

# Results for MLIC for different parameter configurations

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Table 1: Table for DNF rules with  $k=1$  and  $\lambda = 1$

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	DNF	1	1.0	2000	0.965	0.964	3.0
Twitter	DNF	1	1.0	2000	0.939	0.939	8.0
adult	DNF	1	1.0	2000	0.778	0.732	43.0
credit-card	DNF	1	1.0	2000	0.779	0.778	15.0
ionosphere	DNF	1	1.0	16.05	0.935	0.886	5.5
parkinsons	DNF	1	1.0	9.98	0.881	0.83	1.0
pima	DNF	1	1.0	2000	0.702	0.68	4.0
transfusion	DNF	1	1.0	3.29	0.792	0.788	3.0
wdbc	DNF	1	1.0	876.96	0.946	0.921	5.0

Table 2: Table for DNF rules with  $k=1$  and  $\lambda = 5$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	DNF	1	5.0	2000	0.964	0.964	4.0
Twitter	DNF	1	5.0	2000	0.942	0.942	7.0
adult	DNF	1	5.0	2000	0.778	0.732	43.0
credit-card	DNF	1	5.0	2000	0.779	0.778	15.0
ionosphere	DNF	1	5.0	16.82	0.935	0.889	5.5
parkinsons	DNF	1	5.0	47.94	0.883	0.816	1.5
pima	DNF	1	5.0	2000	0.686	0.666	8.0
transfusion	DNF	1	5.0	11.8	0.792	0.785	3.0
wdbc	DNF	1	5.0	803.06	0.947	0.918	5.5

Table 3: Table for DNF rules with  $k=1$  and  $\lambda = 10$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	DNF	1	10.0	2000	0.964	0.965	3.5
Twitter	DNF	1	10.0	2000	0.937	0.938	8.0
adult	DNF	1	10.0	2000	0.778	0.732	43.0
credit-card	DNF	1	10.0	2000	0.779	0.778	15.0
ionosphere	DNF	1	10.0	14.79	0.935	0.889	5.5
parkinsons	DNF	1	10.0	65.63	0.884	0.811	1.5
pima	DNF	1	10.0	2000	0.691	0.679	8.0
transfusion	DNF	1	10.0	12.29	0.792	0.785	3.0
wdbc	DNF	1	10.0	777.71	0.947	0.918	5.5

Table 4: Table for DNF rules with  $k=2$  and  $\lambda = 1$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	DNF	2	1.0	2000	0.956	0.952	13.0
Twitter	DNF	2	1.0	2000	0.948	0.948	19.0
adult	DNF	2	1.0	2000	0.796	0.755	51.5
credit-card	DNF	2	1.0	2000	0.78	0.779	27.0
ionosphere	DNF	2	1.0	2000	0.971	0.886	12.5
parkinsons	DNF	2	1.0	140.75	0.962	0.895	6.0
pima	DNF	2	1.0	2000	0.747	0.728	9.5
transfusion	DNF	2	1.0	35.05	0.8	0.786	5.0
wdbc	DNF	2	1.0	2000	0.974	0.938	10.5

Table 5: Table for DNF rules with  $k=2$  and  $\lambda = 5$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	DNF	2	5.0	2000	0.956	0.952	13.0
Twitter	DNF	2	5.0	2000	0.948	0.948	20.0
adult	DNF	2	5.0	2000	0.798	0.753	56.0
credit-card	DNF	2	5.0	2000	0.78	0.778	26.5
ionosphere	DNF	2	5.0	1396.34	0.983	0.897	15.0
parkinsons	DNF	2	5.0	139.63	0.968	0.898	8.0
pima	DNF	2	5.0	2000	0.743	0.713	11.0
transfusion	DNF	2	5.0	2000	0.8	0.786	6.5
wdbc	DNF	2	5.0	2000	0.977	0.943	11.0

Table 6: Table for DNF rules with  $k=2$  and  $\lambda = 10$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	DNF	2	10.0	2000	0.956	0.956	12.0
Twitter	DNF	2	10.0	2000	0.947	0.946	21.0
adult	DNF	2	10.0	2000	0.796	0.754	53.0
credit-card	DNF	2	10.0	2000	0.78	0.779	25.0
ionosphere	DNF	2	10.0	960.3	0.983	0.909	15.0
parkinsons	DNF	2	10.0	102.18	0.968	0.889	8.0
pima	DNF	2	10.0	2000	0.741	0.72	11.0
transfusion	DNF	2	10.0	2000	0.801	0.764	7.0
wdbc	DNF	2	10.0	2000	0.978	0.943	12.0

Table 7: Table for DNF rules with  $k=3$  and  $\lambda = 1$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	DNF	3	1.0	2000	0.954	0.953	17.0
Twitter	DNF	3	1.0	2000	0.951	0.95	26.0
adult	DNF	3	1.0	2000	0.801	0.734	100.5
credit-card	DNF	3	1.0	2000	0.693	0.691	57.5
ionosphere	DNF	3	1.0	2000	0.972	0.883	20.0
parkinsons	DNF	3	1.0	2000	0.982	0.892	9.0
pima	DNF	3	1.0	2000	0.769	0.711	17.0
transfusion	DNF	3	1.0	155.75	0.807	0.784	8.0
wdbc	DNF	3	1.0	2000	0.956	0.925	17.0

Table 8: Table for DNF rules with  $k=3$  and  $\lambda = 5$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	DNF	3	5.0	2000	0.953	0.953	18.0
Twitter	DNF	3	5.0	2000	0.95	0.95	28.0
adult	DNF	3	5.0	2000	0.8	0.722	101.0
credit-card	DNF	3	5.0	2000	0.693	0.691	57.5
ionosphere	DNF	3	5.0	2000	0.943	0.857	20.5
parkinsons	DNF	3	5.0	1200.17	0.987	0.865	12.0
pima	DNF	3	5.0	2000	0.77	0.732	17.0
transfusion	DNF	3	5.0	2000	0.804	0.788	10.0
wdbc	DNF	3	5.0	2000	0.954	0.92	17.0

Table 9: Table for DNF rules with  $k=3$  and  $\lambda = 10$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	DNF	3	10.0	2000	0.954	0.953	17.0
Twitter	DNF	3	10.0	2000	0.949	0.947	27.0
adult	DNF	3	10.0	2000	0.803	0.739	88.5
credit-card	DNF	3	10.0	2000	0.693	0.691	57.5
ionosphere	DNF	3	10.0	2000	0.934	0.88	20.0
parkinsons	DNF	3	10.0	2000	0.995	0.832	11.5
pima	DNF	3	10.0	2000	0.768	0.712	17.0
transfusion	DNF	3	10.0	2000	0.805	0.774	10.0
wdbc	DNF	3	10.0	2000	0.953	0.932	16.5

Table 10: Table for CNF rules with  $k=1$  and  $\lambda = 1$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	CNF	1	1.0	2000	0.97	0.969	4.0
Twitter	CNF	1	1.0	2000	0.95	0.951	8.0
adult	CNF	1	1.0	2000	0.778	0.727	16.0
credit-card	CNF	1	1.0	2000	0.82	0.82	4.0
ionosphere	CNF	1	1.0	1670.68	0.821	0.789	1.0
parkinsons	CNF	1	1.0	17.14	0.906	0.855	4.0
pima	CNF	1	1.0	2000	0.67	0.67	5.0
transfusion	CNF	1	1.0	0.37	0.759	0.759	0.0
wdbc	CNF	1	1.0	928.16	0.95	0.943	3.0

Table 11: Table for CNF rules with  $k=1$  and  $\lambda = 5$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	CNF	1	5.0	2000	0.969	0.969	4.0
Twitter	CNF	1	5.0	2000	0.951	0.95	8.0
adult	CNF	1	5.0	2000	0.778	0.723	17.0
credit-card	CNF	1	5.0	2000	0.82	0.82	3.5
ionosphere	CNF	1	5.0	2000	0.79	0.754	2.5
parkinsons	CNF	1	5.0	55.54	0.914	0.855	5.5
pima	CNF	1	5.0	2000	0.672	0.671	5.0
transfusion	CNF	1	5.0	0.36	0.759	0.759	0.0
wdbc	CNF	1	5.0	1020.88	0.95	0.946	3.5

Table 12: Table for CNF rules with  $k=1$  and  $\lambda = 10$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	CNF	1	10.0	2000	0.969	0.969	4.5
Twitter	CNF	1	10.0	2000	0.951	0.951	8.0
adult	CNF	1	10.0	2000	0.777	0.723	17.0
credit-card	CNF	1	10.0	2000	0.82	0.82	4.0
ionosphere	CNF	1	10.0	2000	0.793	0.774	3.0
parkinsons	CNF	1	10.0	45.84	0.914	0.842	6.0
pima	CNF	1	10.0	2000	0.682	0.65	5.0
transfusion	CNF	1	10.0	0.36	0.759	0.759	0.0
wdbc	CNF	1	10.0	848.68	0.949	0.941	3.5

Table 13: Table for CNF rules with  $k=2$  and  $\lambda = 1$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	CNF	2	1.0	2000	0.933	0.933	3.0
Twitter	CNF	2	1.0	2000	0.959	0.958	15.0
adult	CNF	2	1.0	2000	0.742	0.712	28.5
credit-card	CNF	2	1.0	2000	0.61	0.61	15.0
ionosphere	CNF	2	1.0	2000	0.867	0.829	4.0
parkinsons	CNF	2	1.0	559.02	0.973	0.9	9.0
pima	CNF	2	1.0	2000	0.752	0.737	9.0
transfusion	CNF	2	1.0	2000	0.774	0.754	2.0
wdbc	CNF	2	1.0	2000	0.971	0.938	8.0

Table 14: Table for CNF rules with  $k=2$  and  $\lambda = 5$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	CNF	2	5.0	2000	0.942	0.942	6.5
Twitter	CNF	2	5.0	2000	0.957	0.957	15.0
adult	CNF	2	5.0	2000	0.742	0.712	28.5
credit-card	CNF	2	5.0	2000	0.61	0.61	15.0
ionosphere	CNF	2	5.0	2000	0.861	0.823	5.0
parkinsons	CNF	2	5.0	38.26	0.988	0.889	12.5
pima	CNF	2	5.0	2000	0.748	0.726	10.0
transfusion	CNF	2	5.0	2000	0.774	0.749	2.5
wdbc	CNF	2	5.0	2000	0.973	0.946	10.5

Table 15: Table for CNF rules with  $k=2$  and  $\lambda = 10$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	CNF	2	10.0	2000	0.938	0.869	6.5
Twitter	CNF	2	10.0	2000	0.957	0.957	15.0
adult	CNF	2	10.0	2000	0.742	0.712	28.5
credit-card	CNF	2	10.0	2000	0.61	0.61	15.0
ionosphere	CNF	2	10.0	2000	0.866	0.834	6.0
parkinsons	CNF	2	10.0	21.87	0.988	0.889	12.5
pima	CNF	2	10.0	2000	0.748	0.726	9.5
transfusion	CNF	2	10.0	2000	0.773	0.747	2.5
wdbc	CNF	2	10.0	2000	0.974	0.941	10.5

Table 16: Table for CNF rules with  $k=3$  and  $\lambda = 1$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	CNF	3	1.0	2000	0.944	0.943	8.0
Twitter	CNF	3	1.0	2000	0.956	0.955	25.0
adult	CNF	3	1.0	2000	0.755	0.721	42.0
credit-card	CNF	3	1.0	2000	0.703	0.704	19.0
ionosphere	CNF	3	1.0	2000	0.744	0.68	14.5
parkinsons	CNF	3	1.0	1600.56	0.994	0.874	12.5
pima	CNF	3	1.0	2000	0.765	0.722	13.5
transfusion	CNF	3	1.0	913.86	0.798	0.797	4.0
wdbc	CNF	3	1.0	2000	0.955	0.93	12.5

Table 17: Table for CNF rules with  $k=3$  and  $\lambda = 5$ 

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	CNF	3	5.0	2000	0.946	0.939	7.5
Twitter	CNF	3	5.0	2000	0.956	0.957	24.0
adult	CNF	3	5.0	2000	0.755	0.721	42.0
credit-card	CNF	3	5.0	2000	0.703	0.704	19.0
ionosphere	CNF	3	5.0	2000	0.784	0.726	13.0
parkinsons	CNF	3	5.0	1200.13	1.0	0.897	14.0
pima	CNF	3	5.0	2000	0.765	0.734	14.0
transfusion	CNF	3	5.0	2000	0.794	0.78	4.0
wdbc	CNF	3	5.0	2000	0.956	0.929	12.0

Table 18: Table for CNF rules with  $k=3$  and  $\lambda = 10$

Benchmark	Rule Type	$k$	$\lambda$	Time Taken	Train Accuracy	Test Accuracy	Rule Size
TomsHardware	CNF	3	10.0	2000	0.943	0.941	8.5
Twitter	CNF	3	10.0	2000	0.956	0.954	24.0
adult	CNF	3	10.0	2000	0.755	0.721	42.0
credit-card	CNF	3	10.0	2000	0.703	0.704	19.0
ionosphere	CNF	3	10.0	2000	0.788	0.703	13.5
parkinsons	CNF	3	10.0	2000	1.0	0.905	13.0
pima	CNF	3	10.0	2000	0.765	0.743	15.5
transfusion	CNF	3	10.0	2000	0.794	0.785	4.0
wdbc	CNF	3	10.0	2000	0.953	0.929	11.5