Theorem:

Expected # of probes in a miss $= \frac{1}{1-\lambda}$ ← load factor

Find an empty cell

Proof:

$P(\text{selecting an empty cell}) = P = 1-\lambda$ ← prob of success

$P(\text{selecting non-empty cell}) = \lambda = 1-p$ ← prob of failure

Finding an empty cell ← Coin toss.

probes → random variable X.

Geometric Prob. distribution

$$E(\#\text{ probes in a miss}) = \frac{1}{\text{Prob of success}} = \frac{1}{1-\lambda}$$