Math Simulator v2 - Game Fit Model

Development document

Description

We need another variant of the math simulator, where instead of reel based, we build rng based on weighted tables. Take in an excel sheet, process the 'game', run the 'simulator' a determined number of times, and record the output wins in a simulator output file, along with displaying the resulting math. We will need to keep track of credits, and allow for infinite credits as well.

Requirements

Install python 3

Using the python installer program, pip, install the following packages:
$ pip install openpyxl xlsxwriter xlrd tk pandas numpy

Design

Overview

We want to take in an excel file with the paylines and pay tables, run a random number, and if it wins, run another random number for the pay table for each # of wins from the first table, and for each determine the win amount further based on a weighted table. If the winning process shows a bonus, or an additional spin mechanism, then further determine the outcomes dynamically, based on the logic required.

General Algorithms

Read file to get pay tables:
    Thoughts and speculations:
        We could perhaps use a deterministic schema to show what kind of extras/bonuses..
        I other words:

Credits
Total bet, total lines, and keeping a running track of credits … (disable on 'infinite' credits?)

Math
RTP = total win / total bet
Hit percentage = total times a win happened during a spin / total spins

GUI elements

Input file and dialogue
Output file and dialogue
Input parameters: bet per line, spins, credits

Input

Within the gui: total spins, total bet / line

An excel file, with the following specifications:

For Paytable:
"Win Lines" sheet with columns "Win Line", "Weight", "Lower Range", and "Upper Range" -
preferably with no spaces in the names.

For Bonus Game:

For GUI elements / Math:
RTP, Volatility?

Algorithm

Read in the inputs - preload the pay table, the bonus games, the free spins, the pick bonus data
frames/tables.
Randomly pick a number, and run it against the pay table's lower and upper range elements.

If it's a pick bonus, award it from the table

Output

We want an output file that captures the total win amount for each spin, up to 10 million. The win amount should be in pennies.

Like:

spin	Total win
1	0
2	25

Additionally, we want to show the calculated hit percentages (hit-or-not for each spin, added together and divided by total spins) as well as the RTP (Total winnings / total wagered)

Notes