STATISTICAL PERT®
E S T I M A T I O N   M A D E   E A S Y

Quick Start Guide for *Statistical PERT® Lognormal Edition* **Version 2.0**

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for using a Statistical PERT® spreadsheet.*

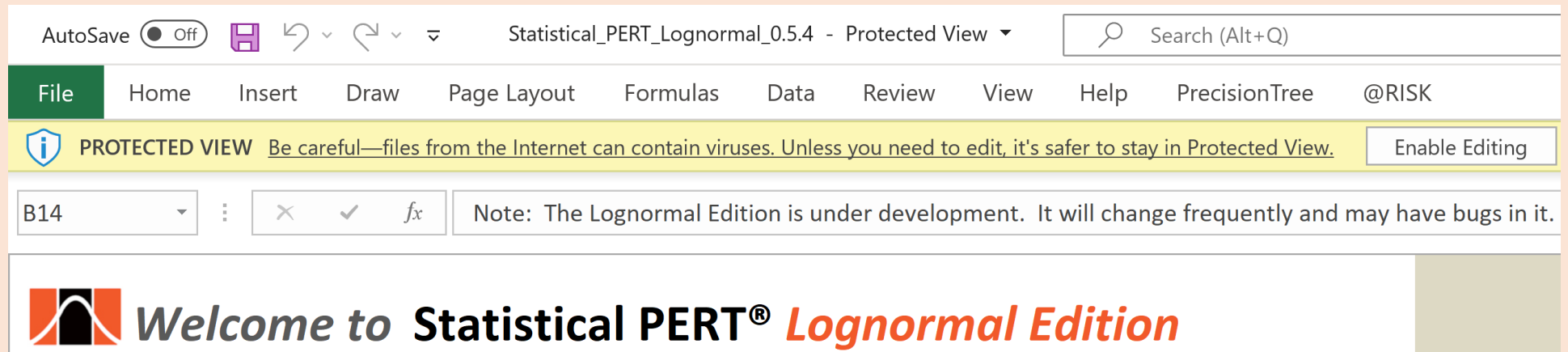# *Quick Start* for using a *Statistical PERT® Lognormal Edition* Excel spreadsheet

Using a Statistical PERT® spreadsheet is easy! First, download the *Statistical PERT® Lognormal Edition* example workbook for Microsoft Excel , and then use this *Quick Start Guide* to understand the basics behind using and modifying your SPERT® spreadsheet.

This Quick Start was created from the **Version 2.0** **Statistical PERT® Lognormal Edition** example workbook. Most Statistical PERT spreadsheets follow the same, basic structure and 3-step estimation process:

1) Create a 3-point estimate (*minimum*, *most likely*—or, with this Lognormal Edition, the *mean*—and *maximum*) for any uncertainty that has bell-shaped risk properties
2) Render a subjective judgment about *how likely* is the uncertainty's most likely outcome
3) Select any probabilistic planning estimate, or make a risk-based forecast using SPERT-created estimates

Before you download the *Statistical PERT® Lognormal Edition* example workbook or template from https://www.statisticalpert.com, be sure you have Microsoft Excel installed on your computer. You must be running Microsoft Excel 2016, Excel 2019, Excel 2021 or Microsoft 365. **Statistical PERT is not compatible with Excel Online, Google Sheets, or other spreadsheet software programs**. It *may* work with limited functionality using Excel 2010 and Excel 2013.

When you first open a downloaded SPERT file from the Internet, the spreadsheet opens to the **Welcome!** tab. Excel may prompt you with a Protected View notice. To use Statistical PERT, you must press the **Enable Editing** button. (You can run your computer's virus-scanner, firstly, if you wish).

Important Note *for using* *Statistical PERT® Lognormal Edition* *Version 1 (and later)*

Version 1 of Statistical PERT® Lognormal Edition includes a the **SPERT® Lognormal MC Simulation** worksheet that uses Monte Carlo simulation to perform 10,000 trials of a single, random variable. <u>Depending on an application-level setting in your version of Excel, Excel may re-simulate 10,000 trials every time any cell is altered on any worksheet.</u> ==This action may noticeably slow down the performance of all Statistical PERT worksheets==, even those worksheets that do not use Monte Carlo simulation.

To improve the performance of all Statistical PERT® Lognormal Edition Version 1 (and later) worksheets, change Excel's formula calculation option to **Automatic Except for Data Tables.** This is an application-level setting—not a file setting—and so you may have to change this setting again if you or another user changes this setting back to **Automatic**.

To make this setting change, do the following:

1) On the Excel Ribbon, identify for the "Calculation" group under the "Formulas" menu selection
2) Click the "Calculation Options" button
3) Select "**Automatic Except for Data Tables**" to increase the speed and calculation performance of all Version 4 SPERT worksheets

Alternatively, if you do not want or need the Monte Carlo simulation worksheet (**SPERT® Lognormal MC Simulation** tab), you can simply delete this entire worksheet. Deleting the SPERT® Normal MC Simulation worksheet will have no impact to the rest of the worksheets in the Statistical PERT Lognormal Edition spreadsheet file.

TL;DR

On the Excel Ribbon, look for the "Calculation" group under the "Formulas" menu selection. Then, click the "Calculation Options" button and select "**Automatic Except for Data Tables**" to increase the speed and calculation performance of all Statistical PERT® workbooks.

Or, simply delete the **SPERT® Lognormal MC Simulation** worksheet from this Excel workbook.

Using the *Super Simple SPERT®* worksheet

The **Super Simple SPERT®** worksheet is the fastest way to learn how Statistical PERT Lognormal Edition works. To begin, think of an uncertainty that has bell-shaped risk properties. That is, think of an uncertainty that has an improbable *minimum* value, an improbable *maximum* value, and a *most likely* value (or *mean*, that is, the average) that lies between the middle between the minimum and maximum values. In cell C3, choose whether you will enter the *most likely* (mode) or the *mean* (average) value in cell C4; then enter that numeric value (for the *most likely* value or the *mean*) in cell C4.

In cell C5, SPERT will calculate a *minimum* value for your uncertainty; check to validate its reasonableness.

In cell C6, SPERT will calculate a *maximum* value for your uncertainty; check to validate its reasonableness.

In cell C7, see if the light indicator is green, yellow or red. Skewed uncertainties will show yellow or red indicators (this is not a problem!).

In cell C10, choose a subjective judgment from the dropdown list that best represents *HOW LIKELY* is the value you specified in cell C4. If this is an uncertainty you are very familiar with, you might select "High Confidence" (or something similar), but if this is an uncertainty you are not familiar with, you might choose "Low Confidence" (or something similar). Your choice will influence the implied, bell-shaped probability curve shown in cell C11, and the SPERT probabilistic estimate in cell C18.

Choose a *planning estimate* in cell C14. A *planning estimate* is any value of interest between your minimum and maximum point-estimates. Once you enter a planning estimate, SPERT will calculate (in cells B16, C16 and D16) the probability of the uncertainty's true value being **equal to** or **less than** your planning estimate, and the probability of the uncertainty's true value being **greater than** your planning estimate.

Choose any probability between 1% and 99% and enter it in cell C17. SPERT will calculate an estimate in cell C18 that will be **equal to** or **greater than** the uncertainty's true value with the probability of occurrence you specified in cell C17 *(when "Show Left-Side Area" is chosen in cell C15; if "Show Right-Side Area" is selected in cell C15, then the uncertainty's true value will exceed the SPERT estimate with the probability of occurrence you specified in cell C17).*

	A	B	C	D	E	F	G	H
1		Statistical PERT® (SPERT®) *Lognormal Edition* Super Simple SPERT®		Click for help				
2		**Think about an uncertain outcome. Then, fill-in the yellow cells, below:**						
3		Are you estimating the **mean** or the **most likely** outcome? →	Mean (Avg)	The mean is the average outcome. The most likely outcome is the mode.				
4		Enter your uncertainty's **mean** (average) or **most likely** (mode) value →	100	What's the most-likely-to-occur value or outcome for your uncertainty?				
5		This is your uncertainty's minimum value →	38	99.9% of possible outcomes will be equal to or greater than this number.				
6		This is your uncertainty's maximum value →	265	99.9% of possible outcomes will be less than this number.				
8		See how skewed your uncertainty is →	●	Green light = slightly skewed. Yellow light = moderately skewed. Red light = very				
10		How confident are you in the **most likely** outcome? →	Medium confidence	Render a subjective judgment (your opinion) about HOW LIKELY the Most Likely				
11		Here's your implied, skewed bell-shaped curve →	(curve)	Based upon your inputs, this is how SPERT models your uncertainty using the log				
14		Enter a **planning** estimate →	150	Your planning estimate is any interesting number between your minimum and m				
15		Choose either the left- or right-side area →	Show Left-Side Area	You can obtain SPERT estimates from either the left- or right-side area of the bel				
16		Your planning estimate of 150 is greater than 94% of all possible outcomes →	94%	6% of all possible outcomes exceed your planning estimate of 150				
17		Enter any percentage between 1% and 99% →	80%	Below, SPERT will calculate an estimate for you				
18		The SPERT estimate of 125 is greater than 80% of all possible outcomes →	125	20% of all possible outcomes exceed the SPERT estimate of 125				

Using the SPERT® Lognormal Edition Example Workbook to estimate duration, expenses, revenue, agile development & more.

To create probabilistic estimates for bell-shaped uncertainties like task duration, expenses, revenue, agile sprints, event attendance, and more, select:

- **SPERT® Lognormal for Beginners** to learn how to use Statistical PERT Lognormal Edition
- **SPERT® Lognormal (Charts)** to auto-generate three-point estimates using just a **single, one-point estimate** for a single uncertainty
- **SPERT® Lognormal (Multi-row)** to model *multiple* uncertainties using the lognormal distribution for each uncertainty
- **SPERT® Lognormal Scheduler** to model a *project's critical path* using the lognormal distribution for each critical path task/activity
- **SPERT® Lognormal (MC Simulation)** to model a single uncertainty using Monte Carlo simulation

Statistical PERT example workbooks and templates are occasionally updated, so you may see differences between this Quick Start and the SPERT file you are using. However, all Statistical PERT spreadsheets operate similarly, so this Quick Start generally applies to any Statistical PERT® Lognormal Edition download, Version 2 and higher (not all features are available on older versions of SPERT).

What's the Difference between the Normal Edition and the Lognormal Edition of Statistical PERT®?

Normal Edition:

- Models bell-shaped uncertainties where the underlying uncertain only has mild-to-moderate skewing
- Uses simple formulas that can be easily written into a blank Excel spreadsheet
- Is better supported with whitepapers, brochures, blog articles, and a Pluralsight training course
- Uses Excel's NORM.DIST, NORM.INV functions for the normal distribution
- <u>Can</u> be easily changed

Lognormal Edition:

- The Lognormal Edition is new; it does not have as many features or support as the Normal Edition
- Models a wider range of bell-shaped uncertainties, including uncertainties that have a long, right-side tail
- All 3-point estimates will use positive numbers; the lognormal distribution cannot create negative values
- Only requires a single point estimate of the uncertainty (either the *most likely (mode)* or the *mean (average)*
- Adapts your inputs to use Excel's LOGNORM.DIST and LOGNORM.INV functions
- <u>Not</u> as easily changed because of the complexities of employing the lognormal functions in Excel

Using the *SPERT® Lognormal Charts* worksheet

On this worksheet, you can model just one uncertainty and see the implied, bell-shaped probability curve (the probability density function):
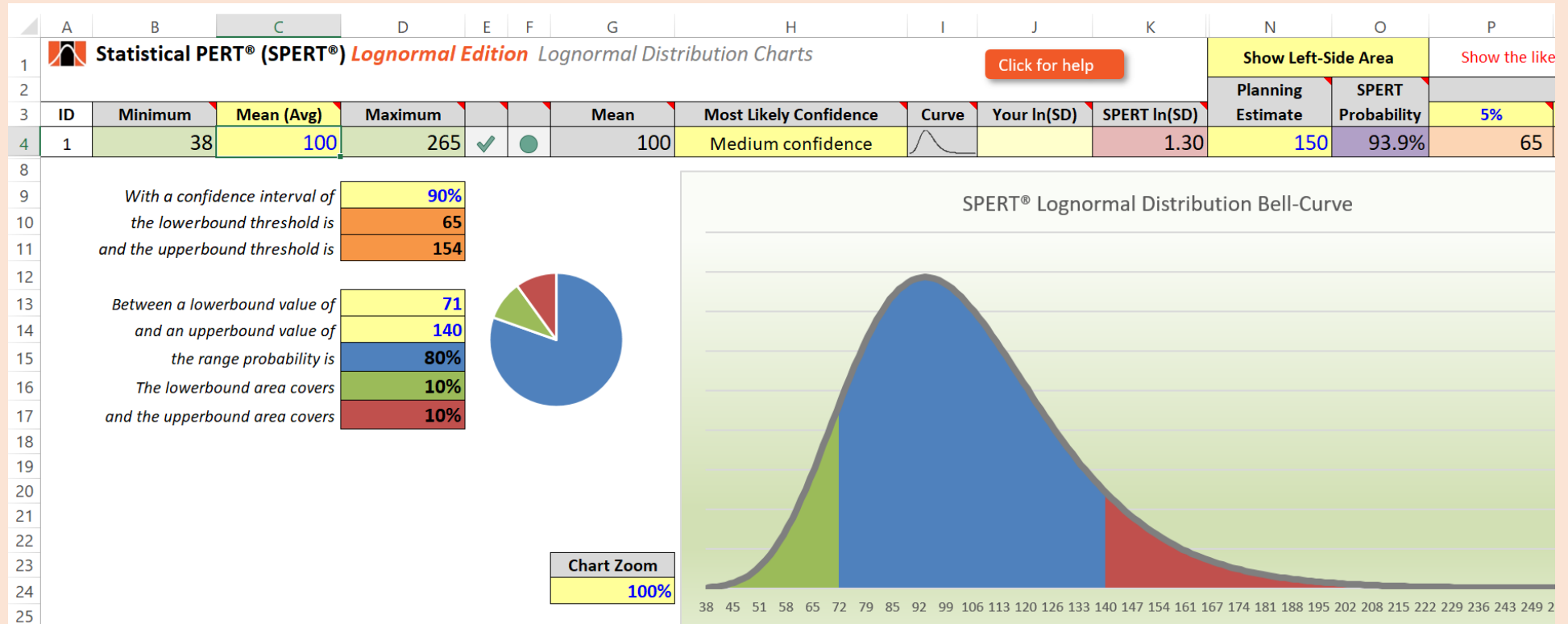
Changing the value in cell C4 (either the *Most Likely* point-estimate or an estimate of the *Mean*) will result in a re-calculation of the uncertainty's minimum and maximum values. Also, changing the *"Most Likely Confidence"* dropdown in cell H4 will recalculate the uncertainty, leading to new values for the minimum, maximum, and the shape of the tri-colored, bell-shaped curve. The areas under the bell-curve are determined by the values in cells D13 and D14, which determine the lowerbound and upperbound thresholds, respectively.

If you cannot see all of the bell-shaped curve within the chart, choose a new value for the Chart Zoom in cell G24.

Using the *SPERT® Lognormal (Multi-row)* worksheet

This worksheet permits you to estimate multiple uncertainties all of which can be modeled using the lognormal probability distribution.

ID	Minimum	Mean (Avg)	Maximum			Mean	Most Likely Confidence	Curve	Your ln(SD)	SPERT ln(SD)	Planning Estimate	SPERT Probability	10%
											Show Left-Side Area		Show the like
1	70	100	143	✔	●	100	Near certainty	⌐		1.10	150	100.0%	89
2	59	100	168	✔	●	100	Very high confidence	⌐		1.15	150	99.8%	84
3	51	100	197	✔	●	100	High confidence	⌐		1.20	150	98.7%	79
4	44	100	229	✔	●	100	Medium-high confidence	⌐		1.25	150	96.5%	75
5	38	100	265	✔	●	100	Medium confidence	⌐		1.30	150	93.9%	71
6	33	100	305	✔	●	100	Medium-low confidence	⌐		1.35	150	91.2%	68
7	29	100	350	✔	●	100	Low confidence	⌐		1.40	150	88.6%	65
8	25	100	398	✔	●	100	Very low confidence	⌐		1.45	150	86.2%	62
9	22	100	452	✔	●	100	Extremely low confidence	⌐		1.50	150	84.1%	59
10	17	100	574	✔	●	100	Guesstimate	⌐		1.60	150	80.6%	55
	388	1,000	3,081			1,000					1,500	99.9%	707
	Unhide rows 13-103 above if you need more rows												
	Do not show currency formatting						*Whole project or portfolio planning estimate*				1,000	50.0%	793

Statistical PERT® (SPERT®) Lognormal Edition Multi-row Entry — Click for help

With **Multi-row** entry, you can enter either the *most likely* or the *mean (average)* point-estimates for each uncertainty. Simply indicate which of these you will be entering by selecting the correct option in the cell C3 dropdown.

Then, enter a single point-estimate for each uncertainty in column C, and select an appropriate "Most Likely Confidence" value that matches your sense that the true value of the uncertainty will be near the point-estimate you entered in column C. When you have higher confidence that the true value will be near your point-estimate, Statistical PERT will select a smaller standard deviation; conversely, when you have less confidence that the true value will be near your point-estimate, Statistical PERT will select a larger standard deviation. The standard deviation will control the shape of the lognormal bell-curve. *(You can control how Statistical PERT converts your subjective judgments into standard deviations through the VLookups worksheet).*

To learn more about how to use this and other Statistical PERT spreadsheets, it is highly recommended you begin learning by interacting with the Statistical PERT **Normal Edition**. *This Quick Start Guide will not cover many features inside the Lognormal Edition that are also found inside the Normal Edition.* [Download the Quick Start Guide for the Statistical PERT **Normal Edition**](#) *to learn more about how this and other Statistical PERT spreadsheets work*

. *Using the SPERT® Lognormal Scheduler worksheet*

This worksheet permits you to model a project's critical path tasks/activities using the lognormal probability distribution.

SPERT® Scheduler	Start & Finish	8/1/2023	9/16/2024							Click for help	
For scheduling the critical path ONLY!	80%		10.7%								
Activity *or* **Task**	Duration Days	Start Date	Finish Date	Minimum	Most Likely	Maximum			Mean	Most Likely Confidence	
Project initiation	5	8/1/2023	8/7/2023	4	5	7	✓	●	5	Near certainty
Business requirements analysis	25	8/8/2023	9/12/2023	9	20	48	✓	●	21	Medium-high confidence
Detail design	20	9/13/2023	10/11/2023	6	15	42	✓	○	16	Medium confidence
Prototype	28	10/12/2023	11/20/2023	7	20	66	✓	○	22	Medium-low confidence
Build solution	106	11/21/2023	5/7/2024	32	80	225	✓	○	85	Medium confidence
Migrate to QA	7	5/8/2024	5/16/2024	2	5	19	✓	○	6	Low confidence
QA user acceptance test	38	5/17/2024	7/12/2024	14	30	72	✓	●	31	Medium-high confidence
Pre-production prep	11	7/15/2024	7/29/2024	6	10	17	✓	●	10	Very high confidence
Production migration	2	7/30/2024	7/31/2024	1	2	3	✓	●	2	Very high confidence
Project closure	11	8/1/2024	8/15/2024	6	10	17	✓	●	10	Very high confidence
If you need more rows, unhide rows 16-103	253			86	197	517			207	
	21	*Optional schedule contingency*								
	274	**Total project duration**			Do not show currency formatting					*Whole project*

With the **SPERT Scheduler,** you can list each critical path task or activity for your project, then estimate each task or activity using the lognormal distribution. Using the lognormal distribution can be advantageous because it provides an easy way to model the likelihood of a project task or activity taking longer than expected. The lognormal distribution can model skewed uncertainties with long, right-side tails.

Begin by listing the names of each critical path task or activity, the **start date** of your project in **cell C1**, and the **reliability** of each duration estimate by entering a probability value in **cell B2**. *Note: the greater the probability, the longer the duration estimate; the lesser probability, the shorter the duration estimate, but the greater likelihood that the task or activity will finish later than scheduled.* Then, indicate whether you will be entering task/activity estimates which are the *most likely* duration or the *average* duration by selecting the correct option in the cell **F3** dropdown. Note: all estimates on this worksheet are presumed to be expressed in days, and **the scheduler presumes a five-day (Monday-Friday) workweek, excluding noted holidays**.

Finally, enter single point-estimates for each uncertainty in **column F**, and select an appropriate "Most Likely Confidence" value that matches your sense that the true value of the uncertainty will be near the point-estimate you entered in column F. When you have higher confidence that the true duration value will be near your point-estimate, Statistical PERT will select a smaller standard deviation; conversely, when you have less confidence that the true duration value will be near your point-estimate, Statistical PERT will select a larger standard deviation. The standard deviation will control the shape of the lognormal bell-curve. *(You can control how Statistical PERT converts your subjective judgments into standard deviations through the VLookups worksheet).* Once you have entered these inputs, the SPERT Scheduler will calculate a project finish date in cell D1. Note that it respects any holidays (non-work days) in the table found on this worksheet.

Using the *SPERT® Lognormal MC Simulation* worksheet

On this worksheet, you can model just one random, independent variable **using Monte Carlo simulation** and see the implied, bell-shaped probability curve (the probability density function):
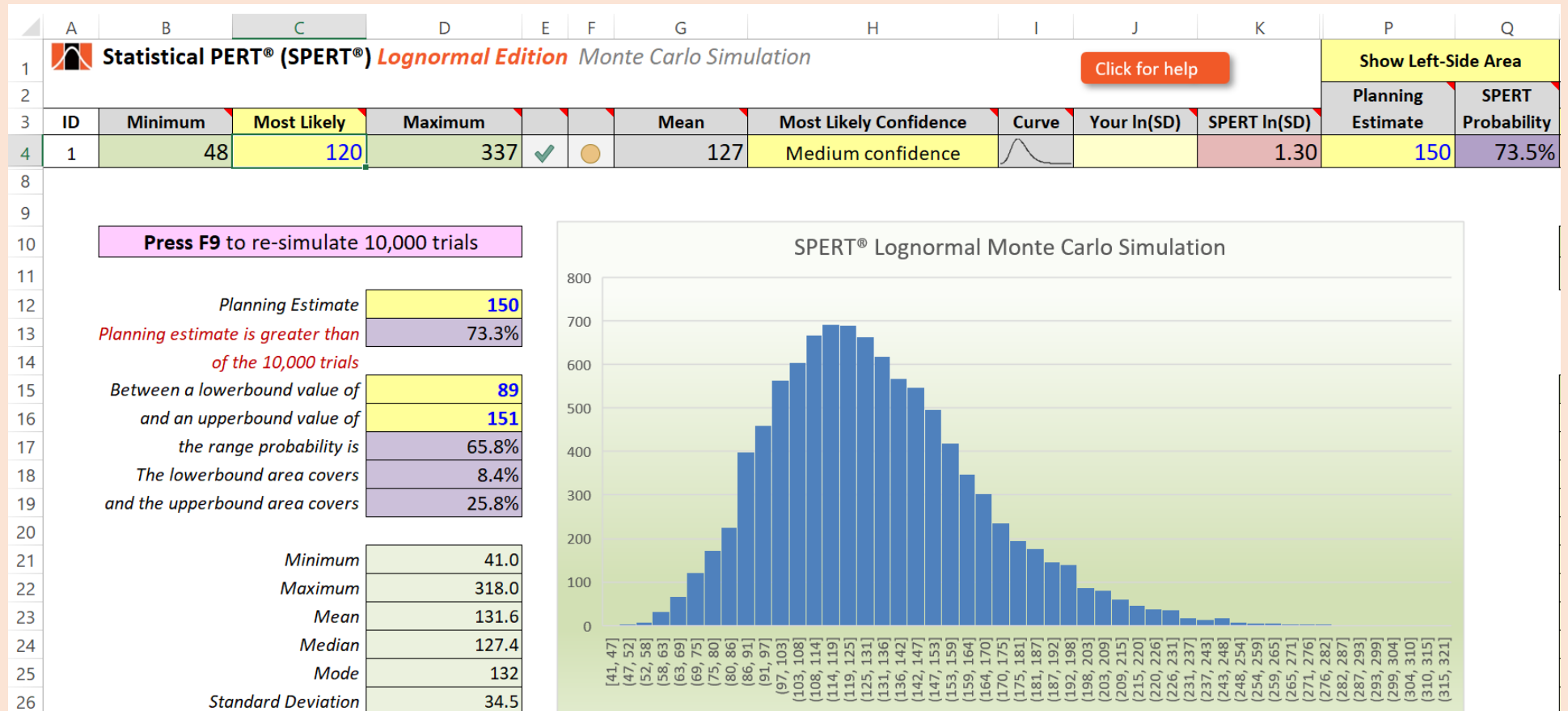
The Monte Carlo simulation uses an Excel data table to sample 10,000 trials of the uncertainty with the characteristics you specified. To re-simulate, **press F9**. If the Statistical PERT spreadsheet appears sluggish on other worksheets, underline check the Excel formula calculation option and set it to "**Automatic Except for Data Tables**". This is an application-level setting.

Note: This worksheet uses Excel's built-in Histogram chart introduced with Excel 2016. Excel 2010 and 2013 users will instead see an error message inside the histogram chart box. Statistical PERT stopped supporting Excel 2010 and Excel 2013 in October 2021 with Microsoft's release of Excel 2021.

Using the VLookups worksheet

On this worksheet, you can manipulate the configuration settings that Statistical PERT uses to model uncertainty using Excel's lognormal distribution functions (LOGNORM.DIST and LOGNORM.INV). In most cases, you will not need to change these settings; they should only be changed by advanced users.

	A	B	C	D	E	F
1	**Statistical PERT® (SPERT®)** *Lognormal Edition* VLOOKUP lists of values					
2						
3	**SPERT Most Likely Subjective Terms**	**Mode**	**LN(SD)**			
4	Near certainty	1.01	1.1			Dropdown va
5	Very high confidence	1.01	1.15			Ratio scalers
6	High confidence	1.03	1.2			
7	Medium-high confidence	1.045	1.25			*The Mode ratio scales were*
8	Medium confidence	1.06	1.3			*which was used to calibrate*
9	Medium-low confidence	1.08	1.35			*bell-curve whenever you en*
10	Low confidence	1.1	1.4			*use the log mean and log st*
11	Very low confidence	1.12	1.45			*for you if you choose to ent*
12	Extremely low confidence	1.14	1.5			
13	Guesstimate	1.24	1.6			*The LN(SD) values are spec*
14						*interval obtained using thes*
15						
16	**SPERT *Most Likely* or *Mean* Choice**					
17	Most Likely	TRUE				
18	Mean (Avg)	FALSE				
19						
20						
21	**Minimum and Maximum *X* values**					
22	Minimum *X* value probability	0.00010		*This is the percentage decimal of the value of X th*		
23	Maximum *X* value probability	0.99990		*This is the percentage decimal of the value of X th*		

Get More Information on *Statistical PERT®*

There are many ways to get more information about Statistical PERT. Visit the Statistical PERT website at https://www.statisticalpert.com and click on the Learn More tab to get more information about Statistical PERT. Also, click on the News & Blog tab to get access to blogs and new information about Statistical PERT.

Have any Questions? Find a Bug? Want to Connect?

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