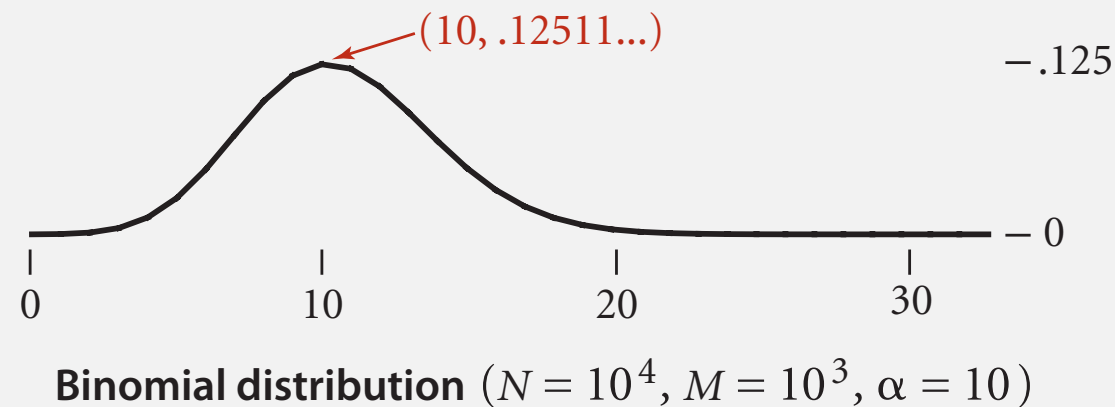Proposition. Under uniform hashing assumption, prob. that the number of keys in a list is within a constant factor of N/M is extremely close to 1.

Pf sketch. Distribution of list size obeys a binomial distribution.

$(10, .12511...)$

$-.125$

-0

0	10	20	30

Binomial distribution $(N = 10^4, M = 10^3, \alpha = 10)$

`equals()` and `hashCode()`

Consequence. Number of probes for search/insert is proportional to N/M.

- M too large $\Rightarrow$ too many empty chains.
- M too small $\Rightarrow$ chains too long.
- Typical choice: $M \sim N/4 \Rightarrow$ constant-time ops.

M times faster than sequential search