Math Simulator V3: Expanded Bonus Game Edition

Input Requirements:

An excel spreadsheet in xlsx format is required for input. The game should be represented by groups of three weighted sheets, The ‘spins’ sheet (referred to as the ‘trigger sheet’ for the first, main game), the ‘lines’ sheet (representing how many paylines the spin ‘won’), the ‘pays’ sheet with the winning amounts. Even in a ‘pick bonus’ situation, all three sheets need to exist in order, and contain at least one entry with appropriate columns. The spreadsheets included in the ./assets/ folder have representations of those formats. Finally, there is a ‘Math Values’ sheet for things like calculated Volatility, calculated Return To Player (RTP).

1: the sheet order matters. That's how we're making this dynamic. so:
2: there are three sheets per 'game', or bonus, or whatever else.. it will always use, in order: a 'spins' sheet(which can have one line and a header), a 'lines' sheet(also can just be a header and a row with the appropriate values), and a 'pays' sheet.. much the way we've been doing it. each set of 3 are treated like a full bonus game, after the initial one.
3: the first page, the 'spins' for the main game, determines bonus games. the names of the sheets, nor the names of the lines itself, matter. the only 'named' pieces I'm using so far are the 'lower range' and 'upper range' columns, otherwise I'm assuming that:
4: the first four columns matter, and in order will be
a) the lines/wins column.. whatever value we need goes there (like payouts, or line wins)
  I) this is expected to be an integer for the ‘lines’ and the ‘wins’ sheets
b) weights - currently ignoring it, but it's counting it as one of the four columns, and in the original spreadsheets were used to automatically build the Lower Range / Upper Range table.
c) a 'Lower Range' column, and
d) an "Upper Range" column.. (as we're using these to do the random numbers against)

Addtl:
We’re currently using “Math Values” as a sheet name.
The RTP/volatility page is optional, to display those values; but they'd need to be named however-we-decide and then kept at the 'end'.. also noting: no hidden sheets at the beginning of the excel sheet list.

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Math Volatility: multiple tables means the mean_payout that we calculated is incorrect and must be recalculated.

Volatility is $\sigma_T = \sigma\sqrt{T}$

σ_T =volatility over a time horizon
σ =standard deviation of returns
T =number of periods in a time horizon

$$\mathrm{SD} = \sqrt{\frac{\sum |x - \bar{x}|^2}{n}}$$

Standard Deviation looks like this.
Step 1: Find the mean.
Step 2: For each data point, find the square of its distance to the mean.
Step 3: Sum the values from Step 2.
Step 4: Divide by the number of data points.

https://www.casinocitytimes.com/john-robison/article/ask-the-slot-expert-calculating-a-slot-machines-volatility-65781

So, for our purposes:
The mean shall then be populated by the total wins on each table, divided by the total entries. We'll to this at the end of the 'load excel' function, as it's the most logical place to calculate the mean: once the info from the tables has been parsed, but before the calculation is needed during game play. The mean will be the calculated sum of all the possible win values, divided by the total number of entries of all pay tables (denoted paysheet#, 1 being the main game, 2+ being bonus games.

The summation occurs during each game. There are two places this is possible, during play or at the end, using the list of play outcomes. The summation is the "distance" of the mean to the outcome, squared (so signs don't matter). This is the top piece of the formula inside the square root. Summation, meaning adding those progressive results together.

At the end of the simulation, we have total spins (we actually have his at the outset, in the simulator tkGui settings.. So we divide the summation by the total. Then take it's square root to get the Standard Deviation. This is then applied to the Volatility Index by multiplying with the predetermined modifier of 1.96. (this came from our math person)