Poisson:

P ( X = j ) ≈

* P(X = j) - The probability that a specific slot in the array ends up with exactly j elements
* e – Euler’s number, approximately 2.71828.
* j is the number of elements that land in a single hash table slot

Expected number of slots with j items=512 \*

0 elements ≈ 512 \* = 512 \* ≈ 188

1 element ≈ 512 \* = 512 \* ≈ 188

2 element ≈ 512 \* = 512 \* ≈ 94

3 element ≈ 512 \* = 512 \* ≈ 32

4 element ≈ 512 \* = 512 \* ≈ 8

5 element ≈ 512 \* = 512 \* ≈ 2

6 element ≈ 512 \* = 512 \* ≈ 0

Maximum collisions using Stirling’s approximation:

K! ≈ ≤ 2N

N =512

Try k = 1,2,3,4,5,6,7

1! = 1 ≤ 1024

2! = 2 ≤ 1024

3! = 6 ≤ 1024

4! = 24 ≤ 1024

5! = 120 ≤ 1024

6! = 720 ≤1024

7! = 5040 > 1024

maximum collisions per slot is around **6**