Bloom Filter Analysis
Table of False Positives

Storage Bytes	Bits n/m	k->				Computer Execution Time Number of Hashes per List Elemer		
	|	2	3	4	5	6	7	8
0.5	4	15.4818%	14.6892%	15.9661%	18.4908%	21.9831%	26.2840%	31.2451%
1	8	4.8929%	3.0579%	2.3969%	2.1679%	2.1577%	2.2930%	2.5492%
1.5	12	2.3568%	1.0823%	0.6457%	0.4595%	0.3711%	0.3294%	0.3142%
2	16	1.3807%	0.4998%	0.2394%	0.1392%	0.0935%	0.0702%	0.0574%
2.5	20	0.9056%	0.2703%	0.1080%	0.0530%	0.0303%	0.0196%	0.0140%
3	24	0.6393%	0.1622%	0.0555%	0.0235%	0.0117%	0.0066%	0.0042%
3.5	28	0.4752%	0.1049%	0.0314%	0.0117%	0.0051%	0.0026%	0.0015%
4	32	0.3671%	0.0717%	0.0191%	0.0063%	0.0025%	0.0011%	0.0006%
4.5	36	0.2920%	0.0511%	0.0122%	0.0037%	0.0013%	0.0005%	0.0002%
5	40	0.2379%	0.0377%	0.0082%	0.0022%	0.0007%	0.0003%	0.0001%
5.5	44	0.1975%	0.0286%	0.0057%	0.0014%	0.0004%	0.0001%	0.0001%
6	48	0.1666%	0.0222%	0.0041%	0.0009%	0.0003%	0.0001%	0.0000%
6.5	52	0.1424%	0.0176%	0.0030%	0.0006%	0.0002%	0.0001%	0.0000%
7	56	0.1231%	0.0142%	0.0023%	0.0005%	0.0001%	0.0000%	0.0000%
7.5	60	0.1075%	0.0116%	0.0017%	0.0003%	0.0001%	0.0000%	0.0000%
8	64	0.0947%	0.0096%	0.0013%	0.0002%	0.0001%	0.0000%	0.0000%

Example

Probability of False Positive = .01%
List = 100,000 Elements
Optimal number Of Hashes to Minimize Storage
4Bytes/Element → 400Kb with 5 Hashes

Pfa = (1-C^(km))^k ~(1-e^(-km/n))^k
where C=(1-1/n)

Note: This used the approximation

nts

9	10	11	12	13	14	15
36.6998%	42.4644%	48.3507%	54.1815%	59.8040%	65.0979%	69.9786%
2.9224%	3.4191%	4.0509%	4.8326%	5.7799%	6.9085%	8.2323%
0.3170%	0.3339%	0.3638%	0.4070%	0.4647%	0.5389%	0.6322%
0.0505%	0.0470%	0.0459%	0.0466%	0.0488%	0.0526%	0.0579%
0.0108%	0.0089%	0.0078%	0.0071%	0.0068%	0.0067%	0.0068%
0.0029%	0.0021%	0.0017%	0.0014%	0.0012%	0.0011%	0.0010%
0.0009%	0.0006%	0.0004%	0.0003%	0.0003%	0.0002%	0.0002%
0.0003%	0.0002%	0.0001%	0.0001%	0.0001%	0.0000%	0.0000%
0.0001%	0.0001%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
0.0001%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%