Galton Board Experiment

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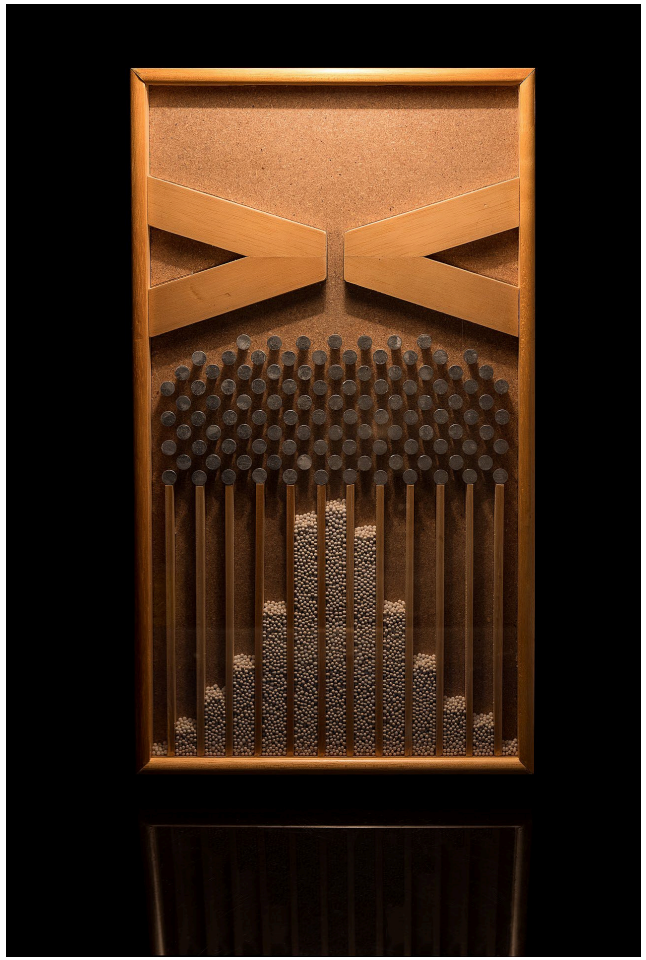
What is Galton board?

- The Galton board, also known as the Galton box or quincunx or bean machine (or incorrectly Dalton board), is a device invented by Francis Galton to demonstrate the central limit theorem, in particular that with sufficient sample size the binomial distribution approximates a normal distribution.



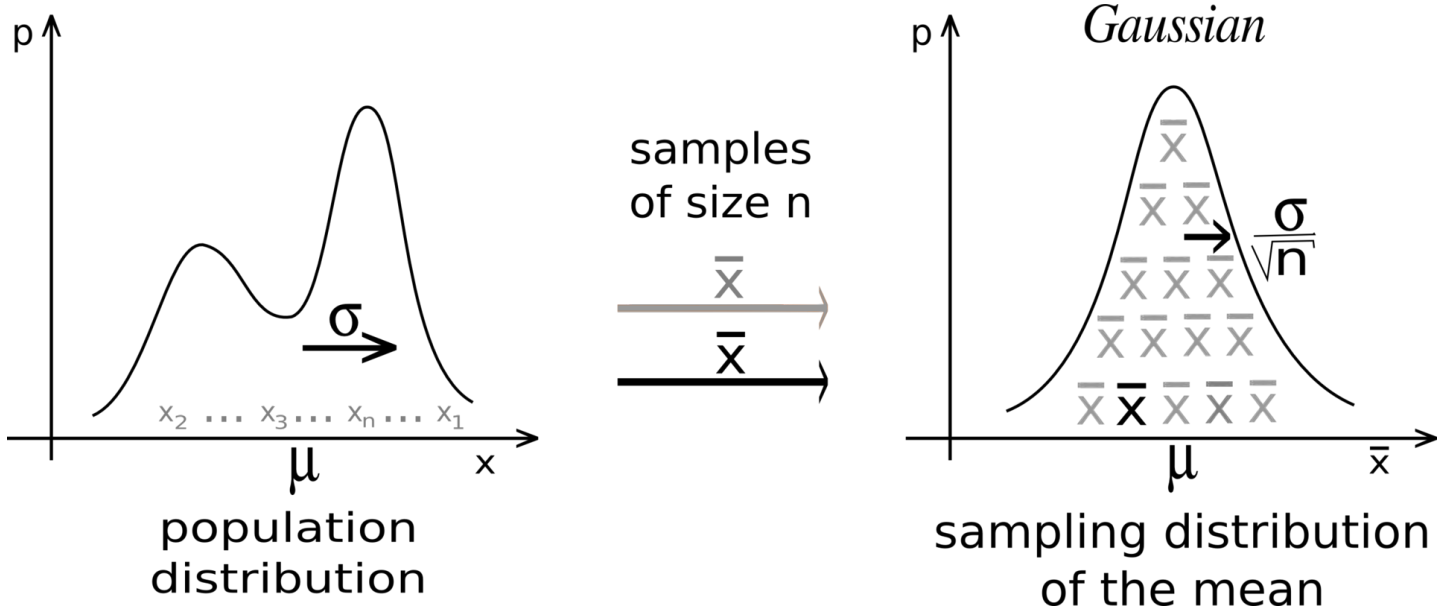
Description

- The Galton board consists of a vertical board with interleaved rows of pegs. Beads are dropped from the top and, when the device is level, bounce either left or right as they hit the pegs. Eventually they are collected into bins at the bottom, where the height of bead columns accumulated in the bins approximate a bell curve. Overlaying Pascal's triangle onto the pins shows the number of different paths that can be taken to get to each bin.

Before and after the spin

Central limit theorem

- In probability theory, the central limit theorem (CLT) states that, under appropriate conditions, the distribution of a normalized version of the sample mean converges to a standard normal distribution. This holds even if the original variables themselves are not normally distributed. There are several versions of the CLT, each applying in the context of different conditions.



Reference

- Wikipedia. (n.d.). Galton board. Retrieved April 1, 2025, from https://en.wikipedia.org/wiki/Galton_board
- Wikipedia. (n.d.). Central limit theorem. Retrieved April 1, 2025, from https://en.wikipedia.org/wiki/Central_limit_theorem