 34s, ETA: Mon 22 Nov 2021 09:38:15	✗

Remote batch submission	Once set up with account credentials, Mathematica automates the process of submitting batch evaluations in cloud environments such as Amazon and Azure. Cloud computers are provisioned and provided with Mathematica licenses: tasks are scheduled, results retrieved and instances deleted all with a single command.
	`In[1]:= job = RemoteBatchSubmit[ RemoteBatchSubmissionEnvironment["AWSBatch", ...], 2+2 ]`
	`Out[1]= RemoteBatchJobObject[` Provider: AWS Batch » Job type: Single Job name: RemoteBatchSubmit-SingleJob-0f715240-8b55-45cb-9845-7bd17674dfff AWS Batch job identifier: 8363a62f-cbe0-46a1-9a0f-c4d7a4ba6220 `]`
	`In[2]:= job["EvaluationResult"]`
	`Out[2]= 4`
		✗

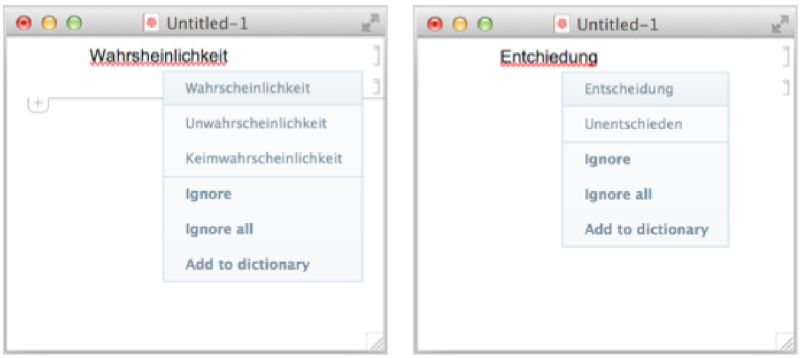
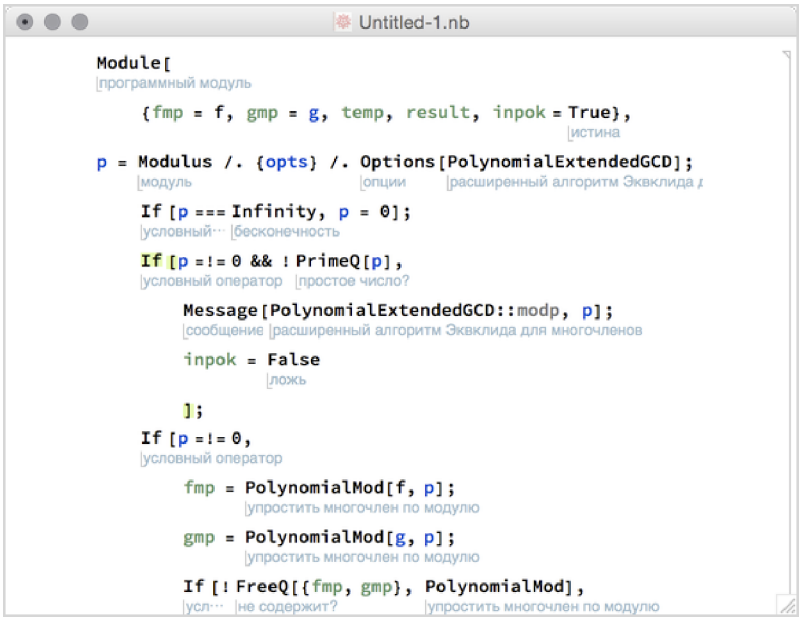
Help

Mathematica	Details	Maple
Evaluatable help	Mathematica help contains over 10,000 examples. The help also acts as a sandbox where you can edit and experiment with the examples in situ, without changing them permanently.	✗
Suggestion Bar	Mathematica automatically suggests calculations you may wish to perform next after each calculation. Just click to perform the action. You can even roll together several steps to automatically write programs. `Out[12]= {0.470063, 0.150947, 0.43559, 0.805856, 0.312563, 0.482064, 0.663087, 0.507534, 0.609561, 0.271254}` total | plot points | histogram | sort | more...	✓
Mouseover help box	Mouse over a command in Mathematica and see a tooltip reminding you what the function does and its typical arguments. `Solve[x^2 == y` **Solve**[*expr*, *vars*] attempts to solve the system *expr* of equations or inequalities for the variables *vars*. **Solve**[*expr*, *vars*, *dom*] solves over the domain *dom*. Common choices of *dom* are Reals, Integers, and Complexes.	✗

Mathematica	Details	Maple
Help on errors	When an error is generated, it includes a hyperlink to documentation on the error, including example causes. In[43]:= **1 / 0** Power::infy : Infinite expression $\frac{1}{0}$ encountered. » 	✗
Command–line help	Evaluating **?name** returns help on **name** without leaving the working notebook. Mathematica displays information in an expandable form that organizes basic definitions, options and attributes with links to the full documentation. **?Plot** 	✓
Natural language input	Type a short English phrase and have Wolfram|Alpha translate it into a Wolfram Language expression. **100 random numbers from 1 to 10** `RandomReal[{1, 10}, 100]` You can even do it in the middle of an expression—for example, to choose the right unit names. 37 h * 13 miles per hour	✗

Mathematica	Details	Maple
Readable function names	While good programming–language design is too complex to summarize in this document, one simple aspect can be seen in the choice of function names. Mathematica uses a consistent set of naming conventions for its functions, mostly using full English words like `FactorInteger`, `LinearProgramming`, `Integrate`, `Counts`, `ContinuedFraction` and `Gamma`, making code readable and names easier to predict. Maple follows this convention for recently added functions, but most of its older functionality is inconsistent in the use of case and abbreviation, making it harder to learn and remember. For example, the Maple equivalents to the above functions are called `ifactor`, `LPSolve`, `Int`, `numboccur`, `cfrac` and `GAMMA`.	

International support

Mathematica	Details	Maple
Local language spellchecking	Mathematica provides real–time spellchecking in over 25 languages. 	Maple has English spellchecking only, and it isn't in real time.
Code captions	Mathematica can automatically display captions over code to clarify its meaning in 12 different languages. 	✗