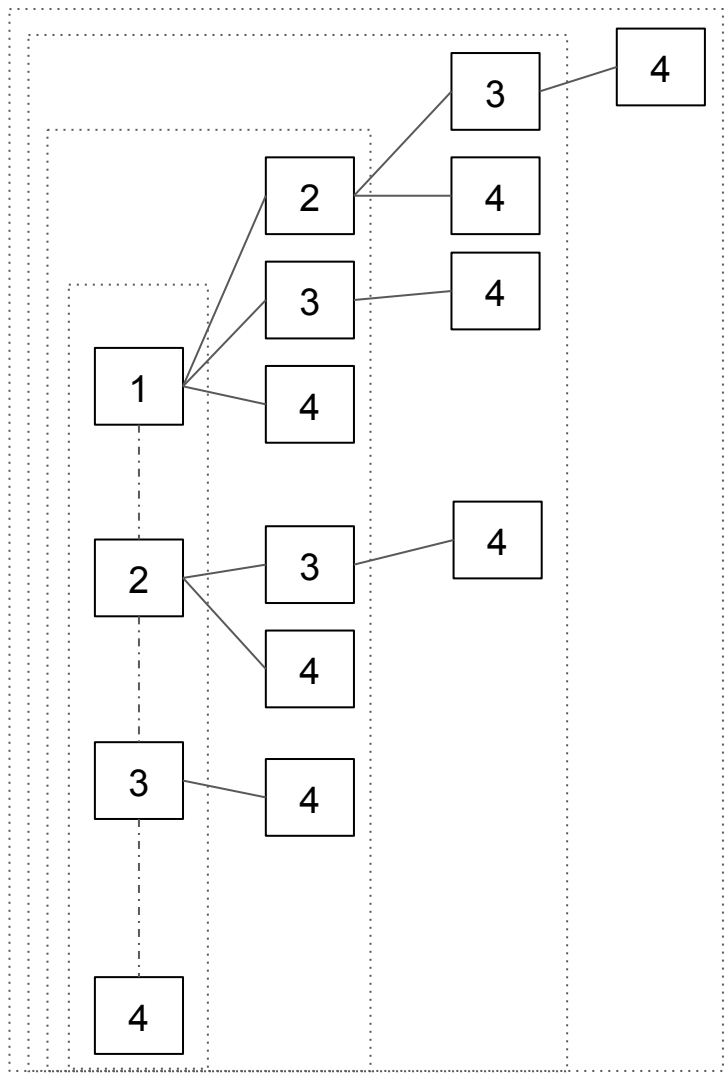
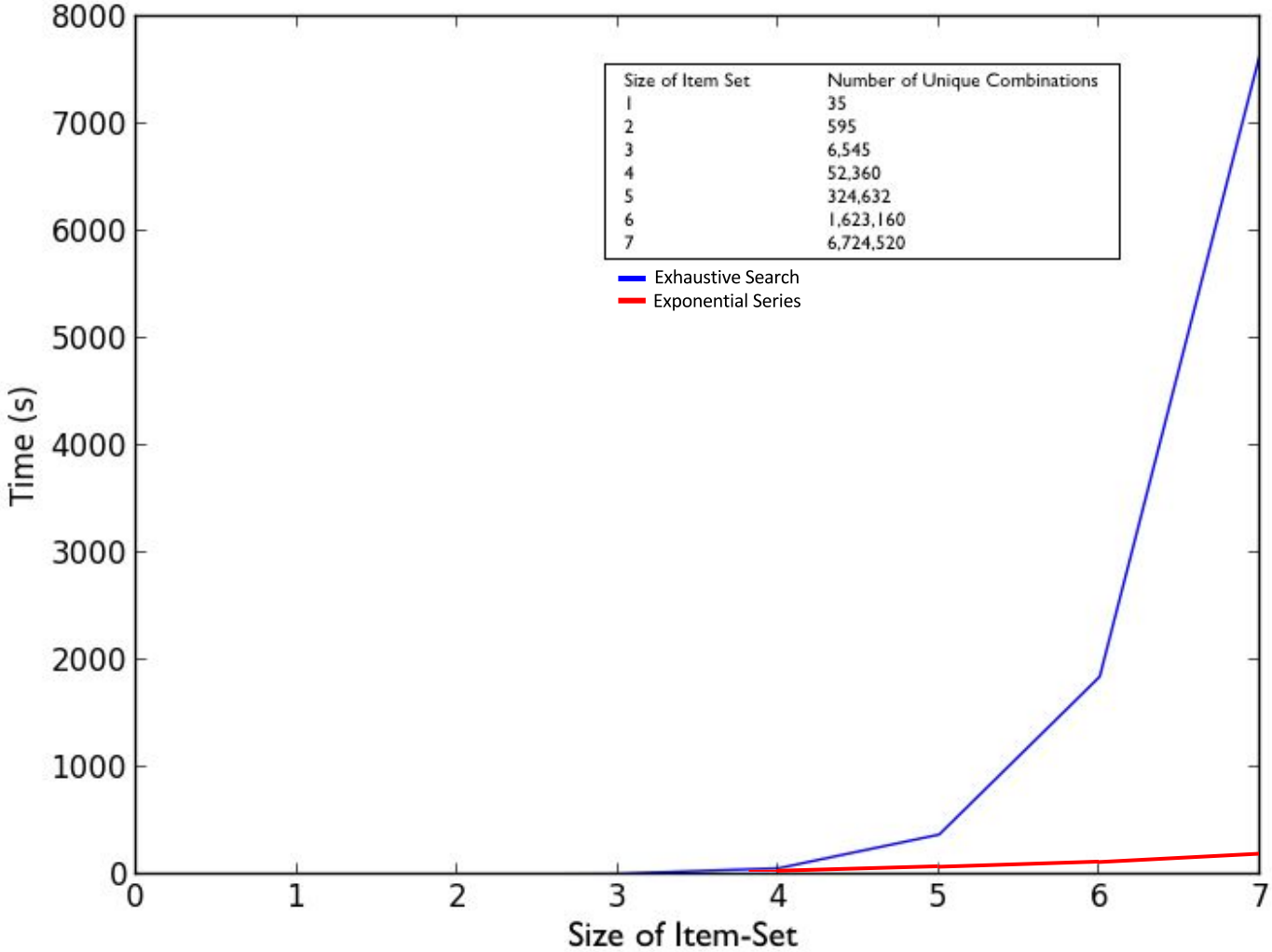


Exhaustive Search of set S {1,2,3,4} yielding k-itemsets

1-itemsets	2-itemsets	3-itemsets	4-itemsets
{1}	{1,2}	{1,2,3}	{1,2,3,4}
{2}	{1,3}	{1,2,4}	
{3}	{1,4}	{1,3,4}	
{4}	{2,3}	{2,3,4}	
	{2,4}		
	{3,4}		

Combinatorial explosion of k-itemset generation in an exhaustive search of set S {1, 2, 3, …, 35}

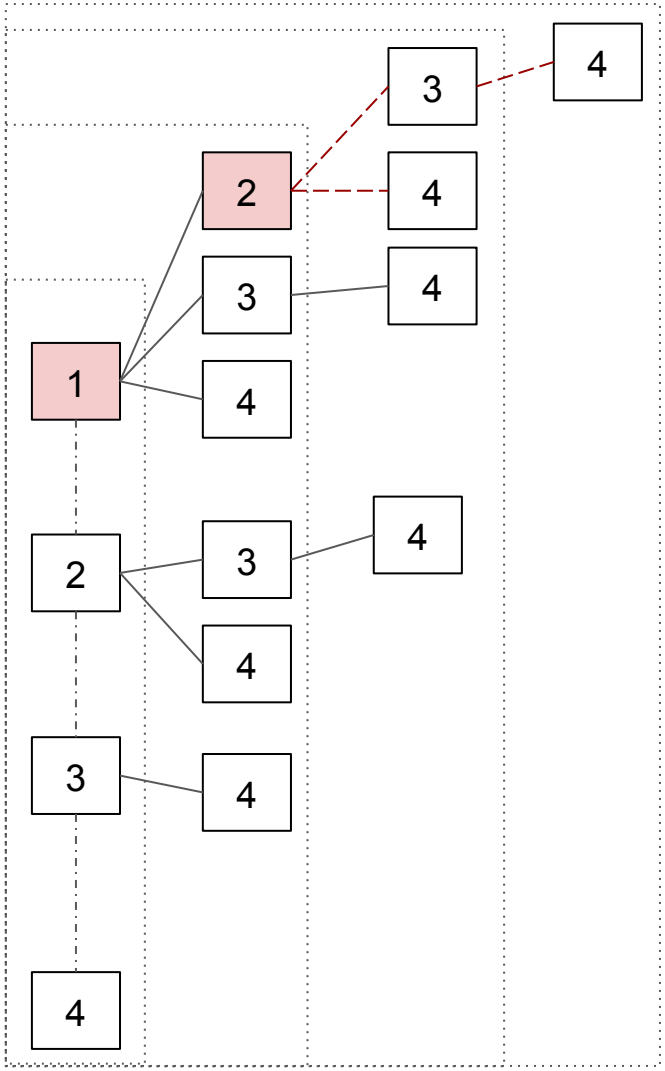


Observed

Itemset Cardinality	Number of Unique Combinations	Generative Timing (secs)
0	0	0.0
1	35	0.04
2	595	0.68
3	6,545	7.39
4	52,360	59.46
5	324,632	373.39
6	1,623,160	1845.85
7	6,724,520	7660.54

Extrapolated

Itemset Cardinality	Number of Unique Combinations	Generative Timing (secs)
8	23,535,820	26934.39
10	183,579,396	210088.26
12	834,451,800	954946.64
14	2,319,959,400	2654961.54
16	4,059,928,950	4646182.69
18	4,537,567,650	5192792.42
20	3,247,943,160	3716946.15
22	1,476,337,800	1689520.98
24	417,225,900	477473.32
26	70,607,460	80803.18
28	6,724,520	7695.54
30	324,632	371.51
35	1	0.0011444

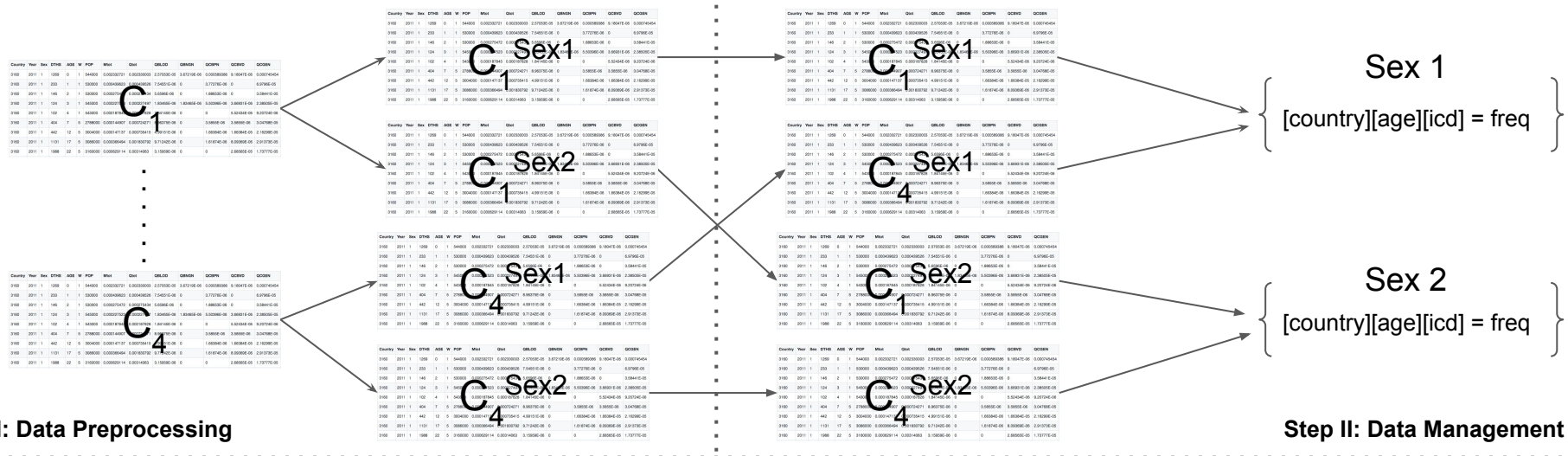


Exhaustive Search of set S {1,2,3,4} yielding k-itemsets

1-itemsets	2-itemsets	3-itemsets	4-itemsets
{1}	{1,2}	{1,2,3}	{1,2,3,4}
{2}	{1,3}	{1,2,4}	
{3}	{1,4}	{1,3,4}	
{4}	{2,3}	{2,3,4}	
	{2,4}		
	{3,4}		

Apriori Algorithm of set S {1,2,3,4} yielding k-itemsets

1-itemsets	2-itemsets	3-itemsets	4-itemsets
{1} ✓	{1,2} ✘	~~{1,2,3}~~	~~{1,2,3,4}~~
{2} ✓	{1,3} ✓	~~{1,2,4}~~	
{3} ✓	{1,4} ✓	{1,3,4} ✓	
{4} ✓	{2,3} ✓	{2,3,4} ✓	
	{2,4} ✓		
	{3,4} ✓		



Set S = {1,2,3,4}

Countries: C_1 C_2 C_3 C_4

{1} = chi_square([32, 40, 30, 20]) ✓

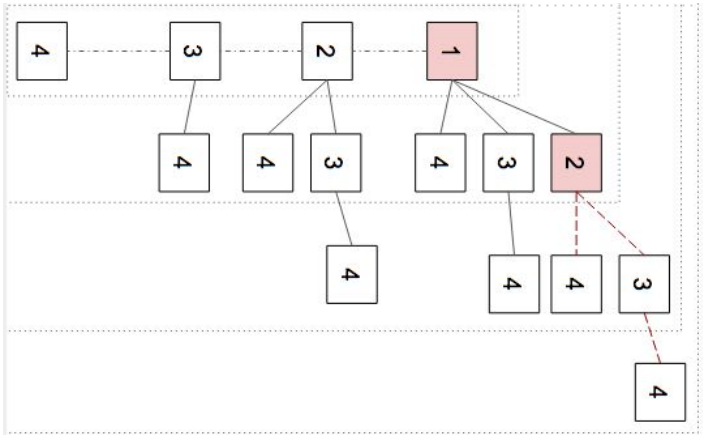
{2} = chi_square([8, 15, 5, 6]) ✓

$\{1,2\}_K$ [40, 55, 35, 26]+

C_1 C_2 C_3 C_4

{1,2} chi_square([40,55,35,26]) ✘

p-value < alpha
Does not get added to the Queue!



1-itemsets	2-itemsets	3-itemsets	4-itemsets
{1} ✓	{1,2} ✘ = [40,55,35,26]	~~{1,2,3}~~	~~{1,2,3,4}~~
{2} ✓	{1,3} ✓	~~{1,2,4}~~	
{3} ✓	{1,4} ✓	{1,3,4} ✓	
{4} ✓	{2,3} ✓	{2,3,4} ✓	
	{2,4} ✓		
	{3,4} ✓		

Step III: Data Analysis