Formula breakdown; The Search for Positive Expectancy

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| Initially, an individual invests $x, allocating a portion (k) of their portfolio into a two-outcome investment scenario. A successful outcome yields S, resulting in a portfolio value of (1 + kS). Conversely, failure leads to a loss of F, resulting the portfolio's value to be reflected as (1 – kF).  The probability of success is denoted as w. After an iterated series of capital allocation retaining the constant fraction of a participants portfolio/bankroll (k), where there is a sufficiently sample size to produce a normally distributed simulations of A) probability of success and B; average payout.  Over (n) iterations, the investor is projected to achieve (w \* n) “successes”/ hit rate and ((1 – w)n) losses, culminating in a portfolio P worth:  A screenshot of a computer  Description automatically generated  Ultimately, the objective is to determine the fraction (k) that optimizes portfolio growth over time. |