

The binomial distribution gives the discrete probability distribution $P_p(k|N)$ of obtaining exactly k successes out of N trials where the result of each trial is true with a probability of p and false with a probability of $q = 1 - p$.

$$P_p(k|n) = \binom{N}{k} p^k q^{N-k}, \quad (1)$$

$$= \frac{N!}{k!(N-k)!} p^k (1-p)^{N-k}, \quad (2)$$

where $\binom{N}{n}$ is a binomial coefficient.

We can find $P =$ “the probability that 10 or less users are active.” Then $1 - P =$ “ the probability that more than 10 users are active.” We find P as

$$\sum_{k=0}^{10} \binom{35}{k} p^k q^{N-k} \quad (3)$$