

Technical Report

A global comparison of Complete Search FSM implementations in Centralized Graph Transaction Databases

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I. Introduction

We present in this report the experimental results of thirteen algorithms' implementations for frequent subgraph mining task in centralized graph transaction databases. Algorithms that are included perform a complete search theoretically. Detailed results are presented in this report according to three metrics of performance. Tests were performed for eleven datasets. No analysis is included in this report.

II. Experimental Settings

We define briefly in this section, the tested implementations of Complete Search FSM algorithms, the tested centralized graph transaction datasets, the possible strategy of the minimum support threshold used by implementations, the used machine resources, the metrics used to evaluate the efficiency of algorithms implementations and cases of unreported results. For more information about the experimental settings, please refer to our technical report.¹

1. Implementations

We experimented in this study thirteen implementations of six algorithms namely gSpan [1], Gaston [2], FFSM [3], FSG [4], DMTL [5] and MoFa/MoSS [6] (see Table 1). The selection of the implementations and algorithms among others in the literature, is justified in our technical report.¹

It is worth noting that for some datasets, some implementations results are not reported due to different reasons. The implementation gSpan (Keren Zhou, 2015) is able to process only small datasets. Results are reported only for the cases where it is able to run. The MOa and MOb implementations do not accept TXT format datasets. For this, we ran them only with SDF datasets (3 datasets). Except for these three implementations, the rest of the implementations results are reported for all datasets. Used abbreviations of the implementations are mentioned in Table 1.

Table 1 – Tested implementations of FSM algorithms (Complete Search)

Algorithm	Implementations	Abbreviation
FSG [4]	FSG Original v1.37 (PAFI v1.0.1) [7]	F
gSpan [1]	gSpan Original v.6 [8]	SO
	gSpan Original 64-bit v.6 [8]	SO64
	gSpan ParMol ²	SP
	gSpan (Zhou) ³ [11]	SK
MoFa/MoSS [6]	MoFa ParMol [9,10]	MFP
	MoSS ParMol [9, 10]	MSP
	MoFa/Moss Original (Miner v6.13) [12]	MOa
	With Kekule representation Option	
	Without Kekule representation	MOb
FFSM [3]	FFSM ParMol [9, 10]	FF
Gaston [2]	Gaston Original v1.1 [13]	GO
	Gaston Original RE v1.1 [13]	GR
	Gaston ParMol [9, 10]	GP
DMTL [5]	DMTL Original [14]	D

¹ see <https://liris.cnrs.fr/rihab.ayed/ESFSM.pdf> for more details

² ParMol framework could be provided by authors [9, 10]

³ No theoretical work is related to this software

2. Datasets

Experiments were conducted with eleven available datasets from the FSM literature. The input format of datasets is either SDF or TXT. By default, all implementations are tested with TXT format except for the MoFa Original implementation. SDF datasets were converted to TXT format using ParMol parsers.⁴ Table 2 displays the datasets we collected where: F is the original format of the dataset, S is the size on disk in KB, $|D|$ is the number of graphs in the dataset, $|T|$ is the average size of a graph by vertex (v)/edge(e) count and LT is the last date the dataset was experimented. The selection of these eleven datasets is justified in our report.⁵

For ParMol implementations, we modified the DS3 dataset by converting the labels of vertices that are strings or integers to integers only. We named this dataset DS3M.

Table 2 – Tested Centralized Graph Transaction Datasets of the Literature

Dataset	F	S	D	T	N	M	LT
PTE ⁶ [8, 13]	TXT	169.7	340	27 (v) / 27 (e)	66 (v) / 4 (e)	214 (v) / 214 (e)	[20]
HIV-CA [8]	TXT	285.2	422	40 (v) / 42 (e)	21 (v) / 4 (e)	189 (v) / 196 (e)	[21]
NCI145 [16]	TXT	9 900	19 553	30 (v) / 32 (e)	53 (v) / 3 (e)	110 (v) / 116 (e)	[22]
NCI330 [16]	TXT	9 700	23 050	25 (v) / 27 (e)	57 (v) / 3 (e)	120 (v) / 132 (e)	[22]
CAN2DA99 [17]	SDF	266 000 (SDF) / 14 500 (TXT)	32 553	26 (v) / 28 (e)	66(v) / 3 (e)	229 (v) / 236 (e)	[23]
AIDS [16]	TXT	26 200	56 213	28 (v) / 30 (e)	62 (v) / 4 (e)	222 (v) / 247 (e)	[22]
AID2DA99 [17]	SDF	111 000 (SDF) / 18 500 (TXT)	42 682	26 (v) / 28 (e)	62 (v) / 3 (e)	222 (v) / 247 (e)	[23]
NCI250 [17]	SDF	960 000 (SDF) / 89 600 (TXT)	250 251	21 (v) / 23 (e)	82 (v) / 3 (e)	252 (v) / 276 (e)	[2]
DS3 ⁷	TXT	101 700	273 324	22 (v) / 24 (e)	83 (v) / 3 (e)	99 (v) / 99 (e)	[18]
PS ⁸	TXT	2975	90	67 (v) / 256 (e)	21 (v) / 3 (e)	76 (v) / 320 (e)	[24]
DD [16]	TXT	13 100	1 178	284 (v) / 716 (e)	82 (v) / 1 (e)	5748 (v) / 14267 (e)	[22]

3. Minimum Support Threshold

The tested minimum support thresholds are within the interval of [1%, 90%]. The implementations use different internal frequency (integer). A same input minimum support threshold value can return different results according to the implementation. This is due to the difference in conversion of the minimum support threshold (float) to the internal frequency (integer) by performing: (i) *Truncation* (named as **L**), (ii) *Truncation+1* (**H**) or (iii) *Rounding* (**L/H**). We took these differences into consideration and compared implementations according to the same internal minimum frequency (i.e., L or H conversion strategy). GSpan Original v.6, gSpan Original v.6 64bit and gSpan (Keren Zhou, 2015) can be tested with only

⁴ ParMol implementations were provided by contacting authors [10]. However, an online code published by a third person is also available at : github.com/yangyi0318/MyParMol/tree/master/ParMol

⁵ see <https://liris.cnrs.fr/rihab.ayed/ESFSM.pdf> for more details

⁶ the packages of gSpan and Gaston contain the PTE dataset

⁷ DS3 is provided by authors [18]

⁸ PS is provided by authors [19]

(L) strategy (see Table 3). FSG Original uses the rounding strategy (L or H). For this, FSG Original results are reported with (L) strategy for some support values and with (H) strategy for some other values. MoFa Original, DMTL Original, Gaston Original versions and ParMol implementations could be optionally tested with both strategy (L or H). We choose for these last implementations one strategy (L or H) except for gSpan ParMol. GSpan ParMol is considered as a bridge between (L) and (H) strategies results, it is tested with both (L) and (H) strategy, which make it possible to have a global view of both strategies results.

Table 3 - Algorithms' strategy of Minimum Support/Frequency Input

Algorithm Implementation	Support Input (%)	Frequency Input(Integer)	Conversion of Support to Frequency
gSpan Original v.6 2009	X		Truncation (L)
gSpan-64bit Original v.6 2009	X		
gSpan (Keren Zhou, 2015)	X		
ParMol (Gaston, gSpan, MoFa, FFSM)	X	X	Truncation+1 (H)
MoFa Original v6.13	X	X	
Gaston Original v1.1		X	Truncation (L)
Gaston Original RE v1.1		X	
DMTL Original		X	-
FSG Original (PAFI v1.0.1)	X		Rounding (L/H)

4. Machine Characteristics

All experiments were performed on a machine with 4GB of RAM and a Quad Core processor. Linux OS is used for all FSM software.

Table 4 – Default Machine Characteristics

Processor	Intel Core Quad Core 2.40 GHz
RAM	4 GB
Hard Disk	192.8 GB
OS	<i>Default : Ubuntu (14.04) : All Software</i>

5. Evaluation Metrics

Three metrics are used to compare implementations: (i) execution time, (ii) memory consumption and (iii) the number of frequent subgraphs produced. Execution time results are reported in seconds and the memory consumption in KB.

6. Special Result Cases

Some results cases are colored in order to explain the absence of result value (see Table 5). Red colored result cells correspond to a termination failure of the implementation. We report the error type for each case of failure. Non-experimented values in our tests, are colored as green cells. Gray cells are used for FSG Original implementation only. FSG uses a rounding (L/H) minimum support strategy. For (L) strategy, FSG results of (H) strategy are gray cells and vice-versa.

Table 5 – Colored cells Results signification

Cell Color	Signification
Green	Non-experimented value

	Failure of termination
	Not testable with the used support strategy

III. Experimental Results

We present results of implementations by dataset. For each dataset, we present results according to each metric of evaluation. For each metric, we present results for (L) and (H) strategies of support are reported. The analysis of the reported results in this section is detailed in our technical report.⁹

1. HIV-CA dataset

Runtime

(H) strategy

Min Sup	SP (H)	GP (H)	GO (H)	GR (H)	F (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%	-	-	-	-	-	-	-		-
2%	-	-	-	-	-	-	-		-
3%	-	-	-	-	-	-			-
4%	-	-	233.448	-	-	-	101975		-
5%	1416.155	898.073	42.273	-		2172.51	15998.4	20698.797	-
6%	42.151	9.480	1.956	8.510		28.427	713.748	120.008	-
7%	24.581	5.298	1.164	5.188	51.2	15.726	397.675	62.352	-
8%	11.383	2.992	0.517	2.131	19.7	5.463	149.473	16.896	224.756
9%	9.559	2.314	0.381	1.532	14.4	4.169	107.448	13.484	175.66
10%	8.922	2.218	0.351	1.375		3.812	99.404	12.786	165.234
15%	3.491	1.519	0.125	0.419		1.718	27.603		
20%	1.520	0.982	0.060	0.163		1.061	8.091	1.965	3.495
25%	1.024	0.773	0.045	0.102	1.2	0.841	4.379		
30%	0.702	0.756	0.031	0.058	0.9	0.680	2.811	1.042	1.137
40%	0.739	0.545	0.024	0.045	0.8	0.641	2.038	0.783	0.963
45%	0.614	0.553	0.020	0.038	0.7	0.574	1.682		
50%	0.684	0.472	0.018	0.035	0.7	0.623	1.454	0.848	0.991
60%	0.581	0.441	0.016	0.022	0.6	0.531	1.360	0.738	0.775
70%									
80%	0.406	0.424	0.009	0.009	0.5	0.433	0.505	0.599	0.823
90%									

⁹ see <https://liris.cnrs.fr/rihab.ayed/ESFSM.pdf> for more details

(L) strategy

Min Sup	SP (L)	SO64 (128GB)	SO64	SO	SK (128GB)	SK	GO (L)	GR (L)	D (L)	F (L)
1%	-	-	-	-	-	-	-	-	-	-
2%	-	-	-	-	-	-	-	-	-	-
3%	-	-	-	-	-	-	-	-		-
4%	> 32400	-	-	9487.98	-	-	339.628	-	126233	-
5%	1432.358	1276.09	-	1323.257	1152.913	-	48.23	-	16283.3	1688.4
6%	168.252	280.662	-	259.29	194.457	-	8.120	-	2712.893	360.6
7%	25.314	48.669	-	38.671		20.136	1.215	5.360	412.03	
8%	13.244		21.512	17.489		7.891	0.568	2.280	169.472	
9%	9.482		11.856	11.910		5.366	0.389	1.564	108.348	
10%	8.531		10.825	10.809		5.085	0.352	1.383	99.583	13.2
15%	3.749		3.617	3.554		1.565	0.125	0.422	27.719	4.2
20%	1.668		1.151	1.261		0.684	0.061	0.164	8.149	1.7
25%	1.074		0.581	0.730		0.459	0.046	0.103	4.418	
30%	0.823		0.313	0.406		0.305	0.031	0.057	2.956	
40%	0.739		0.229	0.322		0.260	0.024	0.045	2.038	0.8
45%	0.614		0.183	0.279		0.234	0.020	0.038	1.682	0.7
50%	0.684		0.166	0.259		0.218	0.018	0.035	1.454	0.7
60%	0.581		0.154	0.227		0.208	0.016	0.022	1.360	0.6
70%										
80%	0.406		0.050	0.133			0.009	0.009	0.505	0.5
90%	0.670		0.055	0.133			0.014	0.013		0.5

Memory Consumption**(H) strategy**

Min Sup	SP (H)	GP (H)	GO (H)	GR (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%	-	-	-	-	-	-		-
2%	-	-	-	-	-	-		-
3%	-	-	1 GO disk space left	-	-			-
4%	>2316514	> 3002875 OutOfMemory	15496	-	-	293444		-

5%	2011426	1958293	12852	Segmentation fault	1509183	290116	1560627	-
6%	196751	183397.7	10272	4202	109505	281081.3	148973	-
7%	104940.7	100476.3	9294.667	3978.667	58128.67	270170.7	85421	> 3247102
8%	41253.67	37184.33	9313.333	3897.333	27086	269776	31779	1857832
9%	27530.33	27234	9213.333	3901.333	20764.67	269756	24766	1623716
10%	30114	19286	9170.667	3841.333	22713.67	251446.7	24531	1601738
15%	8981.333	11055	8333.333	3832	10942.33	186270.7		
20%	4675	2575	8042.667	3750	2633.333	169033.3	3435	19352
25%	1937	1847	8189.333	3754	2310	168426.7		
30%	2009.333	1888.333	7094.667	3804	2257	2830.334	1726	3644
40%	2127.667	1880.667	6493.333	3780	2492.667	153149.3	1869	3480
45%	1829	1734.667	6220	3762.667	2257	151546.7		
50%	1982	1777	6156	3740	2273.667	151517.3	2481	3430
60%	1830	1724	6012	3757.333	2321	151578.7	2455	3415
70%								
80%	1883	1730	4688	3628	2320	81588	2270	4188
90%								

(L) strategy

Min Sup	SP (L)	SK (128GB)	SK	GO (L)	GR (L)	D (L)
1%	-	-	-	-	-	-
2%	-	-	-	-	-	-
3%	-	-	-	-	-	
4%	-	Killed	-	15456	-	293472
5%	2044977	87737143	-	13644	-	290092
6%	561236	19464256	Killed	10581.33	Segmentation fault	289953.333
7%	109593.7		2247555	9284	3956	270033.333
8%	45098		683958.7	9317.333	3853.333	269757.333
9%	28506.33		375222.7	9078.667	3738.667	269693.3
10%	26460.67		339962.7	9045.333	3872	251517.333
15%	10127.67		94201.33	8397.333	3873.333	186218.666
20%	4478.333		28990.67	7828	3738.667	169056
25%	1900		24574.67	8150.667	3764	168462.666
30%	1879		20414.67	7137.333	3758.667	155577.333

40%	2127.667		20392	6493.333	3780	153149.333
45%	1829		20377.33	6220	3762.667	151546.666
50%	1982		20353.33	6156	3740	151517.333
60%	1830		20384	6012	3757.333	151578.666
80%	1883			4688	3628	81588
90%	2100			3920	3836	

Number of Frequent Subgraphs

(H) strategy

Min Sup	SP (H)	GP (H)	GO (H) GR (H)	F (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%	-	-	-	-	-	-		-
2%	-	-	-	-	-	-		-
3%	-	-	-	-	-			-
4%	-	-	5127411	-	-	5127411		-
5%	885873	885722	885864		885873	885864	885873	-
6%	111620	111579	111611		111620	111611	111620	-
7%	62100	62058	62092	62092	62100	62092	62100	-
8%	24410	24410	24402	24402	24410	24402	24410	885
9%	17362	17362	17355	17355	17362	17355	17362	742
10%	15839	15839	15832		15839	15832	15839	646
15%	4471	4471	4466		4471	4466		
20%	927	927	923		927	923	927	220
25%	246	246	242	242	246	242		
30%	123	123	119	119	123	119	123	83
40%	60	60	56	56	60	56	60	45
45%	39	39	35	35	39	35		
50%	32	32	29	29	32	29	32	28
60%	19	19	16	16	19	16	19	17
70%								
80%	7	7	4	4	7	4	7	6
90%								

(L) strategy

Min Sup	SP (L)	SO SO64	SK	GO (L) GR (L)	F (L)	D (L)
1%	-	-	-	-	-	-
2%	-	-	-	-	-	-
3%	-	-	-	-	-	-
4%	-	6825311	-	6825303	-	6825303
5%	905299	905298	723603	905290	905290	905290
6%	293406	293404	250518	293397	293397	293397
7%	65260	65259	60183	65252		65252
8%	28559	28558	26304	28551		28551
9%	17512	17511	15945	17505		17505
10%	15973	15972	14486	15966	15966	15966
15%	4476	4476	4152	4471	4471	4471
20%	937	936	915	932	932	932
25%	248	248	239	244		244
30%	124	124	120	120		120
40%	60	60	56	56	56	56
45%	39	39	35	35	35	35
50%	32	32	29	29	29	29
60%	19	19	16	16	16	16
70%						
80%	7	7		4	4	4
90%	3	3		1	1	

2. PTE datasetRuntime**(H) strategy**

Min Sup	SP (H)	GP (H)	GO (H)	GR (H)	F (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%			1542	-			-		-
1.47%		547.53	15.359	56.622			-		-
1.5%	163.63	93.929	6.630	24.018		181.864	7512.32		-
2%	64.848	12.904	2.283	9.954	128.833	54.490	2484.917	899.75	-

3%	12.365	2.467	0.363	1.601		7.363	311.951	89.299	-
4%	5.66	1.445	0.150	0.658	4.7	3.288	111.564	32.216	-
5%	3.677	1.434	0.095	0.383	2.8	2.058	55.312	14.302	-
6%	1.96	0.836	0.059	0.225		1.336	26.519	7.209	-
7%	1.779	0.738	0.050	0.179	1.5	1.152	19.296	4.481	277.406
8%	1.416	0.671	0.041	0.121		1.099	12.865	3.768	66.315
9%	1.273	0.624	0.034	0.111	1	0.82	9.419	2.169	19.067
10%	1.016	0.579	0.030	0.099	0.9	0.829	6.786	1.786	10.956
15%	0.821	0.479	0.024	0.060		0.625	2.744		
20%	0.698	0.466	0.015	0.042	0.5	0.538	1.755	1.309	1.794
25%	0.668	0.436	0.012	0.032	0.5	0.544	1.184		
30%	0.54	0.488	0.010	0.026	0.4	0.463	1.035	0.913	1.609
40%	0.524	0.453	0.009	0.023	0.4	0.382	0.778	0.799	1.216
50%	0.485	0.298	0.008	0.016	0.4	0.404	0.650	0.732	1.08
60%									
70%	0.394	0.387	0.004	0.004	0.3	0.317	-	0.458	0.299
80%									
90%	0.382	0.291	0.004	0.004	-	0.243	-	0.376	0.363

(L) strategy

Min Sup	SP (L)	SO64 (128 GB)	SO64	SO	SK (128GB)	SK	GO (L)	GR (L)	F (L)	D (L)
1%			-			-	5071	-		-
1.47%			-			-	1542.143	-		-
1.5%	451.21	684.522	-	772.417	823.377	-	15.359	56.622	977.3	-
2%	163.63	299.669	-	331.335	306.570	-	6.627	24.018		7512.32
3%	15.577		21.729	28.780		19.990	0.454	2.084	18.88	429.929
4%	7.116		8.564	11.444		7.687	0.193	0.840		150.757
5%	3.677		3.704	4.803		3.381	0.095	0.383	2.8	55.312
6%	2.409		2.292	2.908		1.873	0.068	0.246	1.9	31.535
7%	2.049		1.721	2.134		1.323	0.052	0.191		21.794
8%	1.729		1.241	1.498		0.895	0.042	0.143	1.2	13.501
9%	1.574		1.004	1.202		0.706	0.037	0.117		10.486
10%	1.016		0.804	0.948		0.534	0.030	0.099	0.9	6.786
15%	0.922		0.467	0.535		0.284	0.019	0.060	0.7	2.728

20%	0.698		0.285	0.342		0.195	0.015	0.042	0.5	1.755
25%	0.668		0.222	0.269		0.159	0.012	0.032	0.5	1.184
30%	0.54		0.175	0.220		0.143	0.010	0.026	0.4	1.035
40%	0.524		0.157	0.202		0.126	0.009	0.023	0.4	0.778
50%	0.485		0.103	0.162		0.105	0.008	0.016	0.4	0.650
60%										
70%	0.394		0.016	0.041		0.004	0.004	0.3	-	
80%										
90%	0.382		0.036	0.04		0.004	0.004	-	-	

Memory Consumption

(H) strategy

Min Sup	SP (H)	GP (H)	GO (H)	GR (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%			189884	Segmentation Fault				-
1.47%		1132652	64088	7244				-
1.5%	521709.7	529016.7	38768	5674	280854	3610816		-
2%	192198	199972	10421.33	5096	98397.33	704956	155188	-
3%	23047	25126.33	7062.667	4618	17907	226014.7	19799	-
4%	7918	12427.67	6354.667	4518	9726.667	184778.7	9254	-
5%	7411	6081	5946.667	4518.667	7601	140550.7	10789	-
6%	3056	3079.667	5598.667	4520	3224	140373.3	6836	> 3136511 OutOfMemory
7%	3524.667	2742	5088	4576	1700	101090.7	6468	1995452
8%	3211	2170	4945.333	4510	1944.667	100996	3806	990186
9%	2833	1941	4862.667	4610	1798	90689.33	2846	301369
10%	2061	1826	4749.333	4545.333	1643.667	76712	4767	204529
15%	1446	1560.333	4554.667	4508	1430	53360		
20%	1410.333	1396.333	4588	4516	1679.333	44690.67	1856	30996
25%	1338	1296	4302.667	4545.333	1629	42312		
30%	1390.333	1193	4336	4538.667	1689	42310.67	1246	17285
40%	1437	1331.333	4346.667	4513.333	1487	40342.67	1538	2102
50%	1084	1296.333	4110.667	4521.333	1794	40354.67	1507	2522
60%								
70%	1397	1089	3012	4500	1528	-	1184	2335

80%								
90%	1396	1854	3176	4500	1497	-	1396	1446

(L) strategy

Min Sup	SP (L)	SK (128GB)	SK	GO (L)	GR (L)	D (L)
1%			-	637560	-	-
1.47%			-	190105.3	Segmentation Fault	-
1.5%	1121883	48198928	-	55728	7221.333	Machine restarts
2%	521709.7	18406608	-	38786.67	5669.333	3610816
3%	28097		771966.7	7158.667	4688	229814.7
4%	11587		233353.3	6588	4518.667	196706.7
5%	7411		78942.67	6344.667	4518.667	140550.7
6%	3923.333		47285.33	5688	4558.667	140449.3
7%	2999		35988	5237.333	4516	115604
8%	2381.667		26662.67	5042.667	4552	101060
9%	2862.667		22228	4974.667	4554.667	90805.33
10%	2061			4749.333	4545.333	76712
15%	1451		13578.67	4677.333	4518.667	53410.67
20%	1410.333		11508	4588	4516	44690.67
25%	1338		11038.67	4302.667	4545.333	42312
30%	1390.333		10818.67	4336	4538.667	42310.67
40%	1437		10882.67	4346.667	4513.333	40342.67
50%	1084		10862.67	4110.667	4521.333	40354.67
60%						
70%	1397			3012	4500	-
80%						
90%	1396			3176	4500	-

Number of Frequent Subgraphs**(H) strategy**

Min Sup	SP (H)	GP (H)	GO (H) GR (H)	F (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%			12708378			-	-	-
1.47%		716889	721213			-	-	-
1.5%	344513	342938	344479		344513	344479	-	-

2%	136981	136513	136949	136949	136981	136949	136981	-
3%	18146	18121	18121		18146	18121	18146	-
4%	5955	5951	5935	5935	5955	5935	5955	-
5%	3627	3625	3608	3608	3627	3608	3627	-
6%	2138	2138	2121		2138	2121	2138	-
7%	1786	1786	1770	1770	1786	1770	1786	654
8%	1240	1240	1224		1240	1224	1240	528
9%	993	993	977	977	993	977	993	464
10%	860	860	844	844	860	844	860	390
15%	433	433	420		433	420		
20%	199	199	190	190	199	190	199	120
25%	126	126	117	117	126	117		
30%	75	75	68	68	75	68	75	48
40%	62	62	58	58	62	58	62	36
50%	37	37	34	34	37	34	37	26
60%								
70%	2	2	0	0	2	0	2	2
80%								
90%	1	1	0	0	1	0	1	1

(L) strategy

Min Sup	SP (L)	SO SO64	SK	GO (L) GR (L)	F (L)	D (L)
1%				48732156		-
1.47%				12708378		-
1.5%	721249	721196	698934	721213	721213	-
2%	344513	344464	338284	344479		344479
3%	22786	22785	22200	22758	22758	22758
4%	8776	8776	8706	8753		8753
5%	3627	3627	3607	3608	3608	3608
6%	2343	2343	2326	2326	2326	2326
7%	1861	1861	1845	1845		1845
8%	1339	1339	1323	1323	1323	1323
9%	1065	1065	1049	1049		1049
10%	860	860	844	844	844	844

15%	437	437	424	424	424	424
20%	199	199	190	190	190	190
25%	126	126	117	117	117	117
30%	75	75	68	68	68	68
40%	62	62	58	58	58	58
50%	37	37	34	34	34	34
60%						
70%	2	2		0	0	0
80%						
90%	1	1		0	0	0

3. AID2DA99 dataset

Runtime

(H) strategy

Min Sup	SP (H)	GP (H)	GO (H)	GR (H)	F (H)	FF (H)	MoB	MoA	MFP (H)	MSP (H)
1%										-
1.5%	1592.852									-
2%	831.332	331.044	46.339	176.471	650.9	898.153	287.55	112.263	4204.552	-
3%	451.793	191.021	28.157	89.939		428.184	131.006	55.021	1441.921	-
4%	300.845	140.859	21.104	60.720		277.240	66.918	41.466	856.786	-
5%	232.655	115.846	17.158	45.995		217.333	66.717	32.677	638.548	-
6%	193.318	102.01	14.483	37	207.3	184.176	40.3515	28.673	477.677	-
7%	158.486	90.23	12.551	30.780	180.7	182.344				-
8%	138.481	79.499	11.340	26.809	161.6	132.797	33.3375	21.346	335.455	-
9%	120.206	72.071	10.029	23.288		153.87	30.789	28.457	276.11	-
10%	107.732	63.121	8.891	20.225	131.633	124.722	29.97	26.042	234.577	-
15%	67.263	43.665	5.805	12.011	91.4	74.729				
20%	51.285	58.613	4.621	8.863	73.3	61.301	23.861	14.535	105.044	559.524
30%	31.579	34.096	3.028	5.180	48.8	38.194	17.8655	14.655	59.88	230.322
40%	22.68	24.937	2.225	3.565	35.2	29.014	15.4	12.669	45.82	157.291
50%	18.092	23.148	1.806	2.738	28.3	25.149	16.26	10.52	34.245	123.87
60%										
70%	10.614	11.512	1.097	1.364	17.3	16.716	17.239	9.556	19.173	70.92
80%										

90%	4.943	5.027	0.542	0.493	12.7	6.975	11.046	10.422	6.017	15.671
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(L) strategy

Min Sup	SP (L)	SO64	SO	GO (L)	GR (L)	F (L)	D (L)
1%		-	5859.16	133.013			-
1.5%	1523.042	-	2373.14	72.448	319.599	1012.5	-
2%	837.483	927.838	1168.903	45.355	174.577		-
3%	445.013	463.547	565.544	27.593	88.974	402.3	-
4%	312.19	311.418	373.696	20.461	60.189	301.2	-
5%	268.196	243.270	292.991	16.682	45.931	244.3	-
6%	205.439	197.580	237.249	14.222	37.075		-
7%	176.114	166.447	199.722	12.370	30.779		-
8%	150.004	145.871	173.970	11.084	26.718		-
9%	130.185	126.108	150.376	9.812	23.215	145.4	-
10%	107.732	112.053	132.962	8.891	20.225	131.633	-
15%	67.263	70.396	85.116	5.805	12.011	91.4	-
20%	51.285	54.570	66.865	4.621	8.863	73.3	-
30%	31.579	32.785	41.543	3.028	5.180	48.8	-
40%	22.798	23.779	30.497	2.225	3.565	35.2	1405.45
50%	18.092	17.994	25.373	1.806	2.738	28.3	1332.627
60%							
70%	10.614	10.619	16.917	1.097	1.364	17.3	1205.71
80%							
90%	4.843	3.249	8.248	0.542	0.493	12.7	24.270

Memory Consumption**(H) strategy**

Min Sup	SP (H)	GP (H)	GO (H)	GR (H)	FF (H)	MFP (H)	MSP (H)
1%							
1.5%	526315						-
2%	453539.7	1729857	554916	56300	965587.3	817099	-
3%	390642.7	1475909	493805.3	53792	752866.3	741664	-
4%	348636.7	1262774	431574.7	52844	718472.3	626822	-
5%	337941.3	1219576	411401.3	52536	705941.7	576714	-

6%	316697	1125796	382121.3	52314.67	709635	561729	-
7%	305881	1027088	356214.7	52000	685827		-
8%	300477.3	1002927	344589.3	52074.67	677559.7	507486	-
9%	294558.3	941624	326832	52052	763056	484523	-
10%	293143	897473.3	319508	52030.67	675654	462910	>3198975
15%	267262.3	768173.7	277522.7	51758.67	554391.3		
20%	263126.7	704932	243858.7	51766.67	576747.3	416194	1986887
30%	231755	652112.3	205453.3	51788	511262	402838	1459672
40%	235996	632883.3	191693.3	51756	457642.3	470914	1040161
50%	231262.3	610912.3	183244	51813.33	459553	437067	900578
60%							
70%	203668	420894	161488	51420	370072	366528	679541
80%							
90%	136332	278359	96952	51424	181221	230720	384516

(L) strategy

Min Sup	SP (L)	GO (L)	GR (L)	D (L)
1%		623788		-
1.5%	529050	595444	60700	-
2%	453473	554526.7	56281.33	-
3%	389073.3	494266.7	53622.67	-
4%	349378.7	433610.7	52816	-
5%	334109.3	412837.3	52576	-
6%	317648	383437.3	52382.67	-
7%	308765	353428	52056	-
8%	303605.3	345656	52060	-
9%	294670.5	328544	52076	-
10%	293143	319508	52030.67	-
15%	267262.3	277522.7	51758.67	-
20%	263126.7	243858.7	51766.67	-
30%	231755	205453.3	51788	Killed
40%	235996	191693.3	51756	3607696
50%	231262.3	183244	51813.33	3604469
60%				
70%	203668	161488	51420	3559464

80%				
90%	136332	96952	51424	2815684

Number of Frequent Subgraphs**(H) strategy**

Min Sup	SP (H)	GP (H)	F (H)	FF (H)	MFP (H)	MSP (H)	MOa	MOb
1%						-		
1.5%	44983					-		
2%	25205	25206	25197	25205	25205	-	9741	25 205
3%	11531	11531		11531	11531	-	4395	11531
4%	6670	6670		6670	6670	-	2566	6670
5%	4442	4442		4442	4442	-	1763	4442
6%	3162	3162	3157	3162	3162	-	1224	3162
7%	2362	2362	2357	2362		-		
8%	1869	1869	1864	1869	1869	-	695	1869
9%	1484	1484		1484	1484	-	590	1484
10%	1185	1185	1180	1185	1185	-	484	1185
15%	511	511	506	511				
20%	326	326	322	326	326	326	146	326
30%	133	133	129	133	133	133	75	133
40%	71	71	68	71	71	71	37	71
50%	45	45	42	45	45	45	33	45
60%								
70%	19	19	16	19	19	19	11	19
80%								
90%	3	3	2	3	3	3	2	3

(L) strategy

Min Sup	SP (L)	SO SO64	GO (L) GR (L)	F (L)	D (L)
1%		107700	107693		-
1.5%	45143	45143	45135	45135	-
2%	25246	25246	25238		-
3%	11550	11550	11542	11542	-

4%	6675	6675	6668	6668	-
5%	4447	4447	4441	4441	-
6%	3163	3163	3158		-
7%	2363	2363	2358		-
8%	1871	1871	1866		-
9%	1487	1487	1482	1482	-
10%	1185	1185	1180	1180	-
15%	511	510	506	506	-
20%	326	326	322	322	-
30%	133	133	129	129	-
40%	71	71	68	68	68
50%	45	45	42	42	42
60%					
70%	19	19	16	16	16
80%					
90%	3	3	2	2	2

4. CAN2DA99 dataset

Runtime

(H) strategy

Min Sup	SP (H)	GP (H)	GO (H)	GR (H)	F (H)	FF (H)	D (H)	MFP (H)	MSP (H)	MOa	MOb
1%							-		-		
1.5%							-		-		
2%	1255.289	428.286	61.207	254.749		1421.383	-	7719.054	-	163.986	295.563
3%	553.559	209.394	31.395	110.302	458.033	574.274	-	2275.978	-	76.413	110.243
4%	324.178	139.228	21.397	67.068		411.593	-		-	50.989	374.946
5%	243.084	107.161	16.893	48.253	241.633	267.325	-	656.202	-	48.458	139.56
6%	188.784	91.363	13.581	36.954		198.639	-		-	32.935	222.444
7%	154.309	78.711	11.660	30.328	169.6	163.896	-	402.023	-	29.518	200.984
8%	134.359	68.449	10.043	25.332	149.4	143.967	-				
9%	115.959	59.85	9.073	22.101	133.966	124.816	-	225.019	-	26.703	38.289
10%	101.301	56.972	8.062	18.983	120.166	106.925	-	225.019	-	26.286	30.651
15%	60.259	50.736	5.152	10.929	82.1	63.584					

20%	44.484	34.385	3.952	7.681	63.766	47.199	2127.49	89.767	351.311	20.218	37.594
30%	27.876	19.943	2.728	4.621	42.7	32.585	2043.93	53.676	204.362	19.552	30.152
40%	19.554	15.528	1.984	3.212	31.6	24.238	1324.45	38.819	150.496	15.113	25.981
50%	14.917	13.661	1.651	2.394	23.1	18.929	1252.62	30.14	117.715	18.55	16.948
60%	13	10.805	1.316	1.875	20	15.352	1178.88	26.843	96.628	14.537	17.148
70%											
80%	5.44	6.836	0.572	0.580	10.5	9.002	32.329	9.682	29.242	24.594	13.83
90%											

(L) strategy

Min Sup	SP (L)	SO64 (128GB)	SO64	SO	GO (L)	GR (L)	F (L)
1%			-	10210.1	192.107		
1.5%			-				1672.8
2%	1331.643	1736.3	-	2168.654	61.041	253.618	933.3
3%	583.032		626.056	813.127	31.053	110.279	
4%	356.482		368.788	468.072	21.303	67.240	312.633
5%	255.501		261.345	327.265	16.352	48.150	
6%	209.209		202.998	251.577	13.420	36.560	198.966
7%	166.159		165.668	204.245	11.391	30.027	
8%	134.359		141.699	173.383	10.043	25.332	149.4
9%	121.307		123.247	150.939	8.957	21.820	
10%	101.301		108.256	132.042	8.062	18.983	120.166
15%	60.259		64.938	79.775	5.152	10.929	82.1
20%	44.484		47.998	59.424	3.952	7.681	63.766
30%	27.876		29.750	38.123	2.728	4.621	42.7
40%	19.774		20.470	27.282	1.984	3.212	31.6
50%	14.917		15.730	21.758	1.651	2.394	23.1
60%	13.064		12.724	18.397	1.316	1.875	20
70%			4.323	8.462	0.572	0.580	10.5
80%	5.922						
90%							

Memory Consumption**(H) strategy**

Min Sup	SP (H)	GP (H)	GO (H)	GR (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%						-		-
1.5%						-		-
2%	421694.3	1718203	539064	48986	1011571	-	746725	-
3%	330577.3	1477738	486274.7	44230	782824	-	690892	-
4%	292724.7	1349363	435942.7	42952	661838.3	-		-
5%	278400.7	1153768	390006.7	42412	584874.7	-	551920	-
6%	256143.3	1089296	362004	42116	508251	-		-
7%	249207	951694	334989.3	41842	502246	-	499829	-
8%	239199.7	886757.7	307892	41925.33	569461.3	-		-
9%	235449	843657	298937.3	41848	470554.7	-	442346	-
10%	229402.3	871607.7	288418.7	41868	411308.7	Killed	442346	>3026888 OutOfMemory
15%	211927.3	705399	243146.7	41644	400806.7			
20%	203994	583236	205989.3	41589.33	388999	3597712	357461	1724884
30%	193577	533784	172052	41564	324452	3593072	334770	1103269
40%	187208	489006	152472	41500	324452	3620720	366373	907702
50%	183846	480475	151636	41588	389328	3571524	334677	852922
60%	180787	442529	145212	41496	329324	3601164	333609	709120
70%								
80%	145315	305692	101376	41232	230117	3173356	246877	404342
90%								

(L) strategy

Min Sup	SP (L)	GO (L)	GR (L)
1%		586292	
1.5%			
2%	418154.7	539925.3	48968
3%	334908.7	484988	44218.67
4%	297923	435170.7	42889.33

5%	274112	392730.7	42433.33
6%	259281	361696	42118.67
7%	250759.7	334894.7	41838.67
8%	239199.7	307892	41925.33
9%	239967	298136	41868
10%	229402.3	288418.7	41868
15%	211927.3	243146.7	41644
20%	203994	205989.3	41589.33
30%	193577	172052	41564
40%	188632	152472	41500
50%	183846	151636	41588
60%	180787	145212	41496
70%			
80%	141774	101376	41232
90%			

Number of Frequent Subgraphs

(H) strategy

Min Sup	SP (H)	GP (H)	GO (H) GR (H)	F (H)	FF (H)	D (H)	MFP (H)	MSP (H)	MOa	MOb
1%						-		-		
1.5%						-		-		
2%	36684	36686	36676		36684	-	36684	-	15954	36684
3%	15553	15554	15545	15545	15553	-	15553	-	6074	15553
4%	8699	8699	8693		8699	-	8699	-	3355	8699
5%	5663	5663	5657	5657	5663	-	5663	-	2175	5663
6%	3916	3916	3911		3916	-	3916	-	1564	3916
7%	2895	2895	2890	2890	2895	-	2895	-	1122	2895
8%	2278	2278	2273	2273		-		-		
9%	1822	1822	1817	1817	1822	-	1452	-	687	1822
10%	1452	1452	1447	1447	1452	-	1452	-	578	1452
15%	606	606	601	601	606					
20%	366	366	362	362	366	362	366	366	186	366
30%	161	161	158	158	161	158	161	161	81	161
40%	87	87	84	84	87	84	87	87	41	87

50%	51	51	48	48	51	48	51	51	34	51
60%	38	38	35	35	38	35	38	38	29	38
70%										
80%	9	9	6	6	9	6	9	9	5	9
90%										

(L) strategy

Min Sup	SP (L)	SO SO64	GO (L) GR (L)	F (L)
1%		176295	176292	
1.5%				68630
2%	36811	36811	36803	36803
3%	15591	15591	15583	
4%	8710	8710	8704	8704
5%	5670	5670	5664	
6%	3922	3922	3917	3917
7%	2896	2896	2891	
8%	2278	2278	2273	2273
9%	1825	1825	1820	
10%	1452	1452	1447	1447
15%	606	605	601	601
20%	366	366	362	362
30%	161	161	158	158
40%	87	87	84	84
50%	51	51	48	48
60%	38	38	35	35
70%				
80%	9	9	6	6
90%				

5. AIDS datasetRuntime**(H) strategy**

Min Sup	SP (H)	F (H)	FF (H)	D(H)	MFP (H)	MSP(H)
1%				-		-
1.5 %				-		-
2%	1765.594		3003.615	-	28081.826	-
3%	399.159			-		-
4%	220.867	208.3	438.562	-	1019.181	-
5%	165.553	168.2	287.687	-	717.431	-
6%	128.795	143.5	233.546	-	494.171	-
7%	109.898	126.3	193.127	-	336.765	-
8%	90.39	115.5	161.41	-	263.948	-
9%	79.245	105.3	136.818	-	242.262	-
10%	69.426	98.3	114.02	-	210.735	2849.297
20%	35.814	58.3	89.048	-	101.17	418.739
30%	22.275	37.433	49.337	-	55.222	209.843
40%	17.828	30.9	40.014	-	50.105	155.155
50%	16.617	27.9	31.565	-	47.906	151.114
60%	14.207	25.2	30.415	-	33.091	102.291
70%	11.78	21.5	17.348	-	24.603	84.005
80%	8.66	17.8	8.512	3264.14	14.906	38.416
90%	6.234	16.1	6.118	24.288	7.923	14.906

(L) strategy

Min Sup	SP (L)	SO64	SO	GO (L)	GR (L)	F (L)	GP (L)
1%		-	47108	633.569			
1.5 %	5261.231	-	9897.67	206.376	1035.52	2021.3	
2%	1701.661	2414.3	3422.39	92.116	401.246	738.5	1496.69
3%	406.035	505.909	683.461	31.225	96.348	294.2	289.75
4%	221.433	267.815	350.867	20.48	52.811		175.485
5%	161.272	193.436	251.665	15.971	38.708		135.976
6%	129.333	151.01	197.206	13.097	30.068	143.5	108.395
7%	102.334	122.761	159.036	10.973	24.376		103.43
8%	90.39	105.947	137.087	9.844	20.065	115.5	83.547
9%	79.245	93.630	120.237	8.731	17.489	105.3	78.627
10%	68.352	84.829	108.421	8.238	15.788	98.3	78.116
20%	35.814	41.825	56.209	4.522	8.127	58.3	50.229
30%	22.275	23.415	33.172	2.605	4.396	37.433	21.026

40%	17.828	18.926	28.216	2.055	3.537	30.9	15.033
50%	16.617	17.299	26.363	1.929	3.358	27.9	15.246
60%	14.207	14.293	22.983	1.567	2.090	25.2	12.111
70%	11.78	12.074	20.558	1.212	1.410	21.5	11.221
80%	8.831	5.669	13.101	0.889	0.788	17.8	8.004
90%	5.834	3.752	10.339	0.638	0.555	16.1	4.572

Memory Consumption**(H) strategy**

Min Sup	SP (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%			-		-
1.5 %			-		-
2%	411928	1409578	-	1396279	-
3%	344208		-		-
4%	327337	1392429	-	894841	-
5%	315307	1213859	-	840300	-
6%	303563	1201132	-	767975	-
7%	306982	1272300	-	814358	-
8%	297305	1284752	-	747206	-
9%	296480	1164711	-	733463	> 3148799 OutOfMemory
10%	292802.33	1165577	-	720995	2977521
20%	274164.67	947192	-	740933	1769171
30%	264262.33	770209	-	556702	1188681
40%	258556.33	788033	-	568369	1020560
50%	265540	712860	-	621942	954471
60%	249046.33	687425	-	673732	856150
70%	226819	527397	Machine restarts	640918	850657
80%	223265.33	371252	3566932	501168	619024
90%	190605	331952	2832952	373323	456008

(L) strategy

Min Sup	SP (L)	GP (L)	GO (L)	GR (L)
1%			1038944	
1.5 %	562223		992124	82160

2%	411232	2886620	928476	75364
3%	340712	2242446	756476	72680
4%	318270	1775061	611996	72156
5%	312587	1595517	560128	72180
6%	303563	1562896	534624	71868
7%	301317	1553924	518844	71936
8%	297305	1482032	502584	71888
9%	296480	1418954	489240	71940
10%	292802.33	1411855	488916	71872
20%	274164.67	1238164	432576	71668
30%	264262.33	974045	348016	71676
40%	258556.33	866278	333816	71604
50%	265540	794084	333176	71584
60%	249046.33	701353	312332	71580
70%	226819	794084	295800	71628
80%	223265.33	365870	171476	71416
90%	188125.33	136124	105872	71328

Number of Frequent Subgraphs**(H) strategy**

Min Sup	SP (H)	F (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%				-		-
1.5 %				-		-
2%	17675		17675	-	17675	-
3%	5824			-		-
4%	3045	3038	3045	-	3045	-
5%	1870	1864	1870	-	1870	-
6%	1259	1254	1259	-	1259	-
7%	906	901	906	-	906	-
8%	724	719	724	-	724	-
9%	598	593	598	-	598	-
10%	515	510	515	-	515	515
20%	142	138	142	-	142	142

30%	56	52	56	-	56	56
40%	33	30	33	-	33	33
50%	28	25	28	-	28	28
60%	18	15	18	-	18	18
70%	11	8	11	-	11	11
80%	6	3	6	3	6	6
90%	3	1	3	1	3	3

(L) strategy

Min Sup	SP (L)	SO SO64	GO (L) GR (L)	F (L)	GP (L)
1%		335491	335483		
1.5 %	48331	48329	48321	48322	
2%	17704	17703	17694	17695	17689
3%	5845	5845	5837	5837	5845
4%	3050	3050	3043		3050
5%	1871	1871	1865		1871
6%	1259	1259	1254	1254	1259
7%	908	908	903		908
8%	724	724	719	719	724
9%	598	598	593	593	598
10%	515	515	510	510	515
20%	142	142	138	138	142
30%	56	56	52	52	56
40%	33	33	30	30	33
50%	28	28	25	25	28
60%	18	18	15	15	18
70%	11	11	8	8	11
80%	6	6	3	3	6
90%	3	3	1	1	3

6. NCI330 datasetRuntime**(H) strategy**

Min Sup	SP (H)	F (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%	-		-			-
2%	-		-	775.24		-
3%	-		-	441.054		-
3.5%				372.874	> 46800	-
4%	1073.858	1159.6	670.319	339.823	1635.255	-
5%	297.735	366.9	254.567	277.622	523.262	-
6%	190.623	235.6	185.62	247.254	335.613	-
7%	136.354	173.2	140.254	220.152	233.105	-
8%	108.759	136.5	121.084	204.449	216.09	-
9%	86.814	113	103.495	185.595	196.524	-
10%	73.133	95.633	89.884	175.707	175.507	-
20%	26.753	38.733	33.408	113.141	56.294	221.736
30%	15.459	23.1	18.701	76.801	29.547	95.62
40%	9.519	16.2	11.529	62.320	20.704	57.744
50%	8.127	13.4	8.545	55.690	15.57	47.26
60%	5.971	9.2	6.819	42.911	10.184	28.486
70%	3.945	7.4	4.298	30.097	5.924	17.002
80%	3.22	6.3	3.573	22.180	4.696	10.796
90%	2.229	5.5	2.248	9.416	3.294	6.025

(L) strategy

Min Sup	SP (L)	SO64	SO	F(L)	GO (L)	GR (L)	GP (L)
1 %	-	-	-		32560.1	-	-
2%	-	-	> 6 days			-	-
3%	-	-			23022.6		-
3.5%	-	-	15301.3		276.295	1447.24	
4%	1073.858	-	781.479	1159.6	29.669	92.009	196.231
5%	305.066	243.403	288.454		16.286	40.347	93.181
6%	190.723	168.015	197.32	235.6	11.636	29.460	67.831
7%	136.354	127.214	151.837		9.308	21.211	53.27
8%	108.759	103.207	122.192	136.5	7.731	17.693	46.734
9%	86.71	87.964	103.808		6.603	14.835	39.09
10%	73.133	76.468	91.3422	95.633	6.043	12.439	37.979

20%	26.753	30.261	36.527	38.733	2.572	4.704	13.657
30%	15.459	16.887	21.576	23.1	1.578	2.567	9.653
40%	9.519	10.985	14.777	16.2	1.139	1.693	10.275
50%	8.127	9.175	12.867	13.4	0.952	1.369	9.47
60%	5.971	6.305	9.503	9.2	0.728	0.877	8.78
70%	3.945	3.538	6.254	7.4	0.439	0.454	3.817
80%	3.22	2.525	5.018	6.3	0.404	0.390	3.644
90%	2.329	1.343	3.843	5.5	0.287	0.217	2.201

Memory Consumption**(H) strategy**

Min Sup	SP (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%	-	-			-
2%	-	-	3381064		-
3%	-	> 3130366 <i>OutOfMemory</i>	3353216		-
3.5%			3266916	>3099842	-
4%	423786	547162	3264760	403043	-
5%	223979	438862	3255864	264618	-
6%	192936	422529	3255868	248675	-
7%	179047	379537	3170888	231684	-
8%	167398	398186	3163248	239657	-
9%	154125	390470	3154856	258235	-
10%	157886	352878	3154776	244684	> 3233791 <i>OutOfMemory</i>
20%	125796	300013	2938244	211586	1230114
30%	119946.33	255165	2938228	194101	756008
40%	120833.33	224535	2914744	185062	518878
50%	114801	195430	2914628	236428	439724
60%	123225.67	221959	2914764	201124	279747
70%	85603	142655	2460628	160663	254017
80%	90812.667	128625	1994676	144001	189345
90%	51964	70637	1337220	161831	245000

(L) strategy

Min Sup	SP (L)	GO (L)	GR (L)	GP (L)
1 %	-	238512	-	-
2 %	-		<i>Segmentation Fault</i>	-

3%	-	222136		>3030000
3.5%	> 3200000	217956	46072	
4%	423786	211700	31620	676437
5%	220937	205140	29188	613304
6%	192936	193720	28812	550725
7%	173725	187816	28560	541997
8%	167398	182628	28560	493747
9%	165879	177336	28192	489825
10%	157886	174096	28132	470475
20%	124031	131812	27960	361797
30%	120933	113364	27932	345979
40%	120833.33	101856	27956	323341
50%	114801	98332	27920	303767
60%	123225.67	90316	27944	277289
70%	85603	76076	28024	183519
80%	90812.667	73616	28040	178041
90%	51964	45180	27964	59646

Number of Frequent Subgraphs

(H) strategy

Min Sup	SP (H)	F (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1 %	-		-			-
2 %	-		-	14164		-
3%	-		-	5010		-
3.5%				3562		-
4%	51804	51798	51804	2717	51804	-
5%	11323	11318	11323	1747	11323	-
6%	6120	6115	6120	1301	6120	-
7%	3848	3843	3848	1023	3848	-
8%	2678	2673	2678	821	2678	-
9%	1972	1967	1972	662	1972	-
10%	1531	1526	1531	568	1531	-
20%	338	333	338	194	338	338
30%	126	123	126	79	126	126
40%	61	58	61	46	61	61
50%	43	40	43	36	43	43

60%	25	22	25	21	25	25
70%	12	9	12	9	12	12
80%	8	5	8	5	8	8
90%	2	1	2	1	2	2

(L) strategy

Min Sup	SP (L)	SO	SO64	F (L)	GO (L)	GR (L)	GP (L)
1 %	-	-	-		268761360	-	-
2%	-	-	-			-	-
3%	-		-		172490625	-	-
3.5%	-	1604845	-		1604837		-
4%	51804	52946	-	51798	51798	51798	51888
5%	11363	11363	11363		11358	11358	11373
6%	6120	6135	6120	6115	6115	6115	6121
7%	3861	3861	3861		3856	3856	3862
8%	2678	2682	2678	2673	2673	2673	2678
9%	1975	1975	1975		1970	1970	1975
10%	1531	1531	1531	1526	1526	1526	1531
20%	338	338	338	333	333	333	338
30%	126	126	126	123	123	123	126
40%	61	61	61	58	58	58	61
50%	43	43	43	40	40	40	43
60%	25	25	25	22	22	22	25
70%	12	12	12	9	9	9	12
80%	8	8	8	5	5	5	8
90%	2	2	2	1	1	1	2

7. NCI145 datasetRuntime**(H) strategy**

Min Sup	SP (H)	F (H)	D (H)	GO (H)	MFP (H)	MSP (H)
1%						-
2%			643.333	193.236	33795.55	-
3%	2991.679	2437.1	317.143	83.469	7804.097	-
4%	1292.356		258.402	47.867	3797.872	-

5%	630.247	581.5	219.927	29.280	1786.32	-
6%	391.173		201.075	20.099	994.431	-
7%	274.272	296.7	183.797	15.540	623.281	-
8%	210.107		172.721	12.604	472.314	-
9%	170.724	201.8	166.177	10.67	362.005	-
10%	141.43		158.649	9.337	293.453	-
20%	47.256	68.433	113.692	3.757	92.54	1169.528
30%	27.681	43.533	91.356	2.348	53.114	222.744
40%	17.032		81.679	1.599	32.131	111.538
50%	12.438	19.7	65.593	1.200	24.639	98.113
60%	9.968	15.233	47.494	0.991	18.683	64.432
70%	6.582	11.1	31.206	0.732	13.742	43.511
80%	5.6	8.2	30.446	0.603	9.039	31.067
90%	2.96	6.833	21.005	0.359	5.179	12.718

(L) strategy

Min Sup	SP (L)	SO64	SO	F (L)	GO (L)	GR (L)	FF (L)	GP (L)
1 %		-			12928.8			
1.5		-			590.258	3014.19		
2%	14322.215	-	14152.8	9058.9	193.387	876.447	11964.893	1915.678
3%	3190.921	-	4749.21		86.430	342.832	2488.2	629.616
4%	1290.169	-	2106.83	1081.1	49.559	176.675	1034.958	368.029
5%	626.776	752.097	1003.35		29.997	95.537	595.428	241.786
6%	396.833	445.483	564.556	388.8	20.124	59.275	350.267	149.15
7%	273.145	301.531	383.618		15.317	41.891	249.221	113.921
8%	211.089	231.544	289.931	238.3	12.708	32.857	190.21	86.066
9%	170.367	183.728	229.168		10.784	26.646	159.062	75.873
10%	152.556	154.761	191.204	171.766	9.694	22.746	149.672	64.727
20%	47.256	50.239	61.550	68.433	3.757	7.943	50.06	27.908
30%	27.681	29.491	36.836	43.533	2.348	4.339	30.03	20.067
40%	18.675	17.892	23.538	26.933	1.611	2.770	18.18	9.672
50%	12.438	12.925	17.689	19.7	1.200	1.985	13.025	11.788
60%	9.998	10.031	14.408	15.233	0.991	1.591	10.888	9.374
70%	6.582	7.253	11.031	11.1	0.732	1.096	7.79	5.741
80%	5.6	4.773	8.006	8.2	0.603	0.722	6.243	4.259

90%	2.96	2.060	4.760	6.833	0.359	0.340	3.53	2.498
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Memory Consumption

(H) strategy

Min Sup	SP (H)	D (H)	GO (H)	MFP (H)	MSP (H)
1 %					-
2%		3505320	459332	1581164	-
3%	520929	3465128	443708	578433	-
4%	341253	3291248	426824	526263	-
5%	274638	3230728	409812	519823	-
6%	230987	3223960	379544	480022	-
7%	210205	3218732	344060	424570	-
8%	192447	3218840	320984	417602	-
9%	184728	3215152	298452	428571	-
10%	176565.33	3215192	276520	378176	> 3296690 OutOfMemory
20%	143163.33	3182556	184572	253675	2277622
30%	131636.67	3182488	145000	225464	1318691
40%	130448.33	3182508	124760	201196	838885
50%	118391.33	3158768	108104	215689	750715
60%	125865.67	3158800	110648	229934	507986
70%	108269.33	2983340	96788	216467	415929
80%	103530	2983264	87028	194327	362835
90%	80432.333	2045868	74164	205532	284753

(L) strategy

Min Sup	SP (L)	GO (L)	GR (L)	GP (L)	FF (L)
1 %		470056			
1.5 %		462568	166444		
2%	1781775	456840	79672	2037218	1993300
3%	526126	450072	42748	1424409	1003070
4%	342270	426448	33800	1343635	806898
5%	277685	407516	30676	1294728	662342
6%	230987	377100	29544	1185270	593729
7%	210183	345836	28796	1024364	489306
8%	198557	320288	28488	973409	436424
9%	189765	298900	28244	900710	414349
10%	178485	277768	28184	807933	362120
20%	143163.33	184572	27964	464099	306023
30%	131636.67	145000	27680	371790	293222
40%	131524	123340	27696	369743	219859
50%	118391.33	108104	27656	314544	239319

60%	125865.67	110648	27696	273160	231430
70%	108269.33	96788	27588	295465	210137
80%	103530	87028	27680	234571	157625
90%	80432.333	74164	27664	51188	120938

Number of Frequent Subgraphs**(H) strategy**

Min Sup	SP (H)	F (H)	D (H)	GO (H)	MFP (H)	MSP (H)
1%						-
2%			7231	456922	456930	-
3%	79304	79297	3562	79297	79304	-
4%	33424		2256	33418	33424	-
5%	18104	18098	1589	18098	18104	-
6%	11174		1216	11169	11174	-
7%	7497	7492	934	7492	7497	-
8%	5423		782	5418	5423	-
9%	4082	4077	657	4077	4082	-
10%	3247		556	3242	3247	-
20%	626	622	196	622	626	626
30%	276	273	88	273	276	276
40%	121		59	118	121	121
50%	72	69	39	69	72	72
60%	45	42	21	42	45	45
70%	28	25	12	25	28	28
80%	16	13	9	13	16	16
90%	5	4	4	4	5	5

(L) strategy

Min Sup	SP (L)	SO SO64	F (L)	GO (L) GR (L)	GP (L)	FF (L)
1 %				235740772		
1.5 %				5557317		
2%	460034	460034	460026	460026	461469	460034
3%	79786	79785		79779	79421	79786
4%	33534	33534	33528	33528	33557	33534

5%	18141	18141		18135	18143	18141
6%	11194	11194	11189	11189	11195	11194
7%	7516	7516		7511	7517	7516
8%	5433	5433	5428	5428	5433	5433
9%	4087	4087		4082	4087	4087
10%	3250	3250	3245	3245	3250	3250
20%	626	626	622	622	626	626
30%	276	276	273	273	276	276
40%	122	122	119	119	122	122
50%	72	72	69	69	72	72
60%	45	45	42	42	45	45
70%	28	28	25	25	28	28
80%	16	16	13	13	16	16
90%	5	5	4	4	5	5

8. DD dataset

Runtime

(H) strategy

Min Sup	SP (H)	F (H)	D (H)	GO (H)	MFP (H)	MSP (H)
1%	-	-				-
2%	-	-				-
3%	23671.860	-	51649	308.672	9180.734	-
3.5%		-				-
4%	6609.033	-		173.592	2774.190	-
5%	3221.117	-	15643 .3	116.656	1422.145	-
6%	1806.881	-		83.613	861.953	-
7%	1196.951		7343.67	63.082	558.406	-
8%	829.105			50.077	416.169	-
9%	631.733		4324.68	41.216	308.537	-
10%	517.087	5276.767	3576.95	35.247	239.849	4420.162
20%	118.88	1266.267	929.739	11.333	62.833	351.825
30%	56.905		440.997	5.576	27.852	103.425
40%	35.698		273.001	3.411	15.95	48.905
50%	26.489	71.066	190.311	2.186	10.786	28.404
60%	21.755	18.833	117.741	1.437	7.421	16.338

70%	18.827	10.6	62.528	0.944	5.085	9.024
80%	17.41	10.133	40.427	0.698	4.06	6.237
90%	15.615	10.033	18.637	0.435	3.257	3.944

(L) strategy

Min Sup	SP (L)	SO64 (128GB)	SO64	SO	GP (L)	GO (L)	GR (L)	F (L)	FF (L)
1%	-		-	126008	-	7000.45	-	-	
1.5%	-		-		-	1815.02	-	-	
2%	-		-	8306.11	-	841.33	3873.99	-	> 46800
3%			-	3131.39	-	427.4	1575.72	-	10169.834
3.5%			-		1278.68	231.545		-	
4%	7484.763		-	1602.39	818.336	175.763	859.023	-	3280.561
5%	3321.77		-	1058.5	484.267	122.407	583.376	-	1630.431
6%	1959.222		-	715.107	299.682	83.565	395.59	-	1038.106
7%	1222.272		-	521.864	202.623	65.812	289.372	14756.7	695.327
8%	878.502		-	399.721	152.288	49.993	222.719	6949.7	504.663
9%	631.733		-	323.154	120.475	40.820	174.017	9814.2	390.169
10%	557.082	314.791	-	261.639	111.183	34.814	151.065		316.781
20%	134.919		71.045	70.976	36.514	11.149	33.400		78.164
30%	62.06		30.018	31.549	19.275	5.516	12.242	540.2333	34.002
40%	38.534		16.167	17.952	12.742	3.366	5.950	223.5667	19.85
50%	26.489		9.795	11.850	10.255	2.186	3.373	71.066	14.339
60%	22.903		5.940	7.904	6.307	1.373	1.854		8.192
70%	19.764		3.462	5.531	4.608	0.896	0.976		5.185
80%	17.41		2.525	4.571	4.006	0.698	0.666	10.133	3.9
90%	15.515		1.701	3.805	3.201	0.435	0.429	10.033	2.903

Memory Consumption**(H) strategy**

Min Sup	SP (H)	D (H)	GO (H)	MFP (H)	MSP (H)
1%	-				-
2%	-				-
3%	2999323	1504440	53500	2522350	-
3.5%					-
4%	1398670		52096	1190116	-

5%	833211	1502828	50708	721694	-
6%	549647		49616	470567	-
7%	398072	1497508	48892	338051	-
8%	305774		47704	253215	-
9%	248857	1498120	47600	203689	> 3237375 OutOfMemory
10%	210116.33	1487836	46552	172385	2821204
20%	97859.667	1475036	42820	68655	583527
30%	79957.667	1464336	40544	51721	270615
40%	75145	1446876	38988	45285	142111
50%	73848.667	1434036	37116	49685	109832
60%	72545.333	1420900	35016	49691	82955
70%	69294.667	1420808	32328	49685	81695
80%	67381.333	1420904	30492	41246	81449
90%	64932	1420780	26324	41243	80717

(L) strategy

Min Sup	SP (L)	GP (L)	GO (L)	GR (L)	FF (L)
1%	-	-	66944	-	
1.5%	-	-	58616	Killed	
2%	-	-	55832	2744180	> 3113876
3%	>3118779	> 3000000	53664	805680	1611942
3.5%		2114479	52764		
4%	1400000	1491985	51952	379892	831209
5%	876848	876978	50964	251812	551297
6%	567610	582024	49476	192200	422657
7%	406642	421690	48852	163348	377527
8%	311286	324045	48116	148088	336444
9%	252844	266390	47452	139216	309033
10%	212917.33	232380	46612	134124	294893
20%	98319.667	123346	43120	122208	192904
30%	80096.667	100933	40904	121172	170525
40%	75096.667	99735	38832	120908	140906
50%	73848.667	92904	37116	120912	120513
60%	72588.667	91350	34968	120900	117246
70%	71332	82880	32040	120936	92619
80%	67381.333	85620	30492	120624	82182

90%	64932	81314	26324	120644	58737
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Number of Frequent Subgraphs

(H) strategy

Min Sup	SP (H)	F (H)	D (H)	GO (H)	MFP (H)	MSP (H)
1%	-	-				-
2%	-	-				-
3%	3124279	-	3124258	3124532	3124279	-
3.5%		-				-
4%	1357447	-		1357525	1357447	-
5%	758461	-	758441	758500	758461	-
6%	450623	-		450619	450623	-
7%	291592		291572	291588	291592	-
8%	200662			200651	200662	-
9%	144376		144356	144362	144376	-
10%	110151	110131	110131	110139	110151	110151
20%	16059	16039	16039	16045	16059	16059
30%	4670		4650	4651	4670	4670
40%	1932		1912	1912	1932	1932
50%	947	927	927	927	947	947
60%	439	419	419	419	439	439
70%	193	173	173	173	193	193
80%	113	93	93	93	113	113
90%	47	29	29	29	47	47

(L) strategy

Min Sup	SP (L)	SO	SO64	GP (L)	GO (L)	GR (L)	F (L)	FF (L)
1%	-	159782388	-	-	159820929	-	-	-
1.5%	-		-	-	32855900	-	-	-
2%	-	12225056	-	-	12226490	12225131	-	-
3%	-	3395899	-	-	3396232	3395766	-	3395899
3.5%			-	2135731	2135896			
4%	1441717	1441717	-	1441717	1441766	1441594	-	1441717
5%	795696	795696	-	795696	795717	795623	-	795696
6%	469001	469001	-	469001	468997	468944	-	469001
7%	301488	301488	-	301488	301484	301444	301468	301488
8%	206627	206627	-	206627	206619	206591	206607	206627
9%	148187	148187	-	148187	148175	148175	148167	148187
10%	112760	112760	-	112760	112750	112736		112760
20%	16254	16254	16254	16254	16238	16234		16254

30%	4720	4720	4720	4720	4700	4700	4700	4720
40%	1942	1942	1942	1942	1922	1922	1922	1942
50%	947	947	947	947	927	927	927	947
60%	441	441	441	441	421	421		441
70%	194	194	194	194	174	174		194
80%	113	113	113	113	93	93	93	113
90%	47	47	47	47	29	29	29	47

9. NCI250 dataset

Runtime

(H) strategy

Min Sup	SP (H)	F (H)	D (H)	MFP (H)	MSP (H)	MOa	MOb
1%			-	-	-	-	-
2%	8882.232		-	-	-	-	-
3%	3010.028	1203.3	-	-	-	-	-
4%	2123.009	902.8	-	-	-	-	-
5%	1624.373	735.9	-	-	-	-	-
6%	1301.75	638.2	-	-	-	-	-
7%	1138.508	562.6	-	> 54000	-	-	-
8%	1006.184	503.7	-	4459.141	-	-	-
9%	909.589	459.1	-	3749.953	-	-	-
10%	762.94	422.1	-	3408.069	-	-	-
15%		312.5	-		-	-	-
20%	372.987	251.3	-		-	-	-
30 %	256.792	172.3	-	1220.694	-	-	-
40%	193.709	134.9	-	1165.547	-	-	-
50 %	154.616	113.9	-	837.187	-	-	-
60%	106.885	82.2	-	380.890	-	-	-
70 %	62.658	70.3	-	158.401	793.331	480.246	-
80%	46.581	63.7	-	120.108	744.160	97.036	-
90%	32.01	56.2	-	45.075	214.408	150.467	281.046

(L) strategy

Min Sup	GO (L)	GR (L)	GP (L)	SP (L)	SO64	SO	FF (L)	F (L)
1%	728.423	-	-		-	32271.9	-	
2%	227.194	-	-	8831.518	-	6742.51	-	2371.5
3%	120.863	-	-	3010.028	-	2555.35	-	1203.3
4%	116.349	-	-	2123.009	1105.89	1306.08	-	902.8
5%	60.420	-	-	1624.373	831.161	991.757	-	735.9
6%	57.814	-	-	1301.75	817.48	677.122	-	638.2
7%	59.675	-	-	1138.508	692.261	586.234	-	562.6
8%	45.721	-	-	1006.184	599.281	490.524	-	503.7
9%	44.435	-	-	909.589	441.485	437.21	-	459.1
10%	31.926	-	-	762.94	404.843	467.658	-	422.1
15%	22.023	-	-		261.327	321.327	-	312.5
20%	17.357	-	-	372.987	202.846	252.25	-	251.3
30%	19.547	-	-	256.792	131.709	170.871	2139.069	172.3
40%	9.440	-	-	193.709	98.404	134.762	1198.686	134.9
50%	8.734	-	1464.823	154.616	83.232	115.76	956.454	113.9
60%	5.738	-	393.549	106.885	57.941	88.091	764.902	82.2
70%	6.998	-	63.641	62.658	34.342	61.155	280.485	70.3
80%	3.233	-	41.705	44.581	23.341	47.573	326.844	63.7
90%	2.341	-	22.219	32.81	13.831	37.845	119.911	56.2

Memory Consumption**(H) strategy**

Min Sup	SP (H)	D (H)	MFP (H)	MSP (H)	MOa	MOb
1 %		-	-	-	-	-
2%	1862793	-	-	-	-	-
3 %	1672020	-	-	-	-	-
4 %	1586105	-	-	-	-	-
5%	1507602	-	>2988534 OutOfMemory	-	-	-
6 %	1480934	-	-	-	-	-
7 %	1454384	-	Blocked	-	-	-
8 %	1436489	-	2576080	-	-	-

9 %	1400931	-	2567025	-	-	-
10%	1367810	-	2467956	-	-	-
15%		-		-	-	-
20%	1256068	-		-	-	-
30 %	1226589	-	2440851	-	-	-
40%	1198693	-	2439933	-	-	-
50 %	1195168	-	2432729	-	OutOfMemory	-
60%	1172061	-	2216041	> 3096063 OutOfMemory	Machine Blocked	-
70 %	967011	-	1862082	2673107		-
80%	818277	-	1862150	2684542		OutOfMemory
90 %	761760	Machine Blocked	1611619	2371962		

(L) strategy

Min Sup	GP (L)	GO (L)	GR (L)	SP (L)	FF (L)
1%	-	3033448	-		-
2%	-	2759732	-	1874656	-
3%	-	2378592	-	1672020	-
4%	-	2058392	-	1586105	-
5%	-	1876436	-	1507602	-
6%	-	1700224	-	1480934	-
7%	-	1338328	-	1454384	-
8%	-	1485096	-	1436489	-
9%	-	1479680	-	1400931	-
10%	-	1412128	-	1367810	-
15%	-	1165289	-		-
20%	-	1077120	-	1256068	> 2988067 OutOfMemory
30%	-	935496	-	1226589	2901644
40%	> 3026916	872588	-	1198693	2638080
50%	2970376	840472	-	1195168	2583702
60%	2557084	765104	-	1172061	2416782
70%	2039548	666832	-	967011	2349940
80%	1635725	624300	-	818277	2277222
90%	1242205	374800	Segmentation Fault	761760	2139208

Number of Frequent Subgraphs

(H) strategy

Min Sup	F (H)	SP (H)	D (H)	MFP (H)	MSP (H)	MOa	MOb
1%			-	-	-	-	-
2%		14056	-	-	-	-	-
3%	5913	5921	-	-	-	-	-
4%	3507	3514	-	-	-	-	-
5%	2386	2391	-	-	-	-	-
6 %	1741	1746	-	-	-	-	-
7 %	1310	1315	-	-	-	-	-
8%	1018	1023	-	1023	-	-	-
9 %	819	824	-	824	-	-	-
10%	647	652	-	652	-	-	-
15%	331		-		-	-	-
20%	196	200	-		-	-	-
30%	86	89	-	89	-	-	-
40%	49	52	-	52	-	-	-
50%	35	38	-	38	-	-	-
60%	18	21	-	21	-	-	-
70%	8	11	-	11	11	7	-
80%	4	6	-	6	6	3	-
90%	1	2	-	2	2	2	2

(L) strategy

Min Sup	SP (L)	SO64	SO	GO (L)	GR (L)	F (L)	GP (L)	FF (L)
0.5%		-			-	311876	-	-
1%		-	70413	70405	-		-	-
2%	14063	-	14063	14056	-	14055	-	-
3%	5921	-	6852	5913	-	5913	-	-
4%	3514	3514	3514	3507	-	3507	-	-
5%	2391	2391	2391	2386	-	2386	-	-
6%	1746	1746	1746	1741	-	1741	-	-
7%	1315	1315	1315	1310	-	1310	-	-
8%	1023	1023	1023	1018	-	1018	-	-

9%	824	824	824	819	-	819	-	-
10%	652	652	652	647	-	647	-	-
15%		336	336	331	-	331	-	-
20%	200	200	200	196	-	196	-	-
30%	89	89	89	86	-	86	-	89
40%	52	52	52	49	-	49	-	52
50%	38	38	38	35	-	35	38	38
60%	21	21	21	18	-	18	21	21
70%	11	11	11	8	-	8	11	11
80%	6	6	6	4	-	4	6	6
90%	2	2	2	1	-	1	2	2

10. DS3 dataset

Runtime

(H) strategy

Min Sup	F (H)	D (H)
1%		-
2%		-
3 %	1463.1	-
4 %	1083.9	-
5%	891.8	-
6 %	768,6	-
7 %	678	-
8 %	606.2	-
9 %	548.3	-
10%	505.7	-
20%	296.2	-
30%	201.633	
40 %	159	-
50%	130.266	-
60 %	95.5	-
70 %	77.8	-
80%	70.8	-
90%	61.9	-

(L) strategy

Min Sup	SO64	SO	GO (L)	GR (L)	F (L)
1%	-	42872	1027.74	-	13657.7
2%	-	8130.19	302.106	-	2822.4
3%	-		152.622	-	
4%	-	1573.6	108.392	-	
5%	1065.02	1188.07	104.924	-	891.8
6%	861.287	981.141	71.49	-	768.6
7%	713.547	833.118	59.224	-	678
8%	615.542	717.864	52.762	-	606.2
9%	546.191	638.302	53.431	-	548.3
10%	470.396	584.814	42.802	-	505.7
15%	327.759			-	
20%	233.282	298.556	24.054	-	296.2
30%	154.118	202.158	14.725	-	201.633
40%	113.69	153.735	14.974	-	159
50%	92.842	130.899	9.188	-	130.266
60%	74.388	110.036	11.277	-	95.5
70%	36.237	64.652	4.576	-	77.8
80%	24.204	51.328	3.748	-	70.8
90%	18.074	45.109	3.097		61.9

Memory Consumption**(H) strategy**

Min Sup	D (H)
1 %	-
2%	-
3 %	-
4 %	-
5%	-
6 %	-
7 %	-
8 %	-

9%	-
10%	-
20%	-
30%	-
40 %	-
50%	-
60 %	-
70 %	-
80 %	-
90 %	<i>Machine Blocked</i>

(L) strategy

Min Sup	GO (L)	GR (L)
1 %	3429596	-
2%	3067400	-
3 %	2636676	-
4 %	2325272	-
5%	2017376	-
6 %	1919616	-
7 %	1823468	-
8 %	1758420	-
9%	1662148	-
10%	1579568	-
20%	1231960	-
30%	1065331	-
40 %	1006236	-
50%	982292	-
60 %	928704	-
70 %	730084	-
80 %	656816	<i>Segmentation Fault</i>
90 %	511540	

Number of Frequent Subgraphs

(H) strategy

Min Sup	D (H)	F (H)
1 %	-	
2%	-	
3 %	-	6534
4 %	-	3910
5%	-	2651
6 %	-	1909
7 %	-	1414
8 %	-	1116
9%	-	889
10%	-	725
20%	-	207
30%	-	93
40 %	-	50
50%	-	35
60 %	-	18
70 %	-	8
80 %	-	4
90%	-	1

(L) strategy

Min Sup	SO SO64	GO (L)	GR (L)	F (L)
1 %	83318	83310	-	80722
2%	16043	16035	-	15340
3 %		6844	-	
4 %	4082	4075	-	
5%	2744	2738	-	2651
6 %	1982	1977	-	1909
7 %	1461	1456	-	1414
8 %	1146	1141	-	1116
9%	923	918	-	889
10%	765	760	-	725
15%	376		-	

20%	216	212	-	207
30%	98	95	-	93
40 %	55	52	-	50
50%	38	35	-	35
60 %	28	25	-	18
70 %	11	8	-	8
80 %	6	4	-	4
90 %	3	2		1

11. DS3M dataset

Runtime

(H) strategy

Min Sup	SP (H)	F (H)	D (H)	MFP (H)	MSP (H)
1%			-	-	-
2%	11060.361		-	-	-
3 %	4107.219	1459.4	-	-	-
4 %	2804.182	1085.1	-	-	-
5%	2052.891	891.8	-	-	-
6 %	1663.221	768.8	-	-	-
7 %	1385.462	678,6	-	8981.272	-
8 %	1263.119	617.4	-	6691.814	-
9 %	1233.581	547.5	-		-
10%	992.628	505.7	-	6528.942	-
20 %	459.057	296.2	-		-
30%	285.862	201.6	-	1765.009	-
40%	215.798	159	-		-
50%	176.864	130.2	-	1353.429	-
60 %	136.872	95.5	-		-
70%	70.019	77.8	-	271.852	-
80%	47.078	70.4	-	163.79	1306.251
90 %	33.629	61.9	-	98.038	1016.820

(L) strategy

Min Sup	SP (L)	SO64	SO	GO (L)	GR (L)	F (L)	GP (L)	FF (L)
1%		-	42768.4	957.059	-	13666.2	-	-
2%	10424.238	-		285.916	-	2822.4	-	-
3%	4347.845	-	3867.02	144.687	-		-	-
4%	2804.182	-		102.991	-	1085.1	-	-
5%	2052.891	-	2666.42	76.820	-	891.8	-	-
6%	1663.221	1790.85	2447.37	67.452	-	768.8	-	-
7 %	1385.462			57.809	-	678,6	-	-
8%	1263.119	1595.43	2158.99	56.662	-	617.4	-	-
9 %	1233.581			46.129	-	547.5	-	-
10%	992.628	1458.9	2085.98	40.263	-	505.7	-	-
20%	459.057		1830.25	21.113	-	296.2	-	-
30%	285.862	1224.7	1680.93	14.436	-	201.6	-	-
40%	215.798			11.606	-	159	-	2679.373
50%	176.864	1136.91	1650.01	9.080	-	130.2	2821.809	2294.910
60 %	136.872			6.843	-	95.5		
70%	70.019	1039.85	1552.33	6.197	-	77.8	121.161	1137.948
80%	47.078	1079.94	1527.71	3.708	-	70.4	1403.531	539.792
90%	33.629	1034.58	1558.49	2.625		61.9	27.526	247.863

Memory Consumption**(H) strategy**

Min Sup	SP (H)	D (H)	MFP (H)	MSP (H)
1 %		-	-	-
2%	2134499	-	-	-
3 %	1907881	-	-	-
4 %	1792894	-	-	-
5%	1727221	-	-	-
6 %	1675818	-	>3041784 <i>OutOfMemory</i>	-
7 %	1634845	-	2910712	-
8 %	1627357	-	2852199	-
9%	1588070	-		-

10%	1553951	-	2766773	-
20%	1396635	-		-
30%	1366875	-	2734799	-
40 %	1344820	-		-
50%	1338054	-	2738396	-
60 %	1311705	-		-
70 %	1089074	-	2062560	>3101183 OutOfMemory
80 %	906972	-	2060558	2947918
90 %	832046	Machine Blocked	1795283	2657535

(L) strategy

Min Sup	SP (L)	GO (L)	GR (L)	GP (L)	FF (L)
1 %		3113480	-	-	-
2%	2136220	3044760	-	-	-
3 %	1906856	2636220	-	-	-
4 %	1792894	2276132	-	-	-
5%	1727221	2080152	-	-	-
6 %	1675818	1881800	-	-	-
7 %	1634845	1782776	-	-	-
8 %	1627357	1649584	-	-	-
9%	1588070	1639080	-	-	-
10%	1553951	1568316	-	-	-
20%	1396635	1200280	-	-	-
30%	1366875	1032800	-	-	> 3027879 OutOfMemory
40 %	1344820	974324	-	> 3026599KB OutOfMemory	2937737
50%	1338054	951620	-	3344454	2906991
60 %	1311705	928704	-		
70 %	1089074	726240	-	2306790	2742415
80 %	906972	643920	Segmentation fault	2665024	2665024
90 %	832046	412192		1259167	2506495

Number of Frequent Subgraphs**(H) strategy**

Min Sup	SP (H)	F (H)	D (H)	MFP (H)	MSP (H)
1 %			-	-	-
2%	15346		-	-	-
3 %	6543	6534	-	-	-
4 %	3918	3910	-	-	-
5%	2659	2651	-	-	-
6 %	1915	1909	-	-	-
7 %	1420	1414	-	1420	-
8 %	1122	1116	-	1222	-
9%	895	889	-		-
10%	731	725	-	731	-
20%	212	207	-		-
30%	96	93	-	96	-
40 %	53	50	-		-
50%	38	35	-	38	-
60 %	21	18	-		-
70 %	11	8	-	11	-
80 %	6	4	-	6	6
90 %	2	1	-	2	2

(L) strategy

Min Sup	SP (L)	SO64	SO	GO (L)	GR (L)	GP (L)	FF (L)	F (L)
1 %		-	80747	80738	-	-	-	80722
2%	15349	-		15341	-	-	-	15340
3 %	6544	-	6544	6535	-	-	-	
4 %	3918	-		3910	-	-	-	3910
5%	2659	-	2658	2651	-	-	-	2651
6 %	1915	1915	1915	1909	-	-	-	1909
7 %	1420			1414	-	-	-	1414
8 %	1122	1122	1122	1116	-	-	-	1116
9%	895			889	-	-	-	889
10%	731	731	731	725	-	-	-	725
20%	212		211	207	-	-	-	207
30%	96	96	96	93	-	-	-	93
40 %	53			50	-	-	53	50
50%	38	38	38	35	-	38	38	35
60 %	21			18	-			18
70 %	11	11	11	8	-	11	11	8
80 %	6	6	6	4	-	6	6	4
90 %	2	2	2	1		2	2	1

12. PS dataset

Runtime

(H) strategy

Min Sup	SP (H)	GP (H)	F (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%	-	-	-	-		-	-
2%	-	-	-	-		-	-
3%	-	-	-	-		-	-
4%	-	-	-	-		-	-
5%	-	-	-	-		-	-
6%	-	-	-	-		-	-
7%	-	-	-	-		-	-
8%	-	-	-	-		-	-
9%	-	-	-	-		-	-
10%	-	-	-	-		-	-
20%	-	-	-	-		-	-
30%	-	-	-	-		-	-
40%	-	-	-	-		-	-
50%	-	-	-	-		-	-
60%	-	-		-	>316800	-	-
70%	> 1.5 days	-	4913	3629.633	32216.5	-	-
80%	10.528	3.827	24.9	7.381	231.169	150.297	-
90%	0.895	1.043	13.1	0.420	0.390	1.009	1.432

(L) strategy

Min Sup	SP (L)	SO64	SO	SK (128GB)	GO (L)	GR (L)	F (L)
1%	-	-		-			-
2%	-	-		-			-
3%	-	-		-			-
4%	-	-		-			-
5%	-	-		-			-
6%	-	-		-			-
7%	-	-		-			-

8%	-	-		-			-
9%	-	-		-			-
10%	-	-		-			-
20%	-	-		-			-
30%	-	-		-			-
40%	-	-		-			-
50%	-	-		>691200			-
60%	-	-	33935.5		15968.8	40395.4	<i>Not enough memory xmalloc</i>
70%	> 1.5 days	-	5499.5		618.489	1472.04	4913
80%	10.528	21.215	24.348		0.997	2.985	24.9
90%	0.895	0.087	0.134		0.020	0.017	13.1

Memory Consumption

(H) strategy

Min Sup	SP (H)	GP (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%	-	-	-		-	-
2%	-	-	-		-	-
3%	-	-	-		-	-
4%	-	-	-		-	-
5%	-	-	-		-	-
6%	-	-	-		-	-
7%	-	-	-		-	-
8%	-	-	-		-	-
9%	-	-	-		-	-
10%	-	-	-		-	-
20%	-	-	-		-	-
30%	-	-	-		-	-
40%	-	-	-		-	-
50%	-	-	-		-	-
60%	-	-	>2930175 OutOfMemory		-	-
70%	> 3018751 OutOfMemory	> 2891263 OutOfMemory	2569203	64752	> 2810875 OutOfMemory	>3100671 OutOfMemory
80%	30467	28122	18447	47864	24956	>3085310 OutOfMemory
90%	1320	1669	1453	47944	1624	2097

(L) strategy

Min Sup	SP (L)	GO (L)	GR (L)
1%	-		
2%	-		
3%	-		
4%	-		
5%	-		
6%	-		
7%	-		
8%	-		
9%	-		
10%	-		
20%	-		
30%	-		
40%	-		
50%	-		
60%	-	5976	428676
70%	> 3018751 OutOfMemory	4884	40636
80%	30467	4096	4780
90%	1320	3132	4260

Number of Frequent Subgraphs**(H) strategy**

Min Sup	SP (H)	GP (H)	F (H)	FF (H)	D (H)	MFP (H)	MSP (H)
1%	-	-	-	-		-	-
2%	-	-	-	-		-	-
3%	-	-	-	-		-	-
4%	-	-	-	-		-	-
5%	-	-	-	-		-	-
6%	-	-	-	-		-	-
7%	-	-	-	-		-	-
8%	-	-	-	-		-	-

9%	-	-	-	-		-	-
10%	-	-	-	-		-	-
20%	-	-	-	-		-	-
30%	-	-	-	-		-	-
40%	-	-	-	-		-	-
50%	-	-	-	-		-	-
60%	-	-	-	-		-	-
70%	-	-	3947130	3947147	3947130	-	-
80%	24083	24083	24067	24083	24067	24083	-
90%	35	35	22	35	22	35	27

(L) strategy

Min Sup	SP (L)	SO64	SO	GO (L)	GR (L)	F (L)
1%	-	-				-
2%	-	-				-
3%	-	-				-
4%	-	-				-
5%	-	-				-
6%	-	-				-
7%	-	-				-
8%	-	-				-
9%	-	-				-
10%	-	-				-
20%	-	-				-
30%	-	-				-
40%	-	-				-
50%	-	-				-
60%	-	-	37826222	63641199	63624186	-
70%	-	-	5856735	5680163	5680163	3947130
80%	24083	24083	24083	31482	31437	24067
90%	35	35	35	27	27	22

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