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A Study of Learning Likely Data Structure Properties Using Off-the-shelf Tools

Supplementary Material

Muhammad Usman · Wenxi Wang · Kaiyuan Wang · Cagdas Yelen · Nima Dini · Sarfraz Khurshid

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Muhammad Usman
The University of Texas at Austin, Austin TX 78712, USA
E-mail: muhammadusman@utexas.edu

Wenxi Wang
The University of Texas at Austin, Austin TX 78712, USA
E-mail: wenxiw@utexas.edu

Kaiyuan Wang
The University of Texas at Austin, Austin TX 78712, USA
E-mail: kaiyuanw@utexas.edu

Cagdas Yelen
The University of Texas at Austin, Austin TX 78712, USA
E-mail: cagdas@utexas.edu

Nima Dini
The University of Texas at Austin, Austin TX 78712, USA
E-mail: nima.dini@utexas.edu

Sarfraz Khurshid
The University of Texas at Austin, Austin TX 78712, USA
E-mail: khurshid@utexas.edu

Fig. 1 ML Models performance for Binary Heap (Fixed Size - Standard Encoding) and in respect to 5 ratios

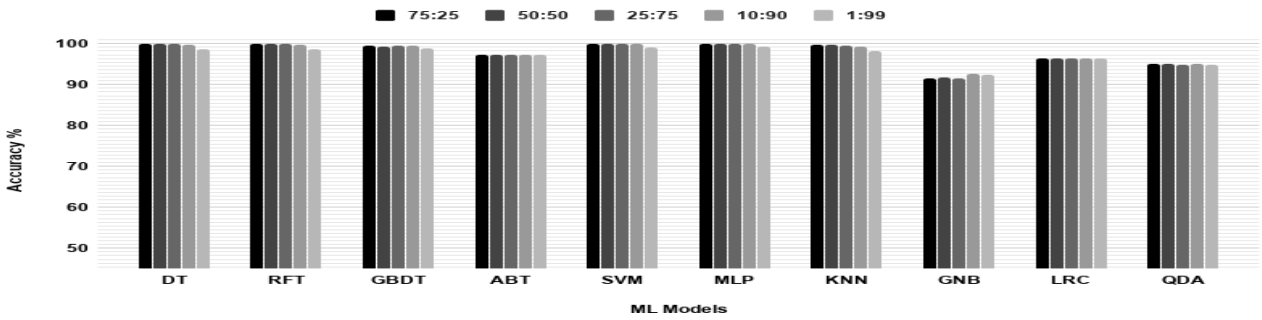

Fig. 2 ML Models performance for Binary Search Tree (Fixed Size - Standard Encoding) and in respect to 5 ratios

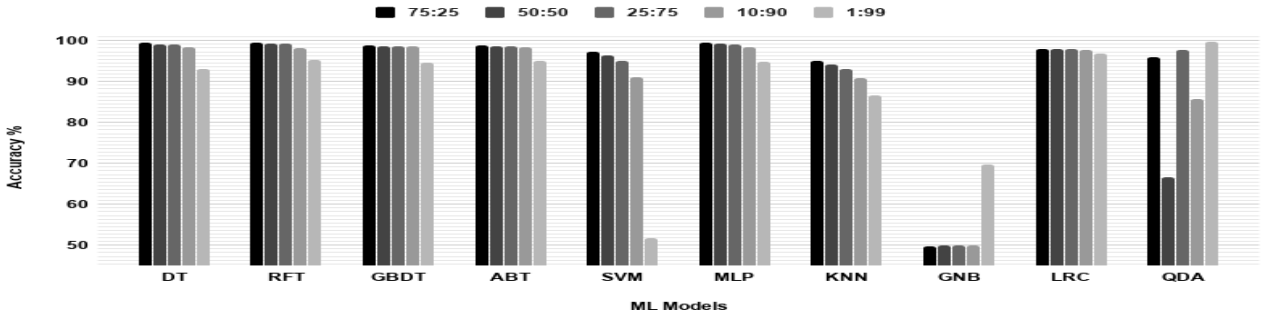

Fig. 3 ML Models performance for Binary Tree (Fixed Size - Standard Encoding) and in respect to 5 ratios

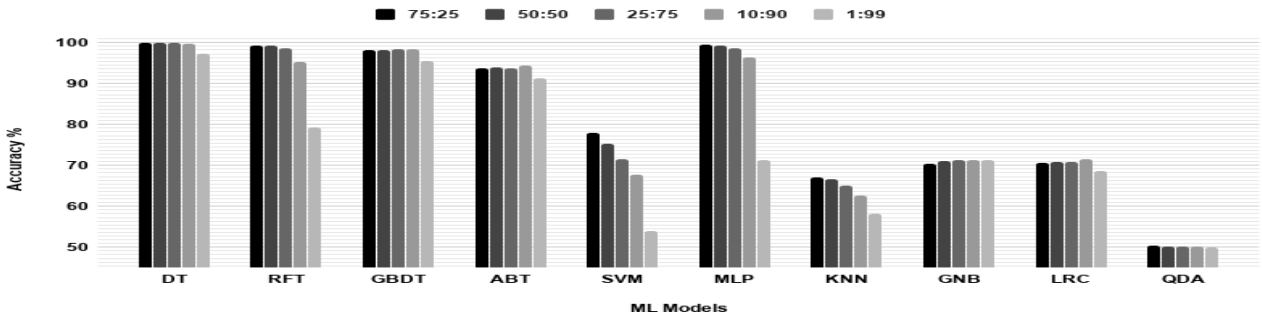

Fig. 4 ML Models performance for Directed Acyclic Graph (Fixed Size - Standard Encoding) and in respect to 5 ratios

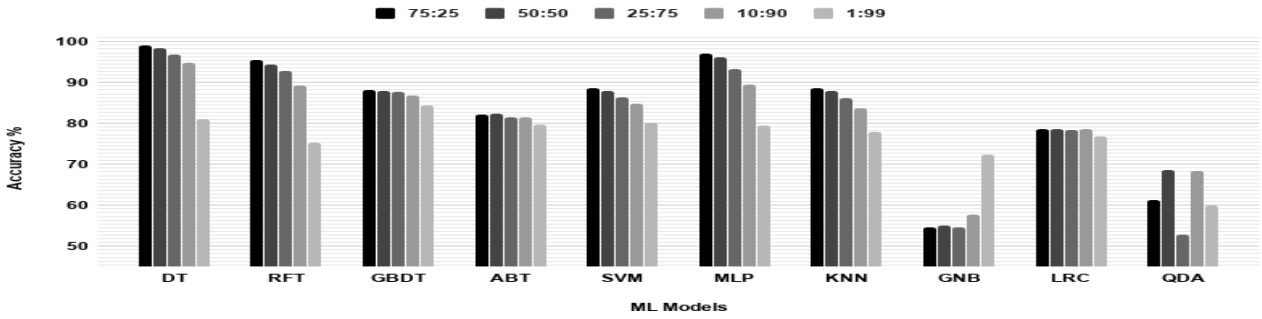

Fig. 5 ML Models performance for Disjoint Set (Fixed Size - Standard Encoding) and in respect to 5 ratios

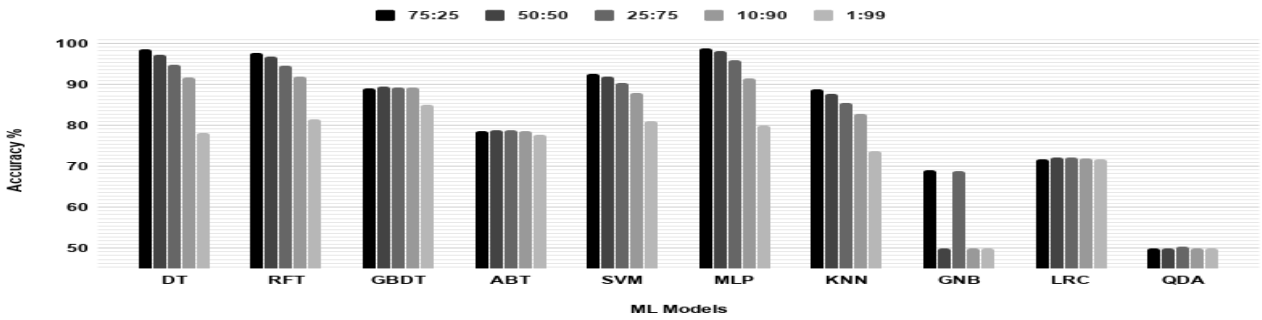

Fig. 6 ML Models performance for Fibonacci Heap (Fixed Size - Standard Encoding) and in respect to 5 ratios

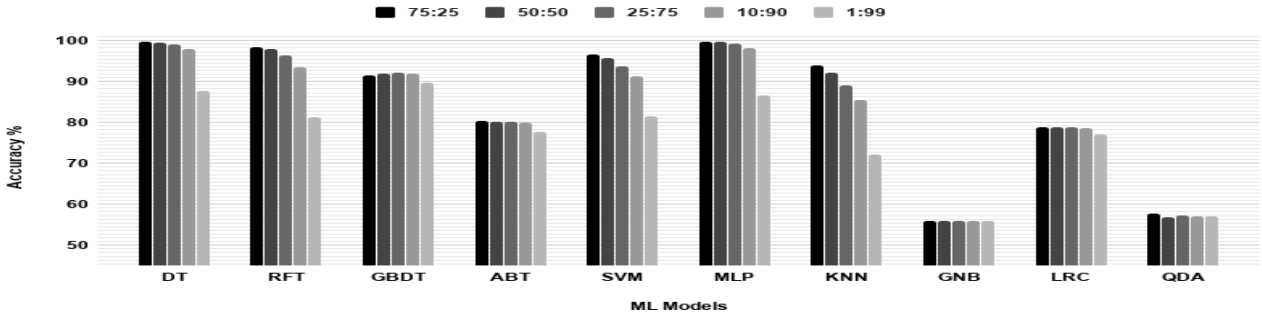

Fig. 7 ML Models performance for Heap Array (Fixed Size - Standard Encoding) and in respect to 5 ratios

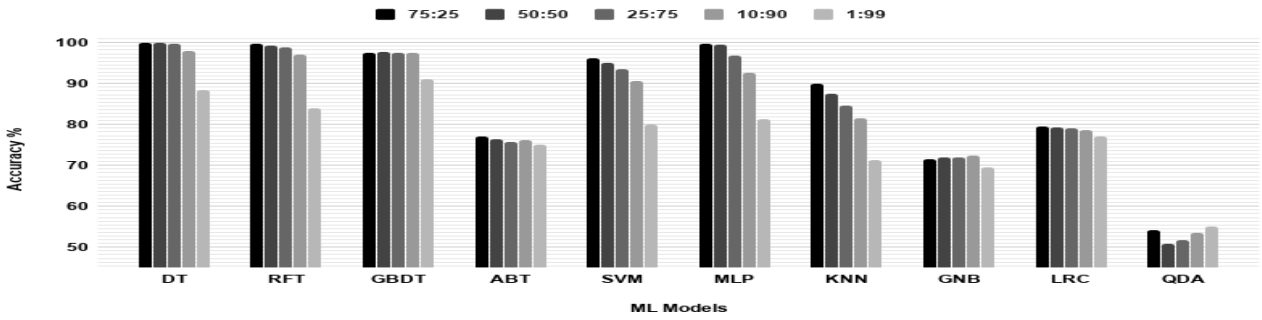

Fig. 8 ML Models performance for Red-Black Tree (Fixed Size - Standard Encoding) and in respect to 5 ratios

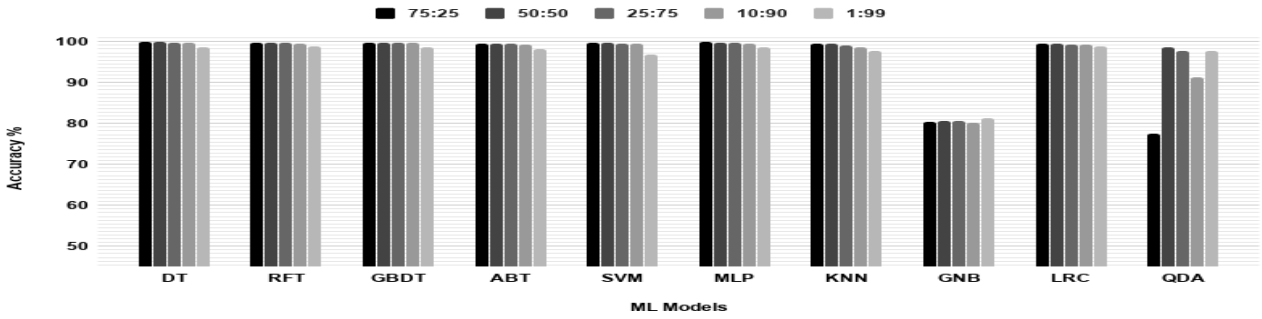

Fig. 9 ML Models performance for Sorted List (Fixed Size - Standard Encoding) and in respect to 5 ratios

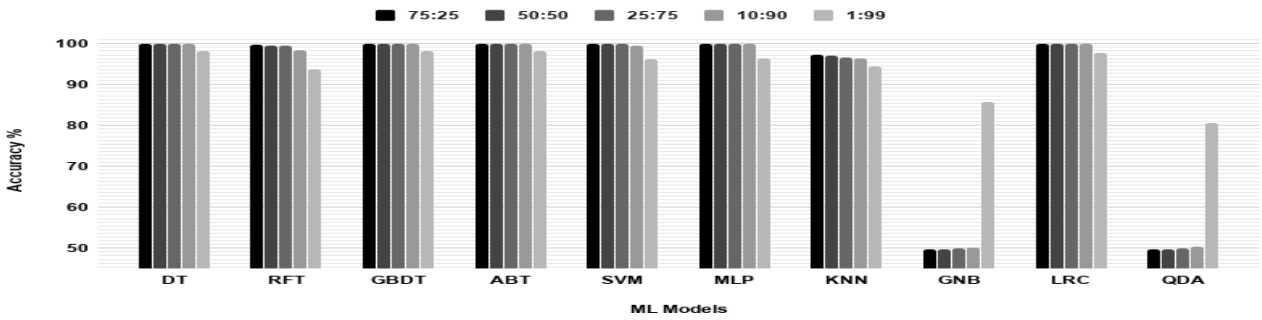

Fig. 10 ML Models performance for Singly Linked List (Fixed Size - Standard Encoding) and in respect to 5 ratios

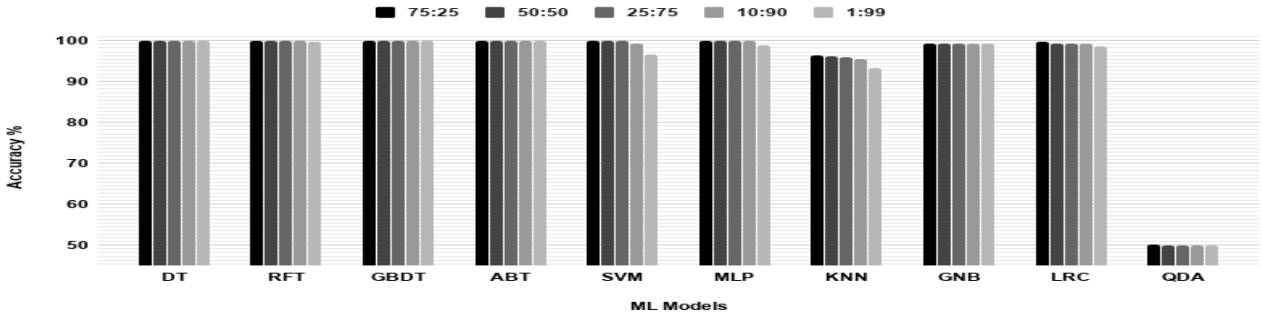

Fig. 11 ML Models performance for Binary Search Tree (Upto Size - Standard Encoding) and in respect to 5 ratios

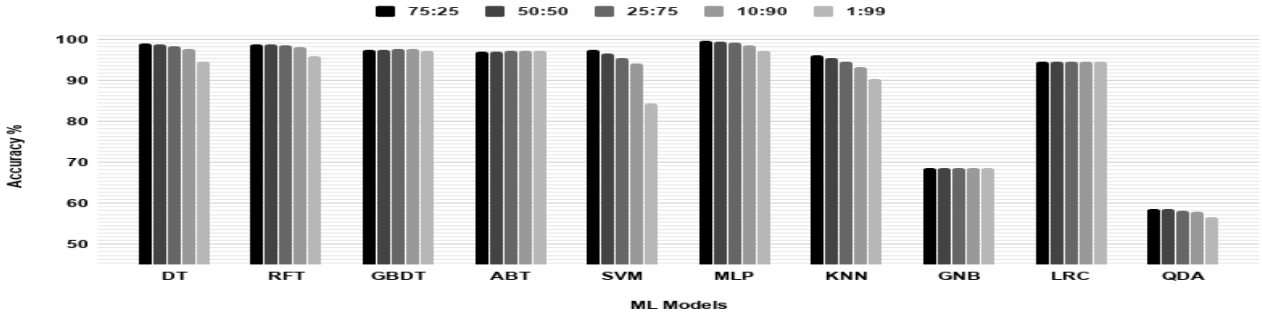

Fig. 12 ML Models performance for Binary Tree (Upto Size - Standard Encoding) and in respect to 5 ratios

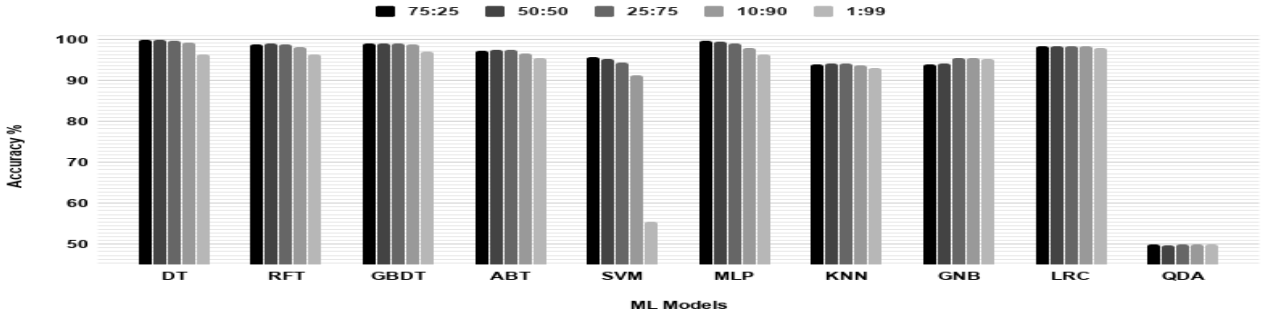

Fig. 13 ML Models performance for Red-Black Tree (Upto Size - Standard Encoding) and in respect to 5 ratios

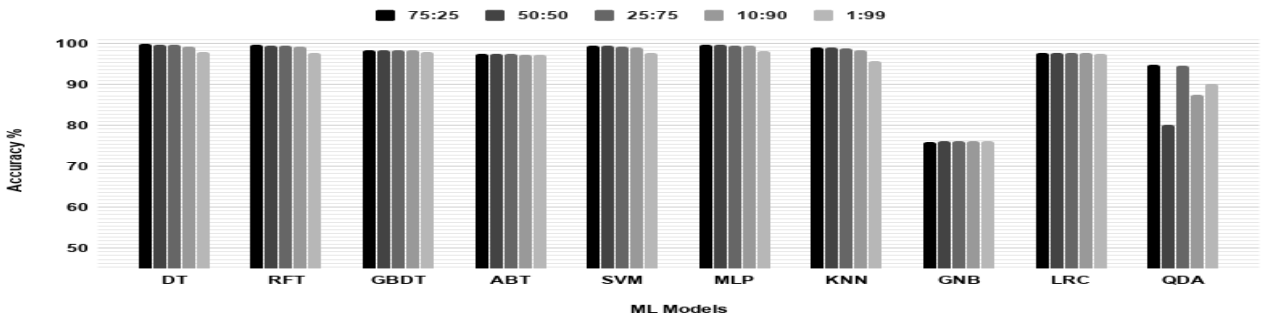

Fig. 14 ML Models performance for Sorted List (Upto Size - Standard Encoding) and in respect to 5 ratios

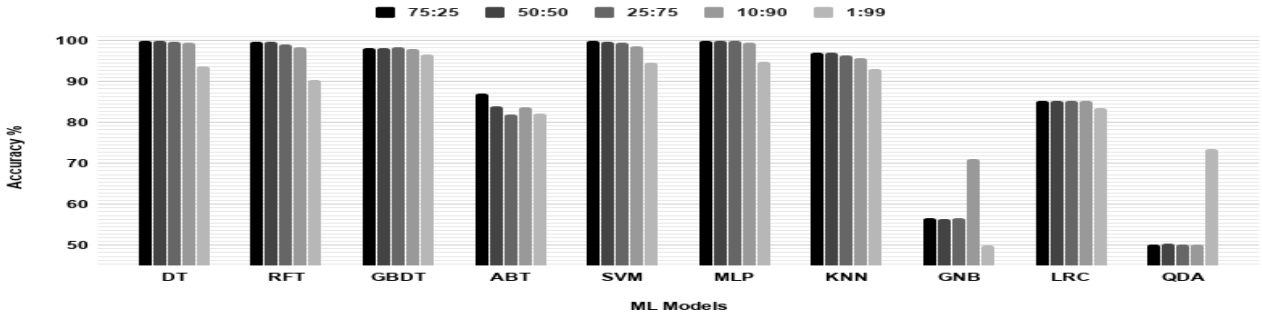

Fig. 15 ML Models performance for Singly Linked List (Upto Size - Standard Encoding) and in respect to 5 ratios

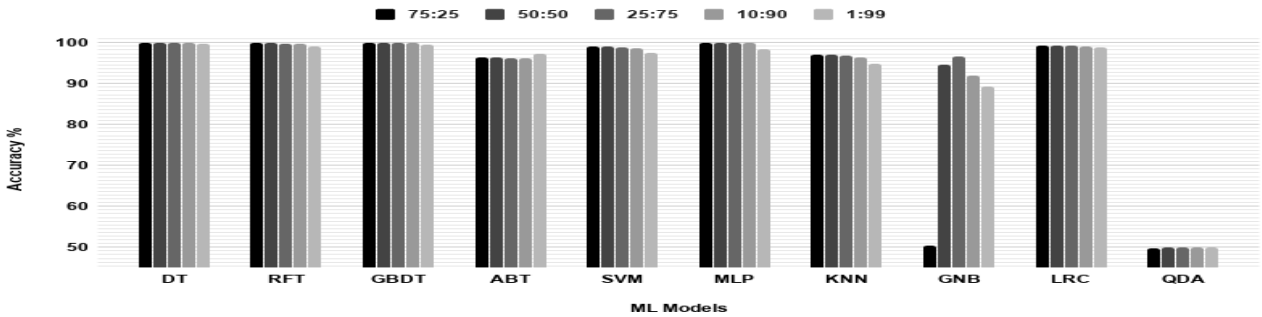

Fig. 16 ML Models performance for Binary Heap (Fixed Size - OHE Encoding) and in respect to 5 ratios

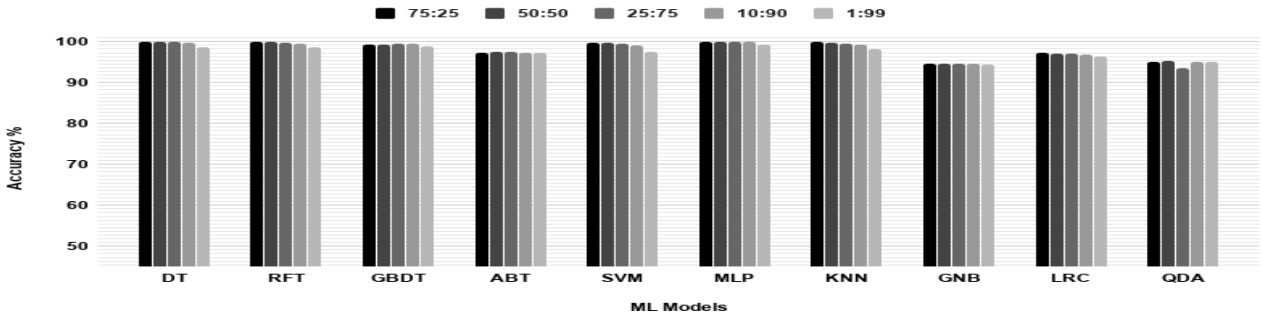

Fig. 17 ML Models performance for Binary Search Tree (Fixed Size - OHE Encoding) and in respect to 5 ratios

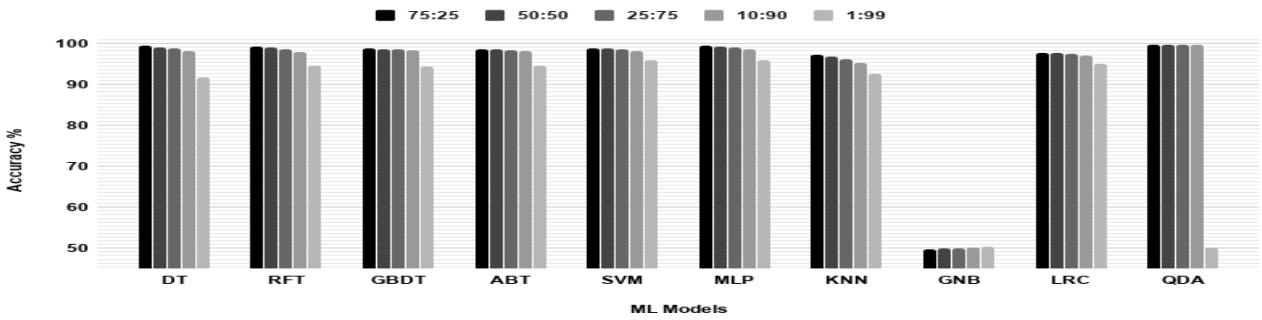

Fig. 18 ML Models performance for Binary Tree (Fixed Size - OHE Encoding) and in respect to 5 ratios

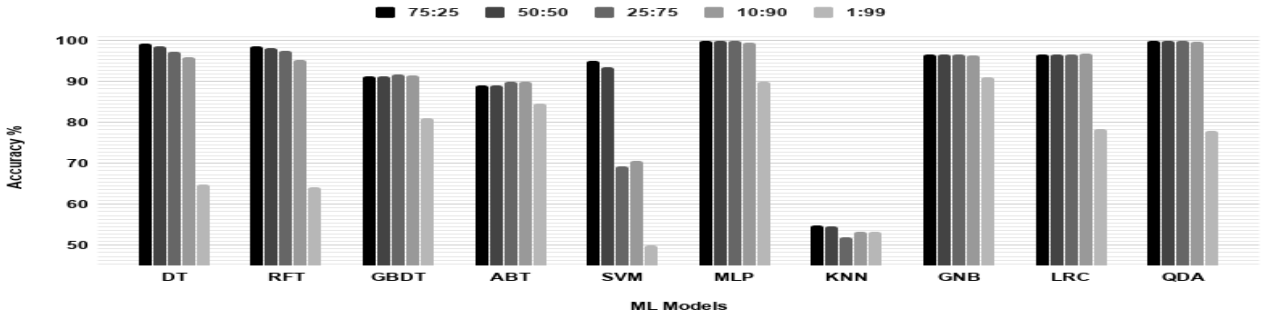

Fig. 19 ML Models performance for Directed Acyclic Graph (Fixed Size - OHE Encoding) and in respect to 5 ratios

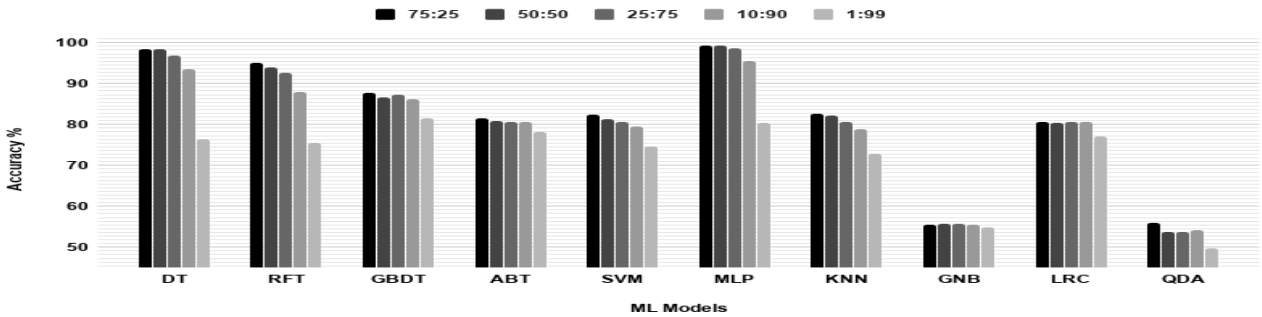

Fig. 20 ML Models performance for Disjoint Set (Fixed Size - OHE Encoding) and in respect to 5 ratios

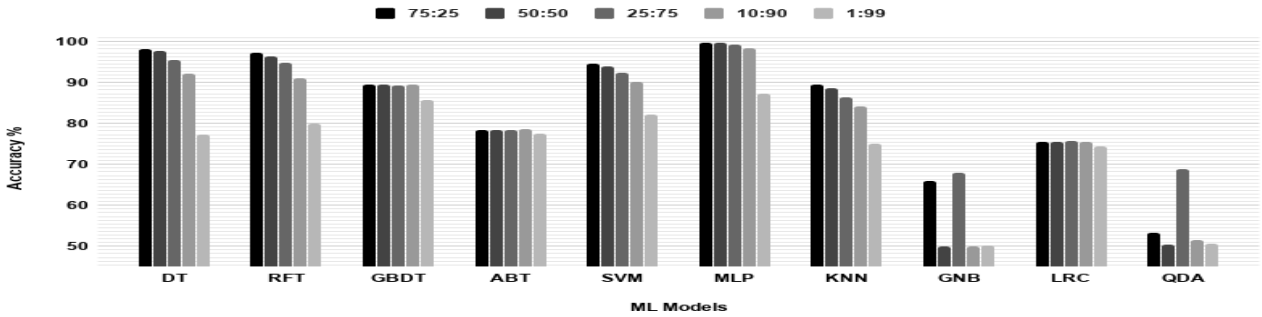

Fig. 21 ML Models performance for Fibonacci Heap (Fixed Size - OHE Encoding) and in respect to 5 ratios

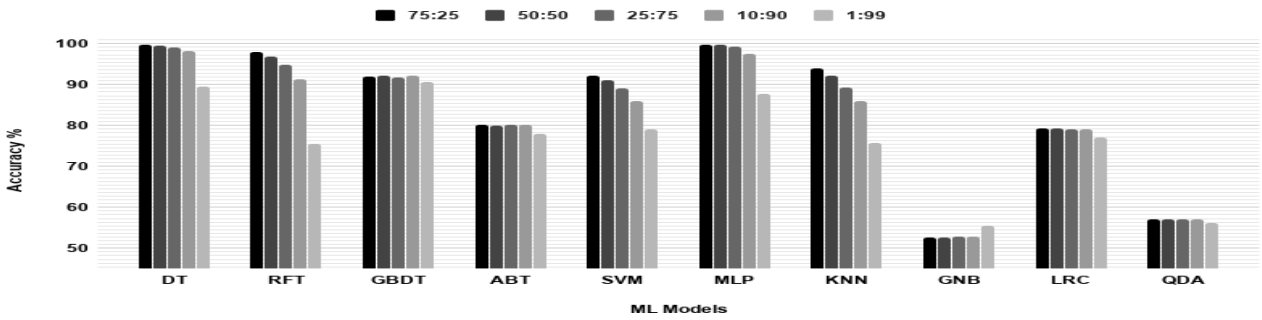

Fig. 22 ML Models performance for Heap Array (Fixed Size - OHE Encoding) and in respect to 5 ratios

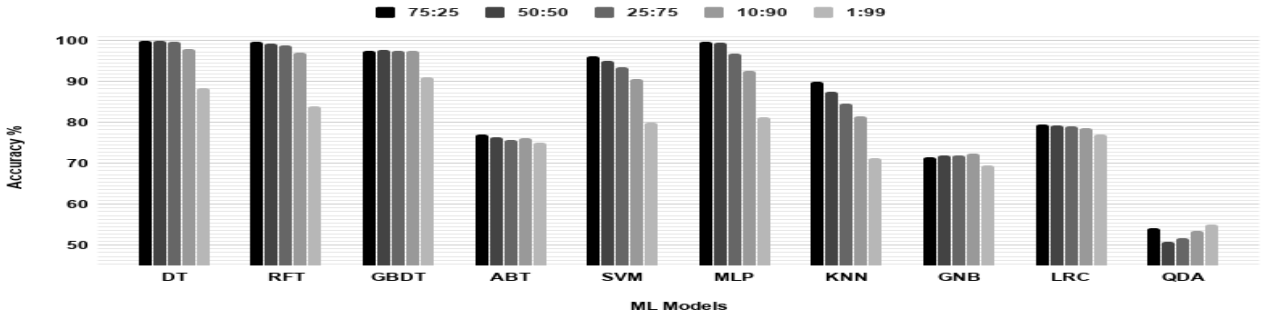

Fig. 23 ML Models performance for Red-Black Tree (Fixed Size - OHE Encoding) and in respect to 5 ratios

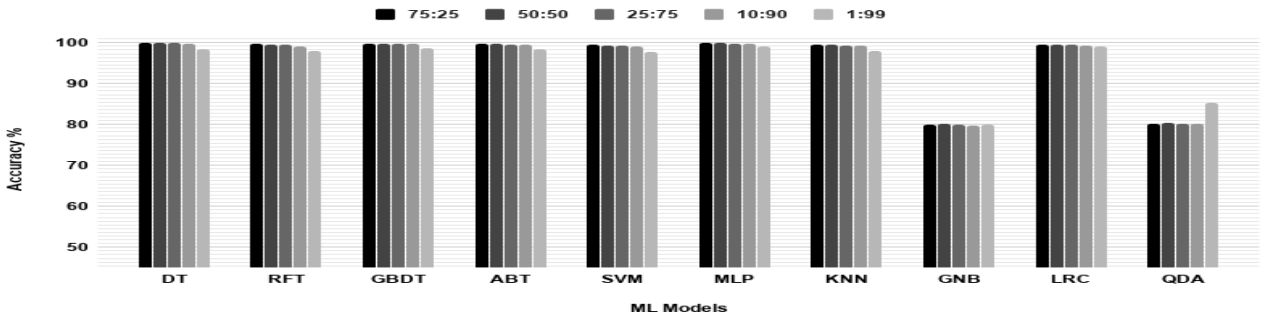

Fig. 24 ML Models performance for Sorted List (Fixed Size - OHE Encoding) and in respect to 5 ratios

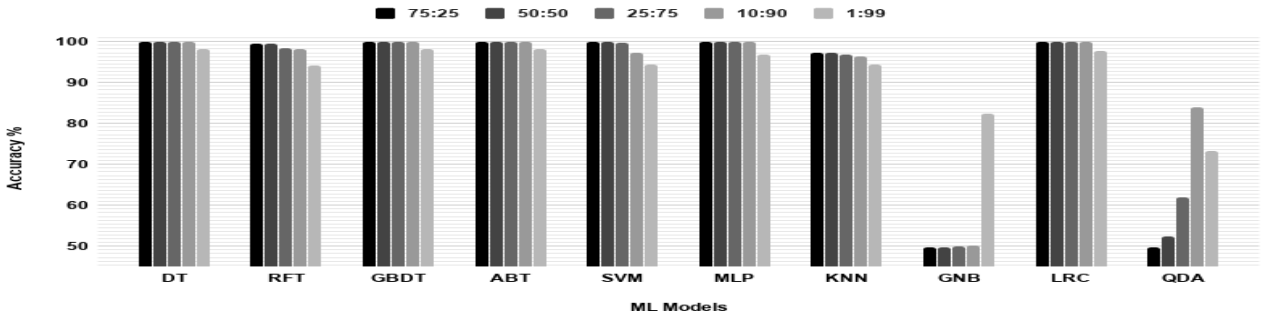

Fig. 25 ML Models performance for Singly Linked List (Fixed Size - OHE Encoding) and in respect to 5 ratios

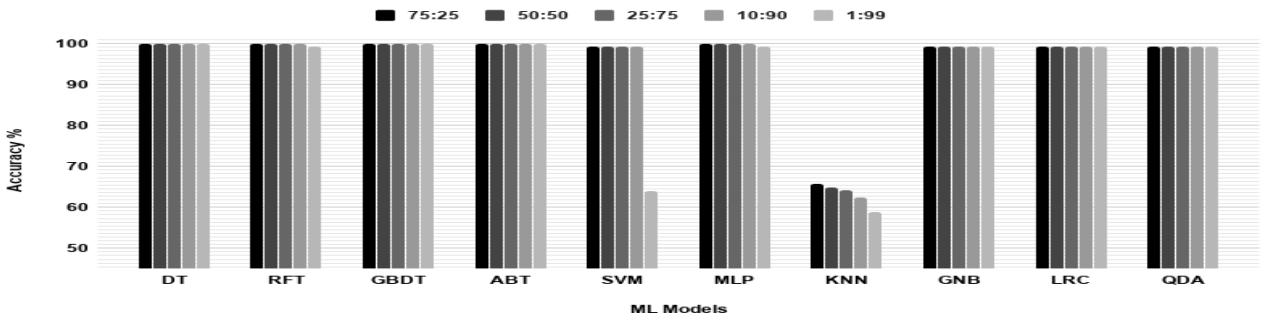

Fig. 26 ML Models performance for Binary Search Tree (Upto Size - OHE Encoding) and in respect to 5 ratios

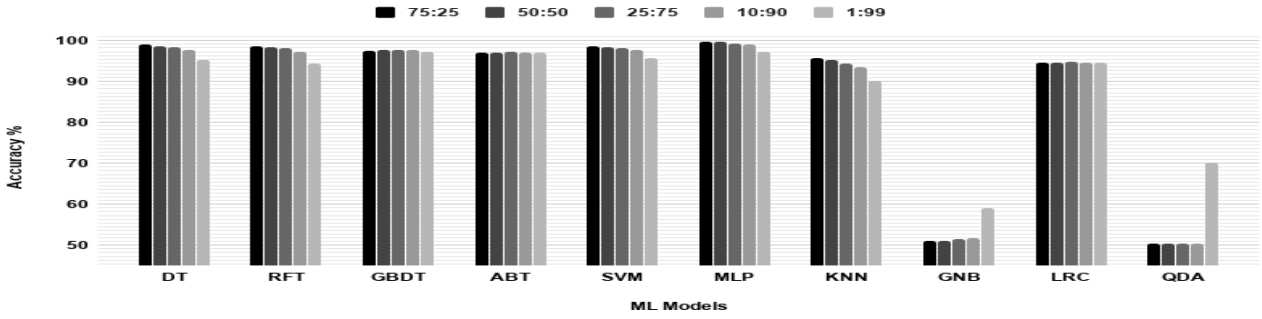

Fig. 27 ML Models performance for Binary Tree (Upto Size - OHE Encoding) and in respect to 5 ratios

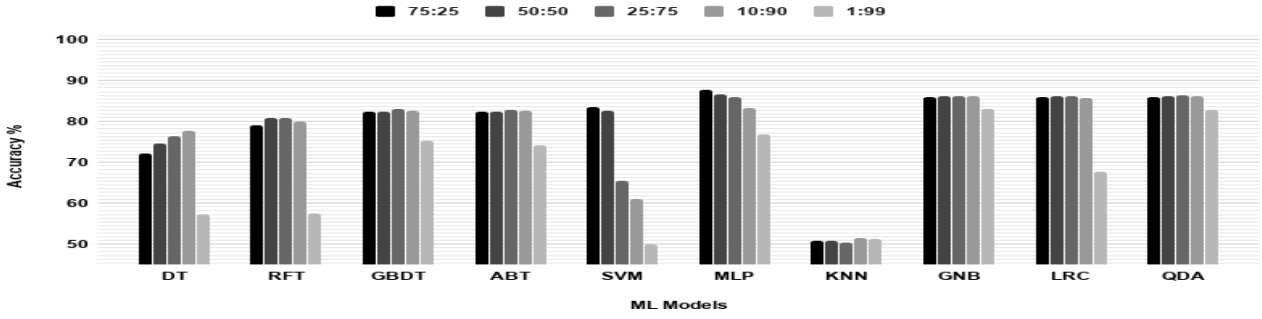

Fig. 28 ML Models performance for Red-Black Tree (Upto Size - OHE Encoding) and in respect to 5 ratios

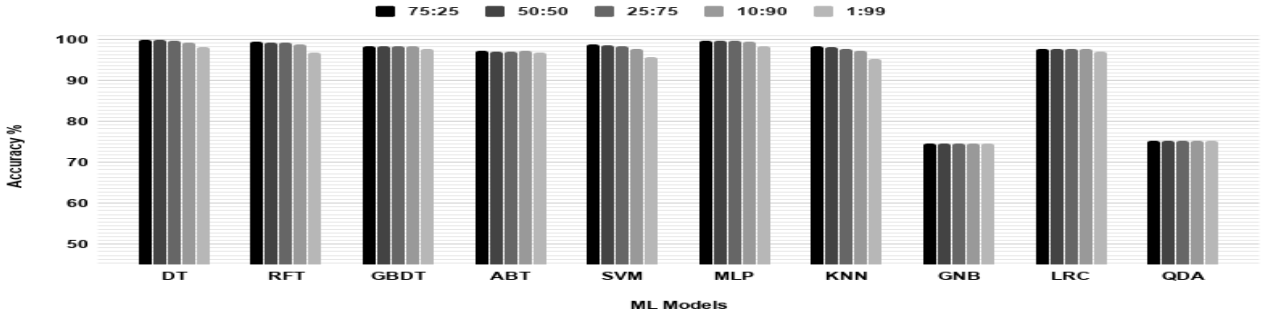

Fig. 29 ML Models performance for Sorted List (Upto Size - OHE Encoding) and in respect to 5 ratios

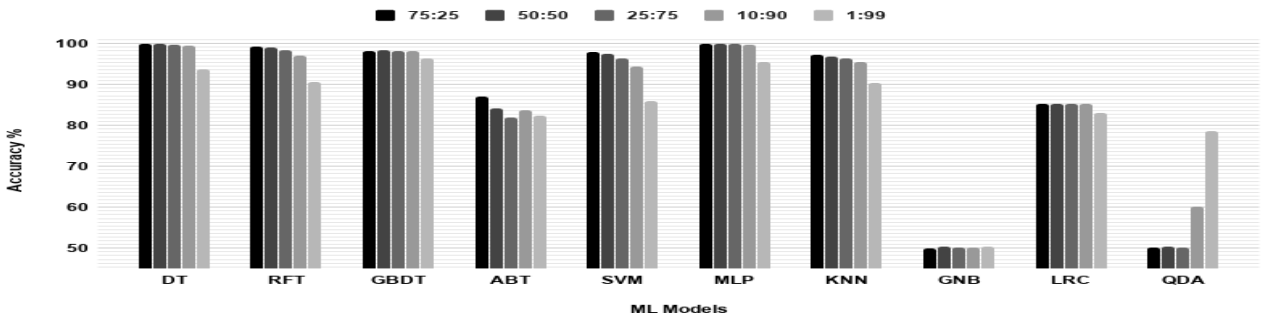

Fig. 30 ML Models performance for Singly Linked List (Upto Size - OHE Encoding) and in respect to 5 ratios

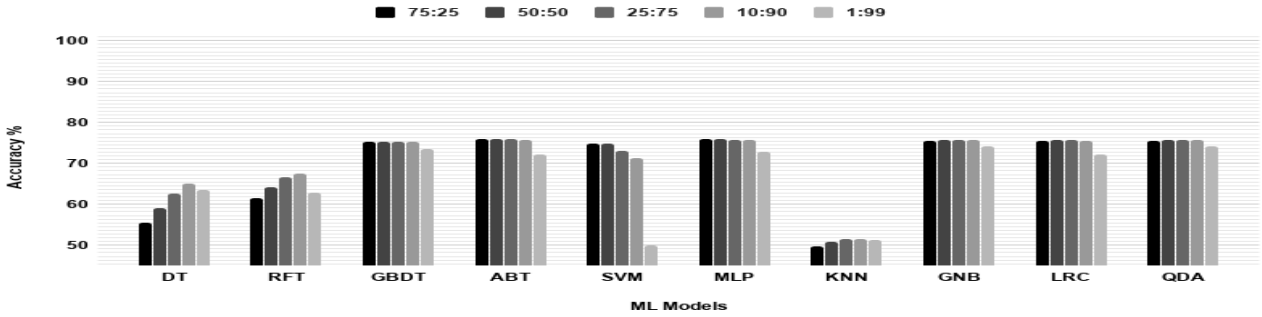

Fig. 31 ML Models performance for Binary Search Tree between all Datasets and in respect to 10:90 ratio

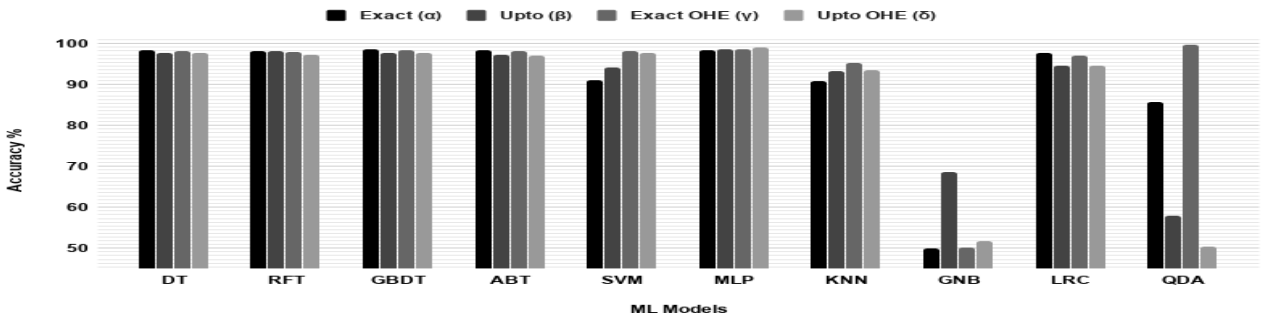

Fig. 32 ML Models performance for Binary Tree between all Datasets and in respect to 10:90 ratio

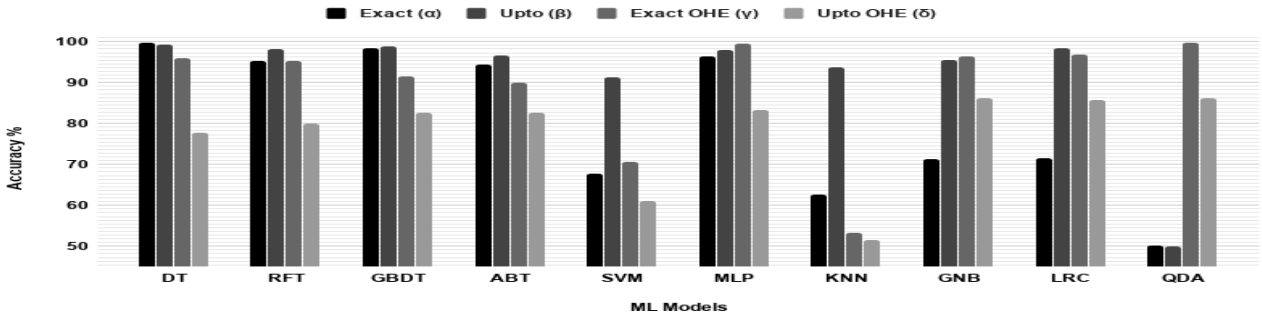

Fig. 33 ML Models performance for Red-Black Tree between all Datasets and in respect to 10:90 ratio

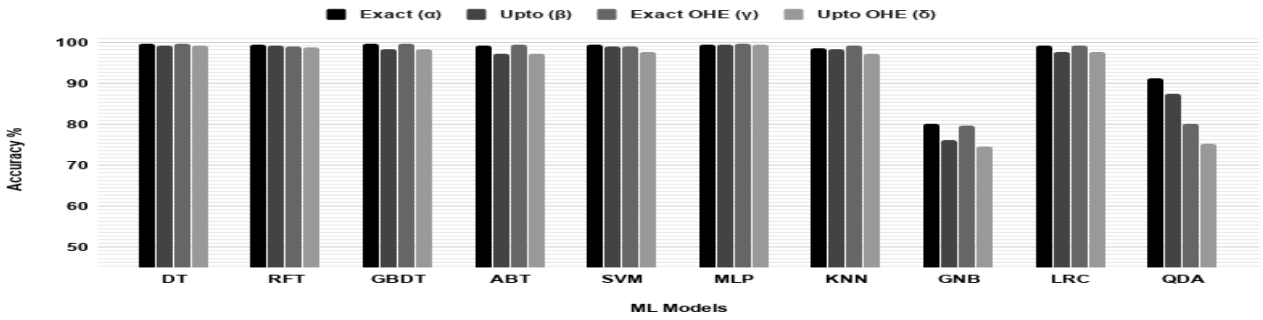

Fig. 34 ML Models performance for Sorted List between all Datasets and in respect to 10:90 ratio

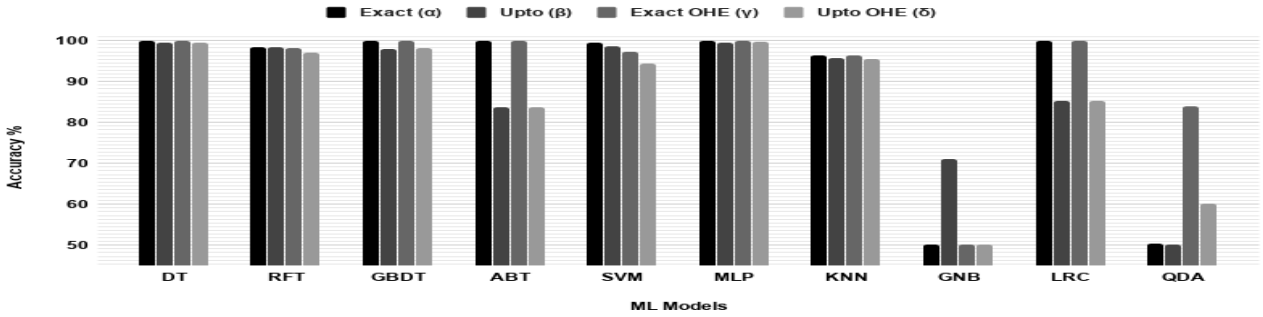

Fig. 35 ML Models performance for Singly Linked List between all Datasets and in respect to 10:90 ratio

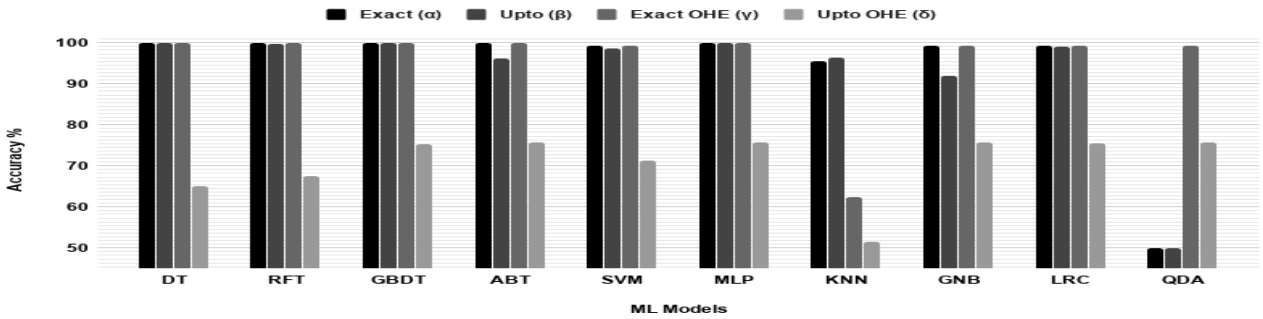

Table 1 ML Models performance for Binary Heap (Fixed Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	26,908	10	5	26,785	0.9997	0.9998	0.9996	0.9997
	RFT	26,903	15	15	26,775	0.9994	0.9994	0.9994	0.9994
	GBDT	26,824	94	264	26,526	0.9933	0.9903	0.9965	0.9934
	ABT	26,294	624	811	25,979	0.9733	0.9701	0.9768	0.9734
	SVM	26,877	41	75	26,715	0.9978	0.9972	0.9985	0.9978
75:25	MLP	26,917	1	4	26,786	0.9999	0.9999	1.0000	0.9999
	KNN	26,909	9	75	26,715	0.9984	0.9972	0.9997	0.9984
	GNB	26,918	0	2,920	23,870	0.9456	0.9021	1.0000	0.9486
	LRC	26,397	521	993	25,797	0.9718	0.9637	0.9806	0.9721
	QDA	26,909	9	2,620	24,170	0.9511	0.9113	0.9997	0.9534
	DT	53,896	22	25	53,473	0.9996	0.9995	0.9996	0.9996
	RFT	53,873	45	66	53,432	0.9990	0.9988	0.9992	0.9990
	GBDT	53,727	191	471	53,027	0.9938	0.9913	0.9965	0.9939
	ABT	52,749	1,169	1,582	51,916	0.9744	0.9709	0.9783	0.9746
	SVM	53,836	82	247	53,251	0.9969	0.9954	0.9985	0.9970
50:50	MLP	53,908	10	6	53,492	0.9999	0.9999	0.9998	0.9999
	KNN	53,876	42	311	53,187	0.9967	0.9943	0.9992	0.9967
	GNB	53,918	0	5,793	47,705	0.9461	0.9030	1.0000	0.9490
	LRC	52,843	1,075	2,009	51,489	0.9713	0.9634	0.9801	0.9716
	QDA	53,916	2	5,176	48,322	0.9518	0.9124	1.0000	0.9542
	DT	80,540	86	68	80,430	0.9990	0.9992	0.9989	0.9990
	RFT	80,499	127	170	80,328	0.9982	0.9979	0.9984	0.9982
	GBDT	80,361	265	636	79,862	0.9944	0.9921	0.9967	0.9944
	ABT	78,968	1,658	2,375	78,123	0.9750	0.9708	0.9794	0.9751
	SVM	80,508	118	829	79,669	0.9941	0.9898	0.9985	0.9942
25:75	MLP	80,613	13	20	80,478	0.9998	0.9998	0.9998	0.9998
	KNN	80,500	126	696	79,802	0.9949	0.9914	0.9984	0.9949
	GNB	80,626	0	8,805	71,693	0.9454	0.9015	1.0000	0.9482
	LRC	79,051	1,575	3,206	77,292	0.9703	0.9610	0.9805	0.9706
	QDA	76,818	3,808	6,649	73,849	0.9351	0.9203	0.9528	0.9363
	DT	96,504	187	136	96,522	0.9983	0.9986	0.9981	0.9983
	RFT	96,366	325	480	96,178	0.9958	0.9950	0.9966	0.9958
	GBDT	96,235	456	665	95,993	0.9942	0.9931	0.9953	0.9942
	ABT	94,750	1,941	3,179	93,479	0.9735	0.9675	0.9799	0.9737
	SVM	96,431	260	1,440	95,218	0.9912	0.9853	0.9973	0.9913
10:90	MLP	96,637	54	137	96,521	0.9990	0.9986	0.9994	0.9990
	KNN	96,434	257	1,283	95,375	0.9920	0.9869	0.9973	0.9921
	GNB	96,691	0	10,588	86,070	0.9452	0.9013	1.0000	0.9481
	LRC	94,520	2,171	3,756	92,902	0.9693	0.9618	0.9775	0.9696
	QDA	96,687	4	9,431	87,227	0.9512	0.9111	1.0000	0.9535
	DT	104,931	1,395	1,571	104,787	0.9861	0.9852	0.9869	0.9861
	RFT	105,129	1,197	1,956	104,402	0.9852	0.9817	0.9887	0.9852
	GBDT	105,556	770	1,579	104,779	0.9890	0.9853	0.9928	0.9890
	ABT	104,254	2,072	3,917	102,441	0.9718	0.9638	0.9805	0.9721
	SVM	105,359	967	4,464	101,894	0.9745	0.9594	0.9909	0.9749
1:99	MLP	105,584	742	924	105,434	0.9922	0.9913	0.9930	0.9922
	KNN	105,651	675	3,174	103,184	0.9819	0.9708	0.9937	0.9821
	GNB	106,326	0	11,901	94,457	0.9440	0.8993	1.0000	0.9470
	LRC	103,878	2,448	5,028	101,330	0.9648	0.9538	0.9770	0.9653
	QDA	106,318	8	10,438	95,920	0.9509	0.9106	0.9999	0.9532

Table 2 ML Models performance for Binary Search Tree (Fixed Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	4,147	13	36	4,202	0.9942	0.9914	0.9969	0.9941
	RBT	4,155	5	45	4,193	0.9940	0.9893	0.9988	0.9940
	GBDT	4,160	0	98	4,140	0.9883	0.9770	1.0000	0.9884
	ABT	4,150	10	94	4,144	0.9876	0.9779	0.9976	0.9876
	SVM	4,107	53	179	4,059	0.9724	0.9582	0.9873	0.9725
75:25	MLP	4,157	3	34	4,204	0.9956	0.9919	0.9993	0.9956
	KNN	4,139	21	399	3,839	0.9500	0.9121	0.9950	0.9517
	GNB	4,160	0	4,231	7	0.4962	0.4958	1.0000	0.6629
	LRC	4,160	0	166	4,072	0.9802	0.9616	1.0000	0.9804
	QDA	3,838	322	25	4,213	0.9587	0.9935	0.9226	0.9567
	DT	8,322	34	115	8,325	0.9911	0.9864	0.9959	0.9911
	RBT	8,345	11	102	8,338	0.9933	0.9879	0.9987	0.9933
	GBDT	8,355	1	228	8,212	0.9864	0.9734	0.9999	0.9865
	ABT	8,335	21	219	8,221	0.9857	0.9744	0.9975	0.9858
	SVM	8,144	212	395	8,045	0.9639	0.9537	0.9746	0.9641
50:50	MLP	8,343	13	103	8,337	0.9931	0.9878	0.9984	0.9931
	KNN	8,259	97	866	7,574	0.9427	0.9051	0.9884	0.9449
	GNB	8,356	0	8,421	19	0.4986	0.4981	1.0000	0.6649
	LRC	8,356	0	341	8,099	0.9797	0.9608	1.0000	0.9800
	QDA	2,760	5,596	17	8,423	0.6658	0.9939	0.3303	0.4958
	DT	12,475	77	187	12,455	0.9895	0.9852	0.9939	0.9895
	RBT	12,525	27	183	12,459	0.9917	0.9856	0.9978	0.9917
	GBDT	12,550	2	340	12,302	0.9864	0.9736	0.9998	0.9866
	ABT	12,526	26	310	12,332	0.9867	0.9758	0.9979	0.9868
	SVM	12,030	522	721	11,921	0.9507	0.9435	0.9584	0.9509
25:75	MLP	12,541	11	231	12,411	0.9904	0.9819	0.9991	0.9904
	KNN	12,271	281	1,496	11,146	0.9295	0.8913	0.9776	0.9325
	GNB	12,552	0	12,616	26	0.4992	0.4987	1.0000	0.6655
	LRC	12,552	0	509	12,133	0.9798	0.9610	1.0000	0.9801
	QDA	12,082	470	78	12,564	0.9782	0.9936	0.9626	0.9778
	DT	14,920	154	349	14,810	0.9834	0.9771	0.9898	0.9834
	RBT	14,891	183	362	14,797	0.9820	0.9763	0.9879	0.9820
	GBDT	15,058	16	435	14,724	0.9851	0.9719	0.9989	0.9852
	ABT	15,035	39	452	14,707	0.9838	0.9708	0.9974	0.9839
	SVM	14,566	508	2,218	12,941	0.9098	0.8679	0.9663	0.9144
10:90	MLP	15,034	40	442	14,717	0.9841	0.9714	0.9973	0.9842
	KNN	14,487	587	2,181	12,978	0.9084	0.8692	0.9611	0.9128
	GNB	15,074	0	15,130	29	0.4996	0.4991	1.0000	0.6658
	LRC	15,074	0	676	14,483	0.9776	0.9571	1.0000	0.9781
	QDA	10,833	4,241	67	15,092	0.8575	0.9939	0.7187	0.8341
	DT	15,265	1,370	910	15,712	0.9314	0.9437	0.9176	0.9305
	RBT	15,682	953	636	15,986	0.9522	0.9610	0.9427	0.9518
	GBDT	15,746	889	918	15,704	0.9457	0.9449	0.9466	0.9457
	ABT	15,863	772	857	15,765	0.9510	0.9487	0.9536	0.9512
	SVM	631	16,004	31	16,591	0.5178	0.9532	0.0379	0.0730
1:99	MLP	16,438	197	1,497	15,125	0.9491	0.9165	0.9882	0.9510
	KNN	14,785	1,850	2,619	14,003	0.8656	0.8495	0.8888	0.8687
	GNB	16,635	0	10,063	6,559	0.6974	0.6231	1.0000	0.7678
	LRC	16,622	13	1,072	15,550	0.9674	0.9394	0.9992	0.9684
	QDA	16,635	0	111	16,511	0.9967	0.9934	1.0000	0.9967

Table 3 ML Models performance for Binary Tree (Fixed Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	4,156	4	4	4,234	0.9990	0.9990	0.9990	0.9990
	RFT	4,125	35	33	4,205	0.9919	0.9921	0.9916	0.9918
	GBDT	4,094	66	93	4,145	0.9811	0.9778	0.9841	0.9810
	ABT	4,160	0	524	3,714	0.9376	0.8881	1.0000	0.9408
	SVM	3,478	682	1,170	3,068	0.7795	0.7483	0.8361	0.7897
75:25	MLP	4,154	6	36	4,202	0.9950	0.9914	0.9986	0.9950
	KNN	3,661	499	2,263	1,975	0.6711	0.6180	0.8800	0.7261
	GNB	4,160	0	2,477	1,761	0.7050	0.6268	1.0000	0.7706
	LRC	4,027	133	2,335	1,903	0.7061	0.6330	0.9680	0.7654
	QDA	0	4,160	0	4,238	0.5046	0.0000	0.0000	NaN
	DT	8,350	6	14	8,426	0.9988	0.9983	0.9993	0.9988
	RFT	8,303	53	77	8,363	0.9923	0.9908	0.9937	0.9922
	GBDT	8,232	124	183	8,257	0.9817	0.9783	0.9852	0.9817
	ABT	8,356	0	1,027	7,413	0.9389	0.8905	1.0000	0.9421
	SVM	6,569	1,787	2,355	6,085	0.7534	0.7361	0.7861	0.7603
50:50	MLP	8,305	51	72	8,368	0.9927	0.9914	0.9939	0.9926
	KNN	7,175	1,181	4,422	4,018	0.6664	0.6187	0.8587	0.7192
	GNB	8,356	0	4,874	3,566	0.7098	0.6316	1.0000	0.7742
	LRC	8,065	291	4,613	3,827	0.7080	0.6361	0.9652	0.7669
	QDA	0	8,356	0	8,440	0.5025	0.0000	0.0000	NaN
	DT	12,547	5	35	12,607	0.9984	0.9972	0.9996	0.9984
	RFT	12,349	203	156	12,486	0.9858	0.9875	0.9838	0.9857
	GBDT	12,384	168	242	12,400	0.9837	0.9808	0.9866	0.9837
	ABT	12,425	127	1,432	11,210	0.9381	0.8967	0.9899	0.9410
	SVM	9,076	3,476	3,727	8,915	0.7141	0.7089	0.7231	0.7159
25:75	MLP	12,483	69	294	12,348	0.9856	0.9770	0.9945	0.9857
	KNN	10,515	2,037	6,781	5,861	0.6500	0.6079	0.8377	0.7046
	GNB	12,552	0	7,254	5,388	0.7121	0.6337	1.0000	0.7758
	LRC	12,150	402	6,919	5,723	0.7094	0.6372	0.9680	0.7685
	QDA	0	12,552	0	12,642	0.5018	0.0000	0.0000	NaN
	DT	15,074	0	96	15,063	0.9968	0.9937	1.0000	0.9968
	RFT	14,343	731	716	14,443	0.9521	0.9525	0.9515	0.9520
	GBDT	14,880	194	261	14,898	0.9850	0.9828	0.9871	0.9849
	ABT	15,074	0	1,702	13,457	0.9437	0.8985	1.0000	0.9466
	SVM	10,096	4,978	4,783	10,376	0.6771	0.6785	0.6698	0.6741
10:90	MLP	14,705	369	715	14,444	0.9641	0.9536	0.9755	0.9645
	KNN	12,097	2,977	8,352	6,807	0.6253	0.5916	0.8025	0.6811
	GNB	15,074	0	8,692	6,467	0.7125	0.6343	1.0000	0.7762
	LRC	13,698	1,376	7,212	7,947	0.7159	0.6551	0.9087	0.7613
	QDA	0	15,074	0	15,159	0.5014	0.0000	0.0000	NaN
	DT	16,427	208	704	15,918	0.9726	0.9589	0.9875	0.9730
	RFT	12,757	3,878	2,987	13,635	0.7936	0.8103	0.7669	0.7880
	GBDT	15,993	642	874	15,748	0.9544	0.9482	0.9614	0.9547
	ABT	15,674	961	1,925	14,697	0.9132	0.8906	0.9422	0.9157
	SVM	2,194	14,441	894	15,728	0.5389	0.7105	0.1319	0.2225
1:99	MLP	11,964	4,671	4,866	11,756	0.7132	0.7109	0.7192	0.7150
	KNN	10,563	6,072	7,873	8,749	0.5807	0.5730	0.6350	0.6024
	GNB	16,635	0	9,537	7,085	0.7132	0.6356	1.0000	0.7772
	LRC	11,903	4,732	5,688	10,934	0.6867	0.6767	0.7155	0.6956
	QDA	0	16,635	0	16,622	0.4998	0.0000	0.0000	NaN

Table 4 ML Models performance for Directed Acyclic Graph (Fixed Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	4,896	28	61	4,863	0.9910	0.9877	0.9943	0.9910
	RFT	4,802	122	312	4,612	0.9559	0.9390	0.9752	0.9568
	GBDT	4,389	535	628	4,296	0.8819	0.8748	0.8913	0.8830
	ABT	4,042	882	869	4,055	0.8222	0.8231	0.8209	0.8220
	SVM	4,624	300	820	4,104	0.8863	0.8494	0.9391	0.8920
75:25	MLP	4,910	14	271	4,653	0.9711	0.9477	0.9972	0.9718
	KNN	4,848	76	1,053	3,871	0.8854	0.8216	0.9846	0.8957
	GNB	4,880	44	4,426	498	0.5461	0.5244	0.9911	0.6859
	LRC	3,859	1,065	1,044	3,880	0.7858	0.7871	0.7837	0.7854
	QDA	4,135	789	3,035	1,889	0.6117	0.5767	0.8398	0.6838
	DT	9,769	113	221	9,593	0.9830	0.9779	0.9886	0.9832
	RFT	9,480	402	690	9,124	0.9446	0.9322	0.9593	0.9455
	GBDT	8,797	1,085	1,288	8,526	0.8795	0.8723	0.8902	0.8812
	ABT	8,130	1,752	1,739	8,075	0.8228	0.8238	0.8227	0.8232
	SVM	9,164	718	1,666	8,148	0.8790	0.8462	0.9273	0.8849
50:50	MLP	9,787	95	663	9,151	0.9615	0.9366	0.9904	0.9627
	KNN	9,621	261	2,129	7,685	0.8787	0.8188	0.9736	0.8895
	GNB	9,791	91	8,769	1,045	0.5502	0.5275	0.9908	0.6885
	LRC	7,762	2,120	2,104	7,710	0.7855	0.7867	0.7855	0.7861
	QDA	8,261	1,621	4,562	5,252	0.6861	0.6442	0.8360	0.7277
	DT	14,461	348	598	14,137	0.9680	0.9603	0.9765	0.9683
	RFT	13,896	913	1,229	13,506	0.9275	0.9187	0.9383	0.9284
	GBDT	13,185	1,624	2,014	12,721	0.8769	0.8675	0.8903	0.8788
	ABT	11,922	2,887	2,584	12,151	0.8148	0.8219	0.8051	0.8134
	SVM	13,394	1,415	2,588	12,147	0.8645	0.8381	0.9044	0.8700
25:75	MLP	14,376	433	1,563	13,172	0.9324	0.9019	0.9708	0.9351
	KNN	14,167	642	3,429	11,306	0.8622	0.8051	0.9566	0.8744
	GNB	14,694	115	13,304	1,431	0.5458	0.5248	0.9922	0.6865
	LRC	11,589	3,220	3,138	11,597	0.7848	0.7869	0.7826	0.7847
	QDA	14,626	183	13,761	974	0.5280	0.5152	0.9876	0.6772
	DT	17,100	612	1,215	16,526	0.9485	0.9337	0.9654	0.9493
	RFT	15,837	1,875	1,890	15,851	0.8938	0.8934	0.8941	0.8938
	GBDT	15,559	2,153	2,483	15,258	0.8692	0.8624	0.8784	0.8703
	ABT	14,389	3,323	3,211	14,530	0.8157	0.8176	0.8124	0.8150
	SVM	15,536	2,176	3,191	14,550	0.8486	0.8296	0.8771	0.8527
10:90	MLP	16,117	1,595	2,128	15,613	0.8950	0.8834	0.9099	0.8965
	KNN	16,549	1,163	4,575	13,166	0.8382	0.7834	0.9343	0.8523
	GNB	17,254	458	14,538	3,203	0.5770	0.5427	0.9741	0.6971
	LRC	13,879	3,833	3,767	13,974	0.7856	0.7865	0.7836	0.7851
	QDA	15,810	1,902	9,294	8,447	0.6842	0.6298	0.8926	0.7385
	DT	16,127	3,387	3,968	15,517	0.8114	0.8025	0.8264	0.8143
	RFT	12,673	6,841	2,826	16,659	0.7521	0.8177	0.6494	0.7239
	GBDT	16,512	3,002	3,125	16,360	0.8429	0.8409	0.8462	0.8435
	ABT	15,131	4,383	3,483	16,002	0.7983	0.8129	0.7754	0.7937
	SVM	15,488	4,026	3,680	15,805	0.8024	0.8080	0.7937	0.8008
1:99	MLP	14,805	4,709	3,309	16,176	0.7944	0.8173	0.7587	0.7869
	KNN	16,325	3,189	5,444	14,041	0.7786	0.7499	0.8366	0.7909
	GNB	15,998	3,516	7,252	12,233	0.7239	0.6881	0.8198	0.7482
	LRC	14,457	5,057	3,976	15,509	0.7684	0.7843	0.7409	0.7620
	QDA	8,785	10,729	4,925	14,560	0.5986	0.6408	0.4502	0.5288

Table 5 ML Models performance for Disjoint Set (Fixed Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	10,290	93	210	10,180	0.9854	0.9800	0.9910	0.9855
	RFT	10,291	92	378	10,012	0.9774	0.9646	0.9911	0.9777
	GBDT	9,675	708	1,579	8,811	0.8899	0.8597	0.9318	0.8943
	ABT	8,027	2,356	2,095	8,295	0.7857	0.7930	0.7731	0.7829
	SVM	10,210	173	1,350	9,040	0.9267	0.8832	0.9833	0.9306
75:25	MLP	10,362	21	242	10,148	0.9873	0.9772	0.9980	0.9875
	KNN	10,299	84	2,249	8,141	0.8877	0.8208	0.9919	0.8983
	GNB	8,720	1,663	4,748	5,642	0.6914	0.6475	0.8398	0.7312
	LRC	7,542	2,841	3,022	7,368	0.7178	0.7139	0.7264	0.7201
	QDA	83	10,300	102	10,288	0.4993	0.4486	0.0080	0.0157
	DT	20,347	427	690	20,082	0.9731	0.9672	0.9794	0.9733
	RFT	20,479	295	991	19,781	0.9690	0.9538	0.9858	0.9696
	GBDT	19,467	1,307	3,013	17,759	0.8960	0.8660	0.9371	0.9001
	ABT	16,142	4,632	4,122	16,650	0.7893	0.7966	0.7770	0.7867
	SVM	20,303	471	2,852	17,920	0.9200	0.8768	0.9773	0.9244
50:50	MLP	20,707	67	708	20,064	0.9813	0.9669	0.9968	0.9816
	KNN	20,403	371	4,761	16,011	0.8765	0.8108	0.9821	0.8883
	GNB	4	20,770	13	20,759	0.4998	0.2353	0.0002	0.0004
	LRC	15,216	5,558	6,031	14,741	0.7211	0.7161	0.7325	0.7242
	QDA	20,774	0	20,772	0	0.5000	0.5000	1.0000	0.6667
	DT	29,843	1,362	1,870	29,244	0.9481	0.9410	0.9564	0.9486
	RFT	30,168	1,037	2,284	28,830	0.9467	0.9296	0.9668	0.9478
	GBDT	29,060	2,145	4,593	26,521	0.8919	0.8635	0.9313	0.8961
	ABT	24,179	7,026	6,186	24,928	0.7880	0.7963	0.7748	0.7854
	SVM	30,004	1,201	4,846	26,268	0.9030	0.8609	0.9615	0.9085
25:75	MLP	30,621	584	1,909	29,205	0.9600	0.9413	0.9813	0.9609
	KNN	29,952	1,253	7,782	23,332	0.8550	0.7938	0.9598	0.8689
	GNB	18,093	13,112	6,368	24,746	0.6874	0.7397	0.5798	0.6501
	LRC	22,962	8,243	9,164	21,950	0.7207	0.7147	0.7358	0.7251
	QDA	6,127	25,078	5,821	25,293	0.5042	0.5128	0.1963	0.2840
	DT	34,700	2,788	3,394	33,901	0.9173	0.9109	0.9256	0.9182
	RFT	34,897	2,591	3,458	33,837	0.9191	0.9098	0.9309	0.9202
	GBDT	34,846	2,642	5,411	31,884	0.8923	0.8656	0.9295	0.8964
	ABT	28,787	8,701	7,261	30,034	0.7866	0.7986	0.7679	0.7829
	SVM	35,064	2,424	6,510	30,785	0.8805	0.8434	0.9353	0.8870
10:90	MLP	34,641	2,847	3,595	33,700	0.9139	0.9060	0.9241	0.9149
	KNN	34,343	3,145	9,685	27,610	0.8284	0.7800	0.9161	0.8426
	GNB	9	37,479	17	37,278	0.4986	0.3462	0.0002	0.0005
	LRC	27,007	10,481	10,536	26,759	0.7190	0.7194	0.7204	0.7199
	QDA	9	37,479	17	37,278	0.4986	0.3462	0.0002	0.0005
	DT	31,496	9,642	8,342	32,782	0.7814	0.7906	0.7656	0.7779
	RFT	32,840	8,298	6,965	34,159	0.8145	0.8250	0.7983	0.8114
	GBDT	36,161	4,977	7,228	33,896	0.8516	0.8334	0.8790	0.8556
	ABT	31,063	10,075	8,191	32,933	0.7780	0.7913	0.7551	0.7728
	SVM	35,840	5,298	10,245	30,879	0.8111	0.7777	0.8712	0.8218
1:99	MLP	33,100	8,038	8,387	32,737	0.8003	0.7978	0.8046	0.8012
	KNN	32,739	8,399	13,216	27,908	0.7372	0.7124	0.7958	0.7518
	GNB	10	41,128	17	41,107	0.4998	0.3704	0.0002	0.0005
	LRC	29,497	11,641	11,613	29,511	0.7173	0.7175	0.7170	0.7173
	QDA	10	41,128	17	41,107	0.4998	0.3704	0.0002	0.0005

Table 6 ML Models performance for Fibonacci Heap (Fixed Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	13,021	32	54	13,034	0.9967	0.9959	0.9975	0.9967
	RFT	12,855	198	216	12,872	0.9842	0.9835	0.9848	0.9842
	GBDT	12,223	830	1,379	11,709	0.9155	0.8986	0.9364	0.9171
	ABT	10,663	2,390	2,725	10,363	0.8043	0.7965	0.8169	0.8066
	SVM	12,852	201	670	12,418	0.9667	0.9505	0.9846	0.9672
75:25	MLP	13,030	23	45	13,043	0.9974	0.9966	0.9982	0.9974
	KNN	12,928	125	1,482	11,606	0.9385	0.8972	0.9904	0.9415
	GNB	13,039	14	11,520	1,568	0.5588	0.5309	0.9989	0.6933
	LRC	10,609	2,444	3,061	10,027	0.7894	0.7761	0.8128	0.7940
	QDA	12,995	58	10,967	2,121	0.5782	0.5423	0.9956	0.7021
	DT	26,032	90	138	26,021	0.9956	0.9947	0.9966	0.9956
	RFT	25,545	577	483	25,676	0.9797	0.9814	0.9779	0.9797
	GBDT	24,547	1,575	2,631	23,528	0.9196	0.9032	0.9397	0.9211
	ABT	21,279	4,843	5,574	20,585	0.8007	0.7924	0.8146	0.8034
	SVM	25,609	513	1,686	24,473	0.9579	0.9382	0.9804	0.9588
50:50	MLP	26,038	84	102	26,057	0.9964	0.9961	0.9968	0.9964
	KNN	25,593	529	3,608	22,551	0.9209	0.8764	0.9797	0.9252
	GNB	26,099	23	23,032	3,127	0.5590	0.5312	0.9991	0.6936
	LRC	21,214	4,908	6,125	20,034	0.7890	0.7760	0.8121	0.7936
	QDA	26,107	15	22,508	3,651	0.5692	0.5370	0.9994	0.6986
	DT	38,914	355	370	38,783	0.9908	0.9906	0.9910	0.9908
	RFT	37,710	1,559	1,349	37,804	0.9629	0.9655	0.9603	0.9629
	GBDT	36,885	2,384	3,845	35,308	0.9206	0.9056	0.9393	0.9221
	ABT	31,823	7,446	8,147	31,006	0.8012	0.7962	0.8104	0.8032
	SVM	38,071	1,198	3,661	35,492	0.9380	0.9123	0.9695	0.9400
25:75	MLP	38,968	301	338	38,815	0.9919	0.9914	0.9923	0.9919
	KNN	37,507	1,762	6,758	32,395	0.8914	0.8473	0.9551	0.8980
	GNB	39,232	37	34,474	4,679	0.5599	0.5323	0.9991	0.6945
	LRC	31,763	7,506	9,151	30,002	0.7876	0.7763	0.8089	0.7923
	QDA	39,237	32	33,494	5,659	0.5725	0.5395	0.9992	0.7007
	DT	46,237	913	1,049	45,907	0.9792	0.9778	0.9806	0.9792
	RFT	43,699	3,451	2,732	44,224	0.9343	0.9412	0.9268	0.9339
	GBDT	44,345	2,805	4,691	42,265	0.9203	0.9043	0.9405	0.9221
	ABT	37,998	9,152	9,637	37,319	0.8003	0.7977	0.8059	0.8018
	SVM	44,882	2,268	6,014	40,942	0.9120	0.8818	0.9519	0.9155
10:90	MLP	46,292	858	884	46,072	0.9815	0.9813	0.9818	0.9815
	KNN	43,574	3,576	9,967	36,989	0.8561	0.8138	0.9242	0.8655
	GNB	47,105	45	41,335	5,621	0.5603	0.5326	0.9990	0.6948
	LRC	37,804	9,346	10,708	36,248	0.7869	0.7793	0.8018	0.7904
	QDA	47,107	43	40,392	6,564	0.5703	0.5384	0.9991	0.6997
	DT	46,319	5,444	7,240	44,514	0.8775	0.8648	0.8948	0.8796
	RFT	40,928	10,835	8,446	43,308	0.8137	0.8289	0.7907	0.8094
	GBDT	47,875	3,888	6,720	45,034	0.8975	0.8769	0.9249	0.9003
	ABT	41,175	10,588	12,433	39,321	0.7776	0.7681	0.7955	0.7815
	SVM	44,460	7,303	11,920	39,834	0.8143	0.7886	0.8589	0.8222
1:99	MLP	44,674	7,089	6,829	44,925	0.8655	0.8674	0.8630	0.8652
	KNN	40,306	11,457	17,360	34,394	0.7216	0.6990	0.7787	0.7367
	GNB	51,713	50	45,558	6,196	0.5594	0.5316	0.9990	0.6940
	LRC	41,109	10,654	13,073	38,681	0.7708	0.7587	0.7942	0.7760
	QDA	51,757	6	44,534	7,220	0.5697	0.5375	0.9999	0.6992

Table 7 ML Models performance for Heap Array (Fixed Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	3,273	0	7	3,290	0.9989	0.9979	1.0000	0.9989
	RFT	3,268	5	15	3,282	0.9970	0.9954	0.9985	0.9969
	GBDT	3,273	0	158	3,139	0.9760	0.9539	1.0000	0.9764
	ABT	2,601	672	831	2,466	0.7712	0.7579	0.7947	0.7758
	SVM	3,263	10	244	3,053	0.9613	0.9304	0.9969	0.9625
75:25	MLP	3,269	4	13	3,284	0.9974	0.9960	0.9988	0.9974
	KNN	3,262	11	655	2,642	0.8986	0.8328	0.9966	0.9074
	GNB	2,670	603	1,263	2,034	0.7160	0.6789	0.8158	0.7410
	LRC	2,783	490	858	2,439	0.7948	0.7644	0.8503	0.8050
	QDA	413	2,860	157	3,140	0.5408	0.7246	0.1262	0.2149
	DT	6,532	1	8	6,598	0.9993	0.9988	0.9998	0.9993
	RFT	6,492	41	54	6,552	0.9928	0.9918	0.9937	0.9927
	GBDT	6,531	2	295	6,311	0.9774	0.9568	0.9997	0.9778
	ABT	5,125	1,408	1,692	4,914	0.7641	0.7518	0.7845	0.7678
	SVM	6,506	27	619	5,987	0.9508	0.9131	0.9959	0.9527
50:50	MLP	6,527	6	64	6,542	0.9947	0.9903	0.9991	0.9947
	KNN	6,445	88	1,564	5,042	0.8743	0.8047	0.9865	0.8864
	GNB	5,302	1,231	2,459	4,147	0.7192	0.6832	0.8116	0.7418
	LRC	5,510	1,023	1,690	4,916	0.7935	0.7653	0.8434	0.8024
	QDA	6,081	452	6,019	587	0.5075	0.5026	0.9308	0.6527
	DT	9,777	28	32	9,872	0.9970	0.9967	0.9971	0.9969
	RFT	9,681	124	120	9,784	0.9876	0.9878	0.9874	0.9876
	GBDT	9,804	1	476	9,428	0.9758	0.9537	0.9999	0.9763
	ABT	7,563	2,242	2,526	7,378	0.7581	0.7496	0.7713	0.7603
	SVM	9,685	120	1,174	8,730	0.9343	0.8919	0.9878	0.9374
25:75	MLP	9,754	51	579	9,325	0.9680	0.9440	0.9948	0.9687
	KNN	9,530	275	2,739	7,165	0.8471	0.7768	0.9720	0.8635
	GNB	7,921	1,884	3,664	6,240	0.7185	0.6837	0.8079	0.7406
	LRC	8,210	1,595	2,537	7,367	0.7903	0.7639	0.8373	0.7989
	QDA	1,202	8,603	926	8,978	0.5165	0.5648	0.1226	0.2015
	DT	11,558	259	240	11,594	0.9789	0.9797	0.9781	0.9789
	RFT	11,427	390	284	11,550	0.9715	0.9757	0.9670	0.9714
	GBDT	11,791	26	570	11,264	0.9748	0.9539	0.9978	0.9753
	ABT	9,150	2,667	2,991	8,843	0.7608	0.7536	0.7743	0.7638
	SVM	11,410	407	1,806	10,028	0.9064	0.8633	0.9656	0.9116
10:90	MLP	11,457	360	1,408	10,426	0.9252	0.8906	0.9695	0.9284
	KNN	11,217	600	3,760	8,074	0.8157	0.7489	0.9492	0.8373
	GNB	9,563	2,254	4,256	7,578	0.7247	0.6920	0.8093	0.7461
	LRC	9,809	2,008	3,028	8,806	0.7871	0.7641	0.8301	0.7957
	QDA	10,982	835	10,181	1,653	0.5342	0.5189	0.9293	0.6660
	DT	11,614	1,390	1,645	11,367	0.8833	0.8759	0.8931	0.8844
	RFT	10,709	2,295	1,902	11,110	0.8387	0.8492	0.8235	0.8362
	GBDT	12,024	980	1,351	11,661	0.9104	0.8990	0.9246	0.9116
	ABT	10,140	2,864	3,648	9,364	0.7497	0.7354	0.7798	0.7569
	SVM	10,905	2,099	3,134	9,878	0.7989	0.7768	0.8386	0.8065
1:99	MLP	11,241	1,763	3,112	9,900	0.8126	0.7832	0.8644	0.8218
	KNN	10,806	2,198	5,249	7,763	0.7138	0.6731	0.8310	0.7437
	GNB	9,873	3,131	4,812	8,200	0.6947	0.6723	0.7592	0.7131
	LRC	10,495	2,509	3,459	9,553	0.7706	0.7521	0.8071	0.7786
	QDA	5,956	7,048	4,632	8,380	0.5510	0.5625	0.4580	0.5049

Table 8 ML Models performance for Red-Black Tree (Fixed Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	4,288	0	6	4,286	0.9993	0.9986	1.0000	0.9993
	RFT	4,288	0	17	4,275	0.9980	0.9961	1.0000	0.9980
	GBDT	4,288	0	20	4,272	0.9977	0.9954	1.0000	0.9977
	ABT	4,288	0	35	4,257	0.9959	0.9919	1.0000	0.9959
	SVM	4,288	0	27	4,265	0.9969	0.9937	1.0000	0.9969
75:25	MLP	4,288	0	12	4,280	0.9986	0.9972	1.0000	0.9986
	KNN	4,288	0	42	4,250	0.9951	0.9903	1.0000	0.9951
	GNB	4,226	62	1,621	2,671	0.8038	0.7228	0.9855	0.8339
	LRC	4,285	3	47	4,245	0.9942	0.9892	0.9993	0.9942
	QDA	2,388	1,900	28	4,264	0.7753	0.9884	0.5569	0.7124
	DT	8,573	0	19	8,568	0.9989	0.9978	1.0000	0.9989
	RFT	8,573	0	38	8,549	0.9978	0.9956	1.0000	0.9978
	GBDT	8,573	0	37	8,550	0.9978	0.9957	1.0000	0.9978
	ABT	8,573	0	71	8,516	0.9959	0.9918	1.0000	0.9959
	SVM	8,573	0	64	8,523	0.9963	0.9926	1.0000	0.9963
50:50	MLP	8,573	0	36	8,551	0.9979	0.9958	1.0000	0.9979
	KNN	8,573	0	104	8,483	0.9939	0.9880	1.0000	0.9940
	GNB	8,478	95	3,224	5,363	0.8066	0.7245	0.9889	0.8363
	LRC	8,566	7	92	8,495	0.9942	0.9894	0.9992	0.9943
	QDA	8,569	4	231	8,356	0.9863	0.9738	0.9995	0.9865
	DT	12,843	18	31	12,848	0.9981	0.9976	0.9986	0.9981
	RFT	12,860	1	76	12,803	0.9970	0.9941	0.9999	0.9970
	GBDT	12,861	0	63	12,816	0.9976	0.9951	1.0000	0.9976
	ABT	12,861	0	128	12,751	0.9950	0.9901	1.0000	0.9950
	SVM	12,861	0	127	12,752	0.9951	0.9902	1.0000	0.9951
25:75	MLP	12,855	6	66	12,813	0.9972	0.9949	0.9995	0.9972
	KNN	12,861	0	223	12,656	0.9913	0.9830	1.0000	0.9914
	GNB	12,757	104	4,894	7,985	0.8058	0.7227	0.9919	0.8362
	LRC	12,854	7	157	12,722	0.9936	0.9879	0.9995	0.9937
	QDA	12,858	3	594	12,285	0.9768	0.9558	0.9998	0.9773
	DT	15,417	4	64	15,403	0.9978	0.9959	0.9997	0.9978
	RFT	15,418	3	137	15,330	0.9955	0.9912	0.9998	0.9955
	GBDT	15,421	0	89	15,378	0.9971	0.9943	1.0000	0.9971
	ABT	15,379	42	157	15,310	0.9936	0.9899	0.9973	0.9936
	SVM	15,421	0	171	15,296	0.9945	0.9890	1.0000	0.9945
10:90	MLP	15,420	1	120	15,347	0.9961	0.9923	0.9999	0.9961
	KNN	15,421	0	442	15,025	0.9857	0.9721	1.0000	0.9859
	GNB	15,238	183	5,925	9,542	0.8023	0.7200	0.9881	0.8330
	LRC	15,409	12	208	15,259	0.9929	0.9867	0.9992	0.9929
	QDA	13,011	2,410	280	15,187	0.9129	0.9789	0.8437	0.9063
	DT	16,822	176	279	16,700	0.9866	0.9837	0.9896	0.9867
	RFT	16,974	24	353	16,626	0.9889	0.9796	0.9986	0.9890
	GBDT	16,888	110	332	16,647	0.9870	0.9807	0.9935	0.9871
	ABT	16,678	320	326	16,653	0.9810	0.9808	0.9812	0.9810
	SVM	16,140	858	228	16,751	0.9680	0.9861	0.9495	0.9675
1:99	MLP	16,913	85	407	16,572	0.9855	0.9765	0.9950	0.9857
	KNN	16,998	0	737	16,242	0.9783	0.9584	1.0000	0.9788
	GNB	16,802	196	6,187	10,792	0.8121	0.7309	0.9885	0.8404
	LRC	16,982	16	415	16,564	0.9873	0.9761	0.9991	0.9875
	QDA	16,687	311	444	16,535	0.9778	0.9741	0.9817	0.9779

Table 9 ML Models performance for Sorted List (Fixed Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	3,198	0	0	3,237	1.0000	1.0000	1.0000	1.0000
	RFT	3,198	0	19	3,218	0.9970	0.9941	1.0000	0.9970
	GBDT	3,198	0	1	3,236	0.9998	0.9997	1.0000	0.9998
	ABT	3,198	0	0	3,237	1.0000	1.0000	1.0000	1.0000
	SVM	3,198	0	0	3,237	1.0000	1.0000	1.0000	1.0000
75:25	MLP	3,198	0	0	3,237	1.0000	1.0000	1.0000	1.0000
	KNN	3,198	0	181	3,056	0.9719	0.9464	1.0000	0.9725
	GNB	3,198	0	3,236	1	0.4971	0.4970	1.0000	0.6640
	LRC	3,196	2	0	3,237	0.9997	1.0000	0.9994	0.9997
	QDA	3,198	0	3,236	1	0.4971	0.4970	1.0000	0.6640
	DT	6,388	0	0	6,482	1.0000	1.0000	1.0000	1.0000
	RFT	6,378	10	40	6,442	0.9961	0.9938	0.9984	0.9961
	GBDT	6,388	0	6	6,476	0.9995	0.9991	1.0000	0.9995
	ABT	6,388	0	0	6,482	1.0000	1.0000	1.0000	1.0000
	SVM	6,388	0	0	6,482	1.0000	1.0000	1.0000	1.0000
50:50	MLP	6,388	0	0	6,482	1.0000	1.0000	1.0000	1.0000
	KNN	6,388	0	380	6,102	0.9705	0.9439	1.0000	0.9711
	GNB	6,388	0	6,474	8	0.4970	0.4967	1.0000	0.6637
	LRC	6,386	2	0	6,482	0.9998	1.0000	0.9997	0.9998
	QDA	6,388	0	6,474	8	0.4970	0.4967	1.0000	0.6637
	DT	9,604	1	2	9,698	0.9998	0.9998	0.9999	0.9998
	RFT	9,584	21	84	9,616	0.9946	0.9913	0.9978	0.9946
	GBDT	9,600	5	6	9,694	0.9994	0.9994	0.9995	0.9994
	ABT	9,604	1	9	9,691	0.9995	0.9991	0.9999	0.9995
	SVM	9,604	1	8	9,692	0.9995	0.9992	0.9999	0.9995
25:75	MLP	9,604	1	0	9,700	0.9999	1.0000	0.9999	0.9999
	KNN	9,600	5	630	9,070	0.9671	0.9384	0.9995	0.9680
	GNB	9,605	0	9,683	17	0.4984	0.4980	1.0000	0.6649
	LRC	9,597	8	0	9,700	0.9996	1.0000	0.9992	0.9996
	QDA	9,605	0	9,683	17	0.4984	0.4980	1.0000	0.6649
	DT	11,568	9	7	11,582	0.9993	0.9994	0.9992	0.9993
	RFT	11,507	70	306	11,283	0.9838	0.9741	0.9940	0.9839
	GBDT	11,568	9	7	11,582	0.9993	0.9994	0.9992	0.9993
	ABT	11,568	9	7	11,582	0.9993	0.9994	0.9992	0.9993
	SVM	11,576	1	103	11,486	0.9955	0.9912	0.9999	0.9955
10:90	MLP	11,576	1	0	11,589	1.0000	1.0000	0.9999	1.0000
	KNN	11,545	32	801	10,788	0.9640	0.9351	0.9972	0.9652
	GNB	11,577	0	11,566	23	0.5007	0.5002	1.0000	0.6669
	LRC	11,569	8	23	11,566	0.9987	0.9980	0.9993	0.9987
	QDA	11,577	0	11,498	91	0.5037	0.5017	1.0000	0.6682
	DT	12,573	165	324	12,421	0.9808	0.9749	0.9870	0.9809
	RFT	12,086	652	970	11,775	0.9363	0.9257	0.9488	0.9371
	GBDT	12,573	165	324	12,421	0.9808	0.9749	0.9870	0.9809
	ABT	12,573	165	324	12,421	0.9808	0.9749	0.9870	0.9809
	SVM	12,706	32	946	11,799	0.9616	0.9307	0.9975	0.9629
1:99	MLP	12,591	147	792	11,953	0.9632	0.9408	0.9885	0.9641
	KNN	12,699	39	1,382	11,363	0.9442	0.9019	0.9969	0.9470
	GNB	12,653	85	3,554	9,191	0.8572	0.7807	0.9933	0.8743
	LRC	12,687	51	543	12,202	0.9767	0.9590	0.9960	0.9771
	QDA	12,738	0	4,959	7,786	0.8054	0.7198	1.0000	0.8371

Table 10 ML Models performance for Singly Linked List (Fixed Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	5,261	0	0	5,313	1.0000	1.0000	1.0000	1.0000
	RFT	5,261	0	0	5,313	1.0000	1.0000	1.0000	1.0000
	GBDT	5,261	0	0	5,313	1.0000	1.0000	1.0000	1.0000
	ABT	5,261	0	0	5,313	1.0000	1.0000	1.0000	1.0000
	SVM	5,261	0	1	5,312	0.9999	0.9998	1.0000	0.9999
75:25	MLP	5,261	0	0	5,313	1.0000	1.0000	1.0000	1.0000
	KNN	5,261	0	370	4,943	0.9650	0.9343	1.0000	0.9660
	GNB	5,261	0	70	5,243	0.9934	0.9869	1.0000	0.9934
	LRC	5,261	0	30	5,283	0.9972	0.9943	1.0000	0.9972
	QDA	0	5,261	0	5,313	0.5025	0.0000	0.0000	NaN
	DT	10,572	0	0	10,575	1.0000	1.0000	1.0000	1.0000
	RFT	10,572	0	0	10,575	1.0000	1.0000	1.0000	1.0000
	GBDT	10,572	0	0	10,575	1.0000	1.0000	1.0000	1.0000
	ABT	10,572	0	0	10,575	1.0000	1.0000	1.0000	1.0000
	SVM	10,572	0	3	10,572	0.9999	0.9997	1.0000	0.9999
50:50	MLP	10,572	0	0	10,575	1.0000	1.0000	1.0000	1.0000
	KNN	10,572	0	825	9,750	0.9610	0.9276	1.0000	0.9624
	GNB	10,572	0	154	10,421	0.9927	0.9856	1.0000	0.9928
	LRC	10,572	0	161	10,414	0.9924	0.9850	1.0000	0.9924
	QDA	0	10,572	0	10,575	0.5001	0.0000	0.0000	NaN
	DT	15,884	0	0	15,837	1.0000	1.0000	1.0000	1.0000
	RFT	15,884	0	0	15,837	1.0000	1.0000	1.0000	1.0000
	GBDT	15,884	0	0	15,837	1.0000	1.0000	1.0000	1.0000
	ABT	15,884	0	0	15,837	1.0000	1.0000	1.0000	1.0000
	SVM	15,884	0	16	15,821	0.9995	0.9990	1.0000	0.9995
25:75	MLP	15,884	0	0	15,837	1.0000	1.0000	1.0000	1.0000
	KNN	15,881	3	1,261	14,576	0.9602	0.9264	0.9998	0.9617
	GNB	15,884	0	233	15,604	0.9927	0.9855	1.0000	0.9927
	LRC	15,884	0	251	15,586	0.9921	0.9844	1.0000	0.9922
	QDA	0	15,884	0	15,837	0.4993	0.0000	0.0000	NaN
	DT	19,015	0	0	19,050	1.0000	1.0000	1.0000	1.0000
	RFT	19,015	0	0	19,050	1.0000	1.0000	1.0000	1.0000
	GBDT	19,015	0	0	19,050	1.0000	1.0000	1.0000	1.0000
	ABT	19,015	0	0	19,050	1.0000	1.0000	1.0000	1.0000
	SVM	19,015	0	249	18,801	0.9935	0.9871	1.0000	0.9935
10:90	MLP	19,015	0	0	19,050	1.0000	1.0000	1.0000	1.0000
	KNN	19,009	6	1,741	17,309	0.9541	0.9161	0.9997	0.9561
	GNB	19,015	0	278	18,772	0.9927	0.9856	1.0000	0.9927
	LRC	19,015	0	298	18,752	0.9922	0.9846	1.0000	0.9922
	QDA	0	19,015	0	19,050	0.5005	0.0000	0.0000	NaN
	DT	20,947	0	0	20,925	1.0000	1.0000	1.0000	1.0000
	RFT	20,872	75	7	20,918	0.9980	0.9997	0.9964	0.9980
	GBDT	20,947	0	0	20,925	1.0000	1.0000	1.0000	1.0000
	ABT	20,947	0	0	20,925	1.0000	1.0000	1.0000	1.0000
	SVM	20,947	0	1,399	19,526	0.9666	0.9374	1.0000	0.9677
1:99	MLP	20,947	0	505	20,420	0.9879	0.9765	1.0000	0.9881
	KNN	20,865	82	2,773	18,152	0.9318	0.8827	0.9961	0.9360
	GNB	20,947	0	305	20,620	0.9927	0.9856	1.0000	0.9928
	LRC	20,947	0	565	20,360	0.9865	0.9737	1.0000	0.9867
	QDA	0	20,947	0	20,925	0.4997	0.0000	0.0000	NaN

Table 11 ML Models performance for Binary Search Tree (Upto Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	55,569	291	851	54,885	0.9898	0.9849	0.9948	0.9898
	RBT	55,787	73	1,199	54,537	0.9886	0.9790	0.9987	0.9887
	GBDT	55,639	221	2,486	53,250	0.9757	0.9572	0.9960	0.9763
	ABT	55,533	327	2,850	52,886	0.9715	0.9512	0.9941	0.9722
	SVM	54,116	1,744	1,132	54,604	0.9742	0.9795	0.9688	0.9741
75:25	MLP	55,802	58	362	55,374	0.9962	0.9936	0.9990	0.9963
	KNN	54,988	872	3,479	52,257	0.9610	0.9405	0.9844	0.9619
	GNB	53,427	2,433	32,693	23,043	0.6852	0.6204	0.9564	0.7526
	LRC	54,167	1,693	4,384	51,352	0.9455	0.9251	0.9697	0.9469
	QDA	55,855	5	46,066	9,670	0.5872	0.5480	0.9999	0.7080
	DT	110,831	839	2,006	109,515	0.9873	0.9822	0.9925	0.9873
	RBT	111,492	178	2,535	108,986	0.9878	0.9778	0.9984	0.9880
	GBDT	111,209	461	4,873	106,648	0.9761	0.9580	0.9959	0.9766
	ABT	111,108	562	5,792	105,729	0.9715	0.9505	0.9950	0.9722
	SVM	106,372	5,298	2,257	109,264	0.9662	0.9792	0.9526	0.9657
50:50	MLP	111,331	339	976	110,545	0.9941	0.9913	0.9970	0.9941
	KNN	109,977	1,693	8,409	103,112	0.9547	0.9290	0.9848	0.9561
	GNB	106,915	4,755	65,465	46,056	0.6854	0.6202	0.9574	0.7528
	LRC	108,352	3,318	8,693	102,828	0.9462	0.9257	0.9703	0.9475
	QDA	111,658	12	92,284	19,237	0.5865	0.5475	0.9999	0.7076
	DT	165,655	1,815	3,354	163,963	0.9846	0.9802	0.9892	0.9846
	RBT	166,783	687	4,084	163,233	0.9857	0.9761	0.9959	0.9859
	GBDT	166,794	676	7,226	160,091	0.9764	0.9585	0.9960	0.9769
	ABT	166,625	845	8,297	159,020	0.9727	0.9526	0.9950	0.9733
	SVM	156,079	11,391	3,514	163,803	0.9555	0.9780	0.9320	0.9544
25:75	MLP	166,751	719	1,800	165,517	0.9925	0.9893	0.9957	0.9925
	KNN	164,506	2,964	15,236	152,081	0.9456	0.9152	0.9823	0.9476
	GNB	160,592	6,878	98,356	68,961	0.6857	0.6202	0.9589	0.7532
	LRC	162,415	5,055	12,898	154,419	0.9464	0.9264	0.9698	0.9476
	QDA	167,456	14	140,016	27,301	0.5817	0.5446	0.9999	0.7052
	DT	196,991	3,954	5,456	195,343	0.9766	0.9730	0.9803	0.9767
	RBT	199,473	1,472	5,748	195,051	0.9820	0.9720	0.9927	0.9822
	GBDT	200,154	791	8,667	192,132	0.9765	0.9585	0.9961	0.9769
	ABT	199,457	1,488	9,889	190,910	0.9717	0.9528	0.9926	0.9723
	SVM	181,999	18,946	4,719	196,080	0.9411	0.9747	0.9057	0.9390
10:90	MLP	198,751	2,194	3,102	197,697	0.9868	0.9846	0.9891	0.9869
	KNN	196,033	4,912	21,697	179,102	0.9338	0.9003	0.9756	0.9364
	GNB	192,652	8,293	118,002	82,797	0.6856	0.6201	0.9587	0.7531
	LRC	195,116	5,829	15,658	185,141	0.9465	0.9257	0.9710	0.9478
	QDA	200,918	27	168,704	32,095	0.5800	0.5436	0.9999	0.7043
	DT	208,917	12,117	11,363	209,522	0.9469	0.9484	0.9452	0.9468
	RBT	212,434	8,600	9,632	211,253	0.9587	0.9566	0.9611	0.9589
	GBDT	219,763	1,271	10,395	210,490	0.9736	0.9548	0.9942	0.9741
	ABT	219,803	1,231	11,294	209,591	0.9717	0.9511	0.9944	0.9723
	SVM	156,743	64,291	4,775	216,110	0.8437	0.9704	0.7091	0.8195
1:99	MLP	217,966	3,068	9,354	211,531	0.9719	0.9589	0.9861	0.9723
	KNN	211,126	9,908	32,606	188,279	0.9038	0.8662	0.9552	0.9085
	GNB	213,414	7,620	130,789	90,096	0.6868	0.6200	0.9655	0.7551
	LRC	215,078	5,956	17,491	203,394	0.9469	0.9248	0.9731	0.9483
	QDA	221,022	12	191,452	29,433	0.5667	0.5358	0.9999	0.6978

Table 12 ML Models performance for Binary Tree (Upto Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	5,924	10	4	5,919	0.9988	0.9993	0.9983	0.9988
	RFT	5,924	10	117	5,806	0.9893	0.9806	0.9983	0.9894
	GBDT	5,927	7	104	5,819	0.9906	0.9828	0.9988	0.9907
	ABT	5,879	55	260	5,663	0.9734	0.9576	0.9907	0.9739
	SVM	5,867	67	430	5,493	0.9581	0.9317	0.9887	0.9594
75:25	MLP	5,932	2	19	5,904	0.9982	0.9968	0.9997	0.9982
	KNN	5,921	13	695	5,228	0.9403	0.8950	0.9978	0.9436
	GNB	5,928	6	715	5,208	0.9392	0.8924	0.9990	0.9427
	LRC	5,928	6	176	5,747	0.9847	0.9712	0.9990	0.9849
	QDA	0	5,934	0	5,923	0.4995	0.0000	0.0000	NaN
	DT	11,897	15	24	11,778	0.9984	0.9980	0.9987	0.9984
	RFT	11,894	18	228	11,574	0.9896	0.9812	0.9985	0.9898
	GBDT	11,894	18	210	11,592	0.9904	0.9827	0.9985	0.9905
	ABT	11,844	68	509	11,293	0.9757	0.9588	0.9943	0.9762
	SVM	11,728	184	922	10,880	0.9534	0.9271	0.9846	0.9550
50:50	MLP	11,908	4	104	11,698	0.9954	0.9913	0.9997	0.9955
	KNN	11,876	36	1,368	10,434	0.9408	0.8967	0.9970	0.9442
	GNB	11,902	10	1,373	10,429	0.9417	0.8966	0.9992	0.9451
	LRC	11,902	10	353	11,449	0.9847	0.9712	0.9992	0.9850
	QDA	0	11,912	0	11,802	0.4977	0.0000	0.0000	NaN
	DT	17,812	30	78	17,651	0.9970	0.9956	0.9983	0.9970
	RFT	17,799	43	351	17,378	0.9889	0.9807	0.9976	0.9891
	GBDT	17,789	53	320	17,409	0.9895	0.9823	0.9970	0.9896
	ABT	17,679	163	738	16,991	0.9747	0.9599	0.9909	0.9752
	SVM	17,230	612	1,400	16,329	0.9434	0.9249	0.9657	0.9448
25:75	MLP	17,815	27	286	17,443	0.9912	0.9842	0.9985	0.9913
	KNN	17,735	107	1,954	15,775	0.9421	0.9008	0.9940	0.9451
	GNB	17,824	18	1,581	16,148	0.9550	0.9185	0.9990	0.9571
	LRC	17,824	18	515	17,214	0.9850	0.9719	0.9990	0.9853
	QDA	0	17,842	0	17,729	0.4984	0.0000	0.0000	NaN
	DT	21,184	185	154	21,163	0.9921	0.9928	0.9913	0.9921
	RFT	21,182	187	593	20,724	0.9817	0.9728	0.9912	0.9819
	GBDT	21,302	67	429	20,888	0.9884	0.9803	0.9969	0.9885
	ABT	20,859	510	901	20,416	0.9669	0.9586	0.9761	0.9673
	SVM	19,290	2,079	1,624	19,693	0.9133	0.9223	0.9027	0.9124
10:90	MLP	21,190	179	660	20,657	0.9803	0.9698	0.9916	0.9806
	KNN	21,151	218	2,420	18,897	0.9382	0.8973	0.9898	0.9413
	GNB	21,308	61	1,888	19,429	0.9543	0.9186	0.9971	0.9563
	LRC	21,348	21	635	20,682	0.9846	0.9711	0.9990	0.9849
	QDA	0	21,369	0	21,317	0.4994	0.0000	0.0000	NaN
	DT	22,416	1,081	620	22,837	0.9638	0.9731	0.9540	0.9634
	RFT	22,757	740	998	22,459	0.9630	0.9580	0.9685	0.9632
	GBDT	22,877	620	799	22,658	0.9698	0.9663	0.9736	0.9699
	ABT	22,501	996	1,091	22,366	0.9556	0.9538	0.9576	0.9557
	SVM	2,811	20,686	239	23,218	0.5544	0.9216	0.1196	0.2118
1:99	MLP	23,220	277	1,429	22,028	0.9637	0.9420	0.9882	0.9646
	KNN	22,744	753	2,534	20,923	0.9300	0.8998	0.9680	0.9326
	GNB	23,432	65	2,102	21,355	0.9538	0.9177	0.9972	0.9558
	LRC	23,471	26	902	22,555	0.9802	0.9630	0.9989	0.9806
	QDA	0	23,497	0	23,457	0.4996	0.0000	0.0000	NaN

Table 13 ML Models performance for Red Black Tree (Upto Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	34,497	9	72	34,295	0.9988	0.9979	0.9997	0.9988
	RBT	34,503	3	248	34,119	0.9964	0.9929	0.9999	0.9964
	GBDT	34,486	20	1,024	33,343	0.9848	0.9712	0.9994	0.9851
	ABT	34,360	146	1,655	32,712	0.9739	0.9540	0.9958	0.9745
	SVM	34,506	0	361	34,006	0.9948	0.9896	1.0000	0.9948
75:25	MLP	34,501	5	111	34,256	0.9983	0.9968	0.9999	0.9983
	KNN	34,506	0	603	33,764	0.9912	0.9828	1.0000	0.9913
	GNB	33,961	545	15,995	18,372	0.7598	0.6798	0.9842	0.8042
	LRC	34,375	131	1,434	32,933	0.9773	0.9600	0.9962	0.9777
	QDA	33,586	920	2,599	31,768	0.9489	0.9282	0.9733	0.9502
	DT	69,074	48	186	68,437	0.9983	0.9973	0.9993	0.9983
	RBT	69,107	15	586	68,037	0.9956	0.9916	0.9998	0.9957
	GBDT	69,111	11	2,110	66,513	0.9846	0.9704	0.9998	0.9849
	ABT	68,891	231	3,264	65,359	0.9746	0.9548	0.9967	0.9753
	SVM	69,122	0	816	67,807	0.9941	0.9883	1.0000	0.9941
50:50	MLP	69,102	20	382	68,241	0.9971	0.9945	0.9997	0.9971
	KNN	69,122	0	1,354	67,269	0.9902	0.9808	1.0000	0.9903
	GNB	68,029	1,093	31,829	36,794	0.7610	0.6813	0.9842	0.8052
	LRC	68,888	234	2,853	65,770	0.9776	0.9602	0.9966	0.9781
	QDA	46,486	22,636	4,599	64,024	0.8023	0.9100	0.6725	0.7734
	DT	103,394	121	463	102,640	0.9972	0.9955	0.9988	0.9972
	RBT	103,489	26	1,186	101,917	0.9941	0.9887	0.9997	0.9942
	GBDT	103,474	41	3,189	99,914	0.9844	0.9701	0.9996	0.9846
	ABT	103,132	383	4,613	98,490	0.9758	0.9572	0.9963	0.9764
	SVM	103,515	0	1,557	101,546	0.9925	0.9852	1.0000	0.9925
25:75	MLP	103,501	14	788	102,315	0.9961	0.9924	0.9999	0.9961
	KNN	103,515	0	2,440	100,663	0.9882	0.9770	1.0000	0.9884
	GNB	101,823	1,692	47,733	55,370	0.7608	0.6808	0.9837	0.8047
	LRC	103,171	344	4,270	98,833	0.9777	0.9603	0.9967	0.9781
	QDA	101,492	2,023	9,224	93,879	0.9456	0.9167	0.9805	0.9475
	DT	123,471	507	1,123	122,840	0.9934	0.9910	0.9959	0.9934
	RBT	123,929	49	2,009	121,954	0.9917	0.9840	0.9996	0.9918
	GBDT	123,913	65	3,879	120,084	0.9841	0.9696	0.9995	0.9843
	ABT	123,431	547	5,999	117,964	0.9736	0.9537	0.9956	0.9742
	SVM	123,978	0	2,552	121,411	0.9897	0.9798	1.0000	0.9898
10:90	MLP	123,898	80	1,397	122,566	0.9940	0.9889	0.9994	0.9941
	KNN	123,978	0	4,015	119,948	0.9838	0.9686	1.0000	0.9841
	GNB	121,951	2,027	57,211	66,752	0.7611	0.6807	0.9837	0.8046
	LRC	123,483	495	5,135	118,828	0.9773	0.9601	0.9960	0.9777
	QDA	123,978	0	30,994	92,969	0.8750	0.8000	1.0000	0.8889
	DT	135,196	1,162	4,290	132,088	0.9800	0.9692	0.9915	0.9802
	RBT	135,893	465	5,870	130,508	0.9768	0.9586	0.9966	0.9772
	GBDT	136,303	55	5,705	130,673	0.9789	0.9598	0.9996	0.9793
	ABT	135,920	438	7,260	129,118	0.9718	0.9493	0.9968	0.9725
	SVM	135,727	631	5,809	130,569	0.9764	0.9590	0.9954	0.9768
1:99	MLP	136,143	215	4,529	131,849	0.9826	0.9678	0.9984	0.9829
	KNN	136,267	91	11,652	124,726	0.9569	0.9212	0.9993	0.9587
	GNB	134,654	1,704	63,556	72,822	0.7607	0.6794	0.9875	0.8049
	LRC	135,766	592	6,237	130,141	0.9750	0.9561	0.9957	0.9755
	QDA	136,242	116	26,494	109,884	0.9024	0.8372	0.9991	0.9110

Table 14 ML Models performance for Sorted List (Upto Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	6,079	1	5	6,070	0.9995	0.9992	0.9998	0.9995
	RFT	6,077	3	43	6,032	0.9962	0.9930	0.9995	0.9962
	GBDT	6,043	37	181	5,894	0.9821	0.9709	0.9939	0.9823
	ABT	5,633	447	1,124	4,951	0.8708	0.8337	0.9265	0.8776
	SVM	6,080	0	15	6,060	0.9988	0.9975	1.0000	0.9988
75:25	MLP	6,080	0	10	6,065	0.9992	0.9984	1.0000	0.9992
	KNN	6,079	1	347	5,728	0.9714	0.9460	0.9998	0.9722
	GNB	6,054	26	5,235	840	0.5672	0.5363	0.9957	0.6971
	LRC	5,457	623	1,174	4,901	0.8522	0.8230	0.8975	0.8586
	QDA	6,080	0	6,064	11	0.5011	0.5007	1.0000	0.6673
	DT	12,217	5	20	12,068	0.9990	0.9984	0.9996	0.9990
	RFT	12,212	10	73	12,015	0.9966	0.9941	0.9992	0.9966
	GBDT	12,160	62	371	11,717	0.9822	0.9704	0.9949	0.9825
	ABT	10,519	1,703	2,223	9,865	0.8385	0.8255	0.8607	0.8427
	SVM	12,220	2	61	12,027	0.9974	0.9950	0.9998	0.9974
50:50	MLP	12,222	0	8	12,080	0.9997	0.9993	1.0000	0.9997
	KNN	12,216	6	733	11,355	0.9696	0.9434	0.9995	0.9706
	GNB	12,163	59	10,518	1,570	0.5649	0.5363	0.9952	0.6970
	LRC	11,005	1,217	2,339	9,749	0.8537	0.8247	0.9004	0.8609
	QDA	12,222	0	12,068	20	0.5036	0.5032	1.0000	0.6695
	DT	18,263	37	64	18,101	0.9972	0.9965	0.9980	0.9972
	RFT	18,202	98	220	17,945	0.9913	0.9881	0.9946	0.9913
	GBDT	18,190	110	513	17,652	0.9829	0.9726	0.9940	0.9832
	ABT	15,113	3,187	3,385	14,780	0.8198	0.8170	0.8258	0.8214
	SVM	18,293	7	188	17,977	0.9947	0.9898	0.9996	0.9947
25:75	MLP	18,294	6	45	18,120	0.9986	0.9975	0.9997	0.9986
	KNN	18,273	27	1,262	16,903	0.9647	0.9354	0.9985	0.9659
	GNB	18,187	113	15,699	2,466	0.5664	0.5367	0.9938	0.6970
	LRC	16,342	1,958	3,430	14,735	0.8522	0.8265	0.8930	0.8585
	QDA	18,300	0	18,135	30	0.5027	0.5023	1.0000	0.6687
	DT	21,827	90	85	21,756	0.9960	0.9961	0.9959	0.9960
	RFT	21,718	199	554	21,287	0.9828	0.9751	0.9909	0.9830
	GBDT	21,680	237	625	21,216	0.9803	0.9720	0.9892	0.9805
	ABT	18,641	3,276	3,828	18,013	0.8377	0.8296	0.8505	0.8399
	SVM	21,902	15	586	21,255	0.9863	0.9739	0.9993	0.9865
10:90	MLP	21,894	23	206	21,635	0.9948	0.9907	0.9990	0.9948
	KNN	21,847	70	1,833	20,008	0.9565	0.9226	0.9968	0.9583
	GNB	10,896	11,021	1,650	20,191	0.7104	0.8685	0.4971	0.6323
	LRC	19,605	2,312	4,103	17,738	0.8534	0.8269	0.8945	0.8594
	QDA	21,916	1	21,801	40	0.5018	0.5013	1.0000	0.6678
	DT	22,475	1,614	1,403	22,642	0.9373	0.9412	0.9330	0.9371
	RFT	21,022	3,067	1,504	22,541	0.9050	0.9332	0.8727	0.9019
	GBDT	23,170	919	741	23,304	0.9655	0.9690	0.9618	0.9654
	ABT	18,865	5,224	3,363	20,682	0.8216	0.8487	0.7831	0.8146
	SVM	23,721	368	2,188	21,857	0.9469	0.9156	0.9847	0.9489
1:99	MLP	23,734	355	2,106	21,939	0.9489	0.9185	0.9853	0.9507
	KNN	23,668	421	2,914	21,131	0.9307	0.8904	0.9825	0.9342
	GNB	24,034	55	23,988	57	0.5005	0.5005	0.9977	0.6666
	LRC	20,240	3,849	4,105	19,940	0.8348	0.8314	0.8402	0.8358
	QDA	23,408	681	12,036	12,009	0.7358	0.6604	0.9717	0.7864

Table 15 ML Models performance for Singly Linked List (Upto Size - Standard Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	6,642	0	1	6,579	0.9999	0.9998	1.0000	0.9999
	RFT	6,641	1	6	6,574	0.9995	0.9991	0.9998	0.9995
	GBDT	6,642	0	0	6,580	1.0000	1.0000	1.0000	1.0000
	ABT	6,534	108	381	6,199	0.9630	0.9449	0.9837	0.9639
	SVM	6,642	0	116	6,464	0.9912	0.9828	1.0000	0.9913
75:25	MLP	6,642	0	0	6,580	1.0000	1.0000	1.0000	1.0000
	KNN	6,641	1	393	6,187	0.9702	0.9441	0.9998	0.9712
	GNB	82	6,560	12	6,568	0.5029	0.8723	0.0123	0.0243
	LRC	6,642	0	88	6,492	0.9933	0.9869	1.0000	0.9934
	QDA	0	6,642	0	6,580	0.4977	0.0000	0.0000	NaN
	DT	13,234	1	2	13,206	0.9999	0.9998	0.9999	0.9999
	RFT	13,231	4	8	13,200	0.9995	0.9994	0.9997	0.9995
	GBDT	13,234	1	7	13,201	0.9997	0.9995	0.9999	0.9997
	ABT	13,004	231	740	12,468	0.9633	0.9462	0.9825	0.9640
	SVM	13,235	0	265	12,943	0.9900	0.9804	1.0000	0.9901
50:50	MLP	13,234	1	0	13,208	1.0000	1.0000	0.9999	1.0000
	KNN	13,231	4	785	12,423	0.9702	0.9440	0.9997	0.9710
	GNB	13,235	0	1,453	11,755	0.9451	0.9011	1.0000	0.9480
	LRC	13,234	1	164	13,044	0.9938	0.9878	0.9999	0.9938
	QDA	0	13,235	0	13,208	0.4995	0.0000	0.0000	NaN
	DT	19,889	5	3	19,768	0.9998	0.9998	0.9997	0.9998
	RFT	19,867	27	40	19,731	0.9983	0.9980	0.9986	0.9983
	GBDT	19,884	10	8	19,763	0.9995	0.9996	0.9995	0.9995
	ABT	19,486	408	1,093	18,678	0.9622	0.9469	0.9795	0.9629
	SVM	19,887	7	450	19,321	0.9885	0.9779	0.9996	0.9886
25:75	MLP	19,893	1	4	19,767	0.9999	0.9998	0.9999	0.9999
	KNN	19,871	23	1,262	18,509	0.9676	0.9403	0.9988	0.9687
	GNB	19,682	212	1,092	18,679	0.9671	0.9474	0.9893	0.9679
	LRC	19,875	19	262	19,509	0.9929	0.9870	0.9990	0.9930
	QDA	0	19,894	0	19,771	0.4984	0.0000	0.0000	NaN
	DT	23,809	24	14	23,751	0.9992	0.9994	0.9990	0.9992
	RFT	23,789	44	46	23,719	0.9981	0.9981	0.9982	0.9981
	GBDT	23,809	24	16	23,749	0.9992	0.9993	0.9990	0.9992
	ABT	23,354	479	1,306	22,459	0.9625	0.9470	0.9799	0.9632
	SVM	23,809	24	619	23,146	0.9865	0.9747	0.9990	0.9867
10:90	MLP	23,809	24	18	23,747	0.9991	0.9992	0.9990	0.9991
	KNN	23,814	19	1,725	22,040	0.9634	0.9325	0.9992	0.9647
	GNB	23,761	72	3,810	19,955	0.9184	0.8618	0.9970	0.9245
	LRC	23,765	68	360	23,405	0.9910	0.9851	0.9971	0.9911
	QDA	0	23,833	0	23,765	0.4993	0.0000	0.0000	NaN
	DT	26,173	24	108	26,053	0.9975	0.9959	0.9991	0.9975
	RFT	26,087	110	362	25,799	0.9910	0.9863	0.9958	0.9910
	GBDT	26,173	24	185	25,976	0.9960	0.9930	0.9991	0.9960
	ABT	25,590	607	867	25,294	0.9718	0.9672	0.9768	0.9720
	SVM	26,171	26	1,278	24,883	0.9751	0.9534	0.9990	0.9757
1:99	MLP	26,153	44	775	25,386	0.9844	0.9712	0.9983	0.9846
	KNN	26,179	18	2,734	23,427	0.9474	0.9054	0.9993	0.9501
	GNB	26,173	24	5,547	20,614	0.8936	0.8251	0.9991	0.9038
	LRC	26,176	21	610	25,551	0.9879	0.9772	0.9992	0.9881
	QDA	0	26,197	0	26,161	0.4997	0.0000	0.0000	NaN

Table 16 ML Models performance for Binary Heap (Fixed Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	26,908	10	5	26,785	0.9997	0.9998	0.9996	0.9997
	RFT	26,903	15	15	26,775	0.9994	0.9994	0.9994	0.9994
	GBDT	26,824	94	264	26,526	0.9933	0.9903	0.9965	0.9934
	ABT	26,294	624	811	25,979	0.9733	0.9701	0.9768	0.9734
	SVM	26,877	41	75	26,715	0.9978	0.9972	0.9985	0.9978
75:25	MLP	26,917	1	4	26,786	0.9999	0.9999	1.0000	0.9999
	KNN	26,909	9	75	26,715	0.9984	0.9972	0.9997	0.9984
	GNB	26,918	0	2,920	23,870	0.9456	0.9021	1.0000	0.9486
	LRC	26,397	521	993	25,797	0.9718	0.9637	0.9806	0.9721
	QDA	26,909	9	2,620	24,170	0.9511	0.9113	0.9997	0.9534
	DT	53,896	22	25	53,473	0.9996	0.9995	0.9996	0.9996
	RFT	53,873	45	66	53,432	0.9990	0.9988	0.9992	0.9990
	GBDT	53,727	191	471	53,027	0.9938	0.9913	0.9965	0.9939
	ABT	52,749	1,169	1,582	51,916	0.9744	0.9709	0.9783	0.9746
	SVM	53,836	82	247	53,251	0.9969	0.9954	0.9985	0.9970
50:50	MLP	53,908	10	6	53,492	0.9999	0.9999	0.9998	0.9999
	KNN	53,876	42	311	53,187	0.9967	0.9943	0.9992	0.9967
	GNB	53,918	0	5,793	47,705	0.9461	0.9030	1.0000	0.9490
	LRC	52,843	1,075	2,009	51,489	0.9713	0.9634	0.9801	0.9716
	QDA	53,916	2	5,176	48,322	0.9518	0.9124	1.0000	0.9542
	DT	80,540	86	68	80,430	0.9990	0.9992	0.9989	0.9990
	RFT	80,499	127	170	80,328	0.9982	0.9979	0.9984	0.9982
	GBDT	80,361	265	636	79,862	0.9944	0.9921	0.9967	0.9944
	ABT	78,968	1,658	2,375	78,123	0.9750	0.9708	0.9794	0.9751
	SVM	80,508	118	829	79,669	0.9941	0.9898	0.9985	0.9942
25:75	MLP	80,613	13	20	80,478	0.9998	0.9998	0.9998	0.9998
	KNN	80,500	126	696	79,802	0.9949	0.9914	0.9984	0.9949
	GNB	80,626	0	8,805	71,693	0.9454	0.9015	1.0000	0.9482
	LRC	79,051	1,575	3,206	77,292	0.9703	0.9610	0.9805	0.9706
	QDA	76,818	3,808	6,649	73,849	0.9351	0.9203	0.9528	0.9363
	DT	96,504	187	136	96,522	0.9983	0.9986	0.9981	0.9983
	RFT	96,366	325	480	96,178	0.9958	0.9950	0.9966	0.9958
	GBDT	96,235	456	665	95,993	0.9942	0.9931	0.9953	0.9942
	ABT	94,750	1,941	3,179	93,479	0.9735	0.9675	0.9799	0.9737
	SVM	96,431	260	1,440	95,218	0.9912	0.9853	0.9973	0.9913
10:90	MLP	96,637	54	137	96,521	0.9990	0.9986	0.9994	0.9990
	KNN	96,434	257	1,283	95,375	0.9920	0.9869	0.9973	0.9921
	GNB	96,691	0	10,588	86,070	0.9452	0.9013	1.0000	0.9481
	LRC	94,520	2,171	3,756	92,902	0.9693	0.9618	0.9775	0.9696
	QDA	96,687	4	9,431	87,227	0.9512	0.9111	1.0000	0.9535
	DT	104,931	1,395	1,571	104,787	0.9861	0.9852	0.9869	0.9861
	RFT	105,129	1,197	1,956	104,402	0.9852	0.9817	0.9887	0.9852
	GBDT	105,556	770	1,579	104,779	0.9890	0.9853	0.9928	0.9890
	ABT	104,254	2,072	3,917	102,441	0.9718	0.9638	0.9805	0.9721
	SVM	105,359	967	4,464	101,894	0.9745	0.9594	0.9909	0.9749
1:99	MLP	105,584	742	924	105,434	0.9922	0.9913	0.9930	0.9922
	KNN	105,651	675	3,174	103,184	0.9819	0.9708	0.9937	0.9821
	GNB	106,326	0	11,901	94,457	0.9440	0.8993	1.0000	0.9470
	LRC	103,878	2,448	5,028	101,330	0.9648	0.9538	0.9770	0.9653
	QDA	106,318	8	10,438	95,920	0.9509	0.9106	0.9999	0.9532

Table 17 ML Models performance for Binary Search Tree (Fixed Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	4,149	11	35	4,203	0.9945	0.9916	0.9974	0.9945
	RFT	4,159	1	62	4,176	0.9925	0.9853	0.9998	0.9925
	GBDT	4,159	1	96	4,142	0.9884	0.9774	0.9998	0.9885
	ABT	4,157	3	107	4,131	0.9869	0.9749	0.9993	0.9869
	SVM	4,160	0	95	4,143	0.9887	0.9777	1.0000	0.9887
75:25	MLP	4,152	8	37	4,201	0.9946	0.9912	0.9981	0.9946
	KNN	4,160	0	232	4,006	0.9724	0.9472	1.0000	0.9729
	GNB	4,155	5	4,224	14	0.4964	0.4959	0.9988	0.6627
	LRC	4,160	0	187	4,051	0.9777	0.9570	1.0000	0.9780
	QDA	4,160	0	30	4,208	0.9964	0.9928	1.0000	0.9964
	DT	8,297	59	102	8,338	0.9904	0.9879	0.9929	0.9904
	RFT	8,343	13	132	8,308	0.9914	0.9844	0.9984	0.9914
	GBDT	8,354	2	235	8,205	0.9859	0.9726	0.9998	0.9860
	ABT	8,333	23	215	8,225	0.9858	0.9748	0.9972	0.9859
	SVM	8,356	0	213	8,227	0.9873	0.9751	1.0000	0.9874
50:50	MLP	8,348	8	110	8,330	0.9930	0.9870	0.9990	0.9930
	KNN	8,356	0	517	7,923	0.9692	0.9417	1.0000	0.9700
	GNB	8,356	0	8,423	17	0.4985	0.4980	1.0000	0.6649
	LRC	8,356	0	394	8,046	0.9765	0.9550	1.0000	0.9770
	QDA	8,356	0	63	8,377	0.9962	0.9925	1.0000	0.9962
	DT	12,445	107	170	12,472	0.9890	0.9865	0.9915	0.9890
	RFT	12,531	21	301	12,341	0.9872	0.9765	0.9983	0.9873
	GBDT	12,550	2	352	12,290	0.9859	0.9727	0.9998	0.9861
	ABT	12,497	55	325	12,317	0.9849	0.9747	0.9956	0.9850
	SVM	12,552	0	374	12,268	0.9852	0.9711	1.0000	0.9853
25:75	MLP	12,501	51	208	12,434	0.9897	0.9836	0.9959	0.9897
	KNN	12,549	3	964	11,678	0.9616	0.9287	0.9998	0.9629
	GNB	12,526	26	12,598	44	0.4989	0.4986	0.9979	0.6649
	LRC	12,551	1	612	12,030	0.9757	0.9535	0.9999	0.9762
	QDA	12,551	1	84	12,558	0.9966	0.9934	0.9999	0.9966
	DT	14,884	190	379	14,780	0.9812	0.9752	0.9874	0.9812
	RFT	14,880	194	423	14,736	0.9796	0.9724	0.9871	0.9797
	GBDT	15,058	16	446	14,713	0.9847	0.9712	0.9989	0.9849
	ABT	15,020	54	480	14,679	0.9823	0.9690	0.9964	0.9825
	SVM	15,074	0	579	14,580	0.9808	0.9630	1.0000	0.9812
10:90	MLP	15,027	47	341	14,818	0.9872	0.9778	0.9969	0.9873
	KNN	15,060	14	1,413	13,746	0.9528	0.9142	0.9991	0.9548
	GNB	15,023	51	15,002	157	0.5021	0.5003	0.9966	0.6662
	LRC	15,074	0	865	14,294	0.9714	0.9457	1.0000	0.9721
	QDA	15,074	0	102	15,057	0.9966	0.9933	1.0000	0.9966
	DT	14,800	1,835	936	15,686	0.9167	0.9405	0.8897	0.9144
	RFT	15,652	983	817	15,805	0.9459	0.9504	0.9409	0.9456
	GBDT	15,659	976	916	15,706	0.9431	0.9447	0.9413	0.9430
	ABT	15,764	871	888	15,734	0.9471	0.9467	0.9476	0.9472
	SVM	16,635	0	1,329	15,293	0.9600	0.9260	1.0000	0.9616
1:99	MLP	16,500	135	1,221	15,401	0.9592	0.9311	0.9919	0.9605
	KNN	16,385	250	2,239	14,383	0.9252	0.8798	0.9850	0.9294
	GNB	16,036	599	15,900	722	0.5039	0.5021	0.9640	0.6603
	LRC	16,456	179	1,502	15,120	0.9495	0.9164	0.9892	0.9514
	QDA	44	16,591	2	16,620	0.5011	0.9565	0.0026	0.0053

Table 18 ML Models performance for Binary Tree (Fixed Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	4,138	22	35	4,203	0.9932	0.9916	0.9947	0.9932
	RFT	4,117	43	71	4,167	0.9864	0.9830	0.9897	0.9863
	GBDT	4,160	0	735	3,503	0.9125	0.8498	1.0000	0.9188
	ABT	4,160	0	925	3,313	0.8899	0.8181	1.0000	0.8999
	SVM	4,094	66	351	3,887	0.9503	0.9210	0.9841	0.9515
75:25	MLP	4,159	1	0	4,238	0.9999	1.0000	0.9998	0.9999
	KNN	3,949	211	3,583	655	0.5482	0.5243	0.9493	0.6755
	GNB	4,155	5	288	3,950	0.9651	0.9352	0.9988	0.9659
	LRC	4,160	0	292	3,946	0.9652	0.9344	1.0000	0.9661
	QDA	4,155	5	0	4,238	0.9994	1.0000	0.9988	0.9994
	DT	8,300	56	171	8,269	0.9865	0.9798	0.9933	0.9865
	RFT	8,276	80	236	8,204	0.9812	0.9723	0.9904	0.9813
	GBDT	8,356	0	1,478	6,962	0.9120	0.8497	1.0000	0.9187
	ABT	8,356	0	1,833	6,607	0.8909	0.8201	1.0000	0.9012
	SVM	8,005	351	745	7,695	0.9347	0.9149	0.9580	0.9359
50:50	MLP	8,351	5	6	8,434	0.9993	0.9993	0.9994	0.9993
	KNN	8,091	265	7,343	1,097	0.5470	0.5242	0.9683	0.6802
	GNB	8,350	6	576	7,864	0.9653	0.9355	0.9993	0.9663
	LRC	8,353	3	584	7,856	0.9651	0.9347	0.9996	0.9661
	QDA	8,354	2	1	8,439	0.9998	0.9999	0.9998	0.9998
	DT	12,348	204	488	12,154	0.9725	0.9620	0.9837	0.9727
	RFT	12,362	190	445	12,197	0.9748	0.9653	0.9849	0.9750
	GBDT	12,552	0	2,076	10,566	0.9176	0.8581	1.0000	0.9236
	ABT	12,552	0	2,554	10,088	0.8986	0.8309	1.0000	0.9077
	SVM	9,820	2,732	5,035	7,607	0.6917	0.6611	0.7823	0.7166
25:75	MLP	12,550	2	17	12,625	0.9992	0.9986	0.9998	0.9992
	KNN	10,488	2,064	10,035	2,607	0.5198	0.5110	0.8356	0.6342
	GNB	12,552	0	828	11,814	0.9671	0.9381	1.0000	0.9681
	LRC	12,533	19	848	11,794	0.9656	0.9366	0.9985	0.9666
	QDA	12,552	0	7	12,635	0.9997	0.9994	1.0000	0.9997
	DT	14,704	370	867	14,292	0.9591	0.9443	0.9755	0.9596
	RFT	14,477	597	839	14,320	0.9525	0.9452	0.9604	0.9527
	GBDT	15,074	0	2,598	12,561	0.9141	0.8530	1.0000	0.9207
	ABT	15,074	0	3,044	12,115	0.8993	0.8320	1.0000	0.9083
	SVM	11,215	3,859	5,008	10,151	0.7067	0.6913	0.7440	0.7167
10:90	MLP	15,074	0	165	14,994	0.9945	0.9892	1.0000	0.9946
	KNN	12,397	2,677	11,439	3,720	0.5331	0.5201	0.8224	0.6372
	GNB	15,074	0	1,089	14,070	0.9640	0.9326	1.0000	0.9651
	LRC	14,928	146	833	14,326	0.9676	0.9471	0.9903	0.9683
	QDA	15,074	0	59	15,100	0.9980	0.9961	1.0000	0.9980
	DT	12,636	3,999	7,712	8,910	0.6479	0.6210	0.7596	0.6833
	RFT	11,311	5,324	6,571	10,051	0.6423	0.6325	0.6800	0.6554
	GBDT	13,267	3,368	2,956	13,666	0.8098	0.8178	0.7975	0.8075
	ABT	15,383	1,252	3,846	12,776	0.8467	0.8000	0.9247	0.8579
	SVM	4	16,631	4	16,618	0.4998	0.5000	0.0002	0.0005
1:99	MLP	15,504	1,131	2,198	14,424	0.8999	0.8758	0.9320	0.9030
	KNN	12,421	4,214	11,330	5,292	0.5326	0.5230	0.7467	0.6151
	GNB	16,011	624	2,335	14,287	0.9110	0.8727	0.9625	0.9154
	LRC	13,366	3,269	3,895	12,727	0.7846	0.7743	0.8035	0.7886
	QDA	16,011	624	6,708	9,914	0.7795	0.7047	0.9625	0.8137

Table 19 ML Models performance for Directed Acyclic Graph (Fixed Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	4,880	44	109	4,815	0.9845	0.9782	0.9911	0.9846
	RFT	4,789	135	357	4,567	0.9500	0.9306	0.9726	0.9511
	GBDT	4,386	538	665	4,259	0.8778	0.8683	0.8907	0.8794
	ABT	4,030	894	924	4,000	0.8154	0.8135	0.8184	0.8160
	SVM	4,318	606	1,120	3,804	0.8247	0.7940	0.8769	0.8334
75:25	MLP	4,922	2	65	4,859	0.9932	0.9870	0.9996	0.9932
	KNN	4,860	64	1,647	3,277	0.8263	0.7469	0.9870	0.8503
	GNB	4,890	34	4,345	579	0.5553	0.5295	0.9931	0.6907
	LRC	4,037	887	1,021	3,903	0.8063	0.7981	0.8199	0.8089
	QDA	4,868	56	4,293	631	0.5584	0.5314	0.9886	0.6912
	DT	9,783	99	196	9,618	0.9850	0.9804	0.9900	0.9851
	RFT	9,479	403	774	9,040	0.9402	0.9245	0.9592	0.9415
	GBDT	8,687	1,195	1,450	8,364	0.8657	0.8570	0.8791	0.8679
	ABT	8,036	1,846	1,911	7,903	0.8093	0.8079	0.8132	0.8105
	SVM	8,586	1,296	2,407	7,407	0.8120	0.7810	0.8689	0.8226
50:50	MLP	9,877	5	141	9,673	0.9926	0.9859	0.9995	0.9927
	KNN	9,675	207	3,287	6,527	0.8226	0.7464	0.9791	0.8470
	GNB	9,815	67	8,639	1,175	0.5580	0.5319	0.9932	0.6928
	LRC	8,106	1,776	2,090	7,724	0.8037	0.7950	0.8203	0.8075
	QDA	9,882	0	9,106	708	0.5377	0.5204	1.0000	0.6846
	DT	14,454	355	574	14,161	0.9686	0.9618	0.9760	0.9689
	RFT	13,892	917	1,296	13,439	0.9251	0.9147	0.9381	0.9262
	GBDT	13,063	1,746	2,000	12,735	0.8732	0.8672	0.8821	0.8746
	ABT	11,921	2,888	2,866	11,869	0.8052	0.8062	0.8050	0.8056
	SVM	12,603	2,206	3,514	11,221	0.8064	0.7820	0.8510	0.8150
25:75	MLP	14,750	59	357	14,378	0.9859	0.9764	0.9960	0.9861
	KNN	14,143	666	5,044	9,691	0.8067	0.7371	0.9550	0.8320
	GNB	14,720	89	12,991	1,744	0.5573	0.5312	0.9940	0.6924
	LRC	12,185	2,624	3,098	11,637	0.8063	0.7973	0.8228	0.8098
	QDA	14,809	0	13,656	1,079	0.5378	0.5203	1.0000	0.6844
	DT	16,717	995	1,269	16,472	0.9361	0.9294	0.9438	0.9366
	RFT	15,754	1,958	2,293	15,448	0.8801	0.8729	0.8895	0.8811
	GBDT	15,400	2,312	2,599	15,142	0.8615	0.8556	0.8695	0.8625
	ABT	14,383	3,329	3,509	14,232	0.8071	0.8039	0.8120	0.8079
	SVM	14,591	3,121	4,143	13,598	0.7951	0.7789	0.8238	0.8007
10:90	MLP	17,379	333	1,244	16,497	0.9555	0.9332	0.9812	0.9566
	KNN	16,200	1,512	6,020	11,721	0.7875	0.7291	0.9146	0.8114
	GNB	17,566	146	15,597	2,144	0.5559	0.5297	0.9918	0.6906
	LRC	14,597	3,115	3,747	13,994	0.8064	0.7957	0.8241	0.8097
	QDA	17,686	26	16,251	1,490	0.5409	0.5211	0.9985	0.6849
	DT	14,689	4,825	4,398	15,087	0.7635	0.7696	0.7527	0.7611
	RFT	13,815	5,699	3,830	15,655	0.7557	0.7829	0.7080	0.7436
	GBDT	15,716	3,798	3,460	16,025	0.8139	0.8196	0.8054	0.8124
	ABT	14,738	4,776	3,752	15,733	0.7813	0.7971	0.7553	0.7756
	SVM	13,623	5,891	3,982	15,503	0.7468	0.7738	0.6981	0.7340
1:99	MLP	15,736	3,778	3,881	15,604	0.8036	0.8022	0.8064	0.8043
	KNN	15,213	4,301	6,277	13,208	0.7288	0.7079	0.7796	0.7420
	GNB	19,377	137	17,452	2,033	0.5490	0.5261	0.9930	0.6878
	LRC	14,504	5,010	3,957	15,528	0.7701	0.7857	0.7433	0.7639
	QDA	0	19,514	99	19,386	0.4971	0.0000	0.0000	NaN

Table 20 ML Models performance for Disjoint Set (Fixed Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	10,252	131	235	10,155	0.9824	0.9776	0.9874	0.9825
	RFT	10,268	115	440	9,950	0.9733	0.9589	0.9889	0.9737
	GBDT	9,751	632	1,554	8,836	0.8948	0.8625	0.9391	0.8992
	ABT	8,045	2,338	2,146	8,244	0.7841	0.7894	0.7748	0.7821
	SVM	10,299	84	1,051	9,339	0.9454	0.9074	0.9919	0.9478
75:25	MLP	10,377	6	29	10,361	0.9983	0.9972	0.9994	0.9983
	KNN	10,320	63	2,101	8,289	0.8958	0.8309	0.9939	0.9051
	GNB	7,576	2,807	4,257	6,133	0.6599	0.6402	0.7297	0.6820
	LRC	8,010	2,373	2,740	7,650	0.7539	0.7451	0.7715	0.7581
	QDA	10,191	192	9,523	867	0.5323	0.5169	0.9815	0.6772
	DT	20,443	331	596	20,176	0.9777	0.9717	0.9841	0.9778
	RFT	20,405	369	1,150	19,622	0.9634	0.9466	0.9822	0.9641
	GBDT	19,470	1,304	3,029	17,743	0.8957	0.8654	0.9372	0.8999
	ABT	16,067	4,707	4,248	16,524	0.7845	0.7909	0.7734	0.7821
	SVM	20,547	227	2,296	18,476	0.9393	0.8995	0.9891	0.9422
50:50	MLP	20,752	22	104	20,668	0.9970	0.9950	0.9989	0.9970
	KNN	20,596	178	4,543	16,229	0.8864	0.8193	0.9914	0.8972
	GNB	4	20,770	13	20,759	0.4998	0.2353	0.0002	0.0004
	LRC	16,082	4,692	5,450	15,322	0.7559	0.7469	0.7741	0.7603
	QDA	316	20,458	180	20,592	0.5032	0.6371	0.0152	0.0297
	DT	30,063	1,142	1,674	29,440	0.9548	0.9473	0.9634	0.9553
	RFT	30,158	1,047	2,202	28,912	0.9479	0.9320	0.9664	0.9489
	GBDT	29,056	2,149	4,600	26,514	0.8917	0.8633	0.9311	0.8959
	ABT	24,094	7,111	6,350	24,764	0.7840	0.7914	0.7721	0.7817
	SVM	30,603	602	4,085	27,029	0.9248	0.8822	0.9807	0.9289
25:75	MLP	31,185	20	400	30,714	0.9933	0.9873	0.9994	0.9933
	KNN	30,655	550	7,993	23,121	0.8629	0.7932	0.9824	0.8777
	GNB	18,377	12,828	7,196	23,918	0.6787	0.7186	0.5889	0.6473
	LRC	24,214	6,991	8,204	22,910	0.7562	0.7469	0.7760	0.7612
	QDA	20,585	10,620	8,841	22,273	0.6877	0.6996	0.6597	0.6790
	DT	34,797	2,691	3,108	34,187	0.9225	0.9180	0.9282	0.9231
	RFT	34,276	3,212	3,556	33,739	0.9095	0.9060	0.9143	0.9101
	GBDT	34,964	2,524	5,411	31,884	0.8939	0.8660	0.9327	0.8981
	ABT	28,778	8,710	7,333	29,962	0.7855	0.7969	0.7677	0.7820
	SVM	35,688	1,800	5,564	31,731	0.9015	0.8651	0.9520	0.9065
10:90	MLP	36,816	672	567	36,728	0.9834	0.9848	0.9821	0.9835
	KNN	35,788	1,700	10,165	27,130	0.8413	0.7788	0.9547	0.8578
	GNB	9	37,479	17	37,278	0.4986	0.3462	0.0002	0.0005
	LRC	28,566	8,922	9,456	27,839	0.7542	0.7513	0.7620	0.7566
	QDA	3,506	33,982	2,253	35,042	0.5155	0.6088	0.0935	0.1621
	DT	31,923	9,215	9,542	31,582	0.7720	0.7699	0.7760	0.7729
	RFT	31,703	9,435	6,989	34,135	0.8003	0.8194	0.7707	0.7943
	GBDT	36,581	4,557	7,194	33,930	0.8572	0.8357	0.8892	0.8616
	ABT	30,899	10,239	8,259	32,865	0.7751	0.7891	0.7511	0.7696
	SVM	36,605	4,533	10,071	31,053	0.8225	0.7842	0.8898	0.8337
1:99	MLP	36,388	4,750	5,733	35,391	0.8726	0.8639	0.8845	0.8741
	KNN	34,723	6,415	14,070	27,054	0.7510	0.7116	0.8441	0.7722
	GNB	511	40,627	335	40,789	0.5021	0.6040	0.0124	0.0243
	LRC	30,804	10,334	10,782	30,342	0.7433	0.7407	0.7488	0.7447
	QDA	798	40,340	258	40,866	0.5065	0.7557	0.0194	0.0378

Table 21 ML Models performance for Fibonacci Heap (Fixed Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	13,023	30	48	13,040	0.9970	0.9963	0.9977	0.9970
	RFT	12,810	243	269	12,819	0.9804	0.9794	0.9814	0.9804
	GBDT	12,338	715	1,378	11,710	0.9199	0.8995	0.9452	0.9218
	ABT	10,637	2,416	2,746	10,342	0.8025	0.7948	0.8149	0.8047
	SVM	12,569	484	1,592	11,496	0.9206	0.8876	0.9629	0.9237
75:25	MLP	13,040	13	42	13,046	0.9979	0.9968	0.9990	0.9979
	KNN	12,932	121	1,448	11,640	0.9400	0.8993	0.9907	0.9428
	GNB	13,053	0	12,378	710	0.5265	0.5133	1.0000	0.6784
	LRC	10,627	2,426	2,997	10,091	0.7925	0.7800	0.8141	0.7967
	QDA	13,049	4	11,248	1,840	0.5696	0.5371	0.9997	0.6987
	DT	26,018	104	133	26,026	0.9955	0.9949	0.9960	0.9955
	RFT	25,301	821	782	25,377	0.9693	0.9700	0.9686	0.9693
	GBDT	24,583	1,539	2,567	23,592	0.9215	0.9055	0.9411	0.9229
	ABT	21,140	4,982	5,550	20,609	0.7986	0.7921	0.8093	0.8006
	SVM	24,866	1,256	3,398	22,761	0.9110	0.8798	0.9519	0.9144
50:50	MLP	26,067	55	111	26,048	0.9968	0.9958	0.9979	0.9968
	KNN	25,605	517	3,575	22,584	0.9217	0.8775	0.9802	0.9260
	GNB	26,122	0	24,716	1,443	0.5272	0.5138	1.0000	0.6788
	LRC	21,242	4,880	6,001	20,158	0.7919	0.7797	0.8132	0.7961
	QDA	26,120	2	22,501	3,658	0.5696	0.5372	0.9999	0.6989
	DT	38,869	400	355	38,798	0.9904	0.9909	0.9898	0.9904
	RFT	37,010	2,259	1,774	37,379	0.9486	0.9543	0.9425	0.9483
	GBDT	36,853	2,416	4,020	35,133	0.9179	0.9016	0.9385	0.9197
	ABT	31,771	7,498	8,143	31,010	0.8006	0.7960	0.8091	0.8025
	SVM	36,734	2,535	6,067	33,086	0.8903	0.8583	0.9354	0.8952
25:75	MLP	39,115	154	477	38,676	0.9920	0.9880	0.9961	0.9920
	KNN	37,485	1,784	6,633	32,520	0.8927	0.8497	0.9546	0.8991
	GNB	39,268	1	37,055	2,098	0.5275	0.5145	1.0000	0.6794
	LRC	31,816	7,453	8,960	30,193	0.7907	0.7803	0.8102	0.7950
	QDA	39,175	94	33,541	5,612	0.5711	0.5387	0.9976	0.6996
	DT	46,282	868	924	46,032	0.9810	0.9804	0.9816	0.9810
	RFT	42,540	4,610	3,661	43,295	0.9121	0.9208	0.9022	0.9114
	GBDT	44,450	2,700	4,681	42,275	0.9216	0.9047	0.9427	0.9233
	ABT	38,065	9,085	9,661	37,295	0.8008	0.7976	0.8073	0.8024
	SVM	42,571	4,579	8,597	38,359	0.8600	0.8320	0.9029	0.8660
10:90	MLP	46,398	752	1,655	45,301	0.9744	0.9656	0.9841	0.9747
	KNN	43,551	3,599	9,679	37,277	0.8589	0.8182	0.9237	0.8677
	GNB	47,149	1	44,481	2,475	0.5273	0.5146	1.0000	0.6795
	LRC	37,830	9,320	10,481	36,475	0.7896	0.7831	0.8023	0.7926
	QDA	47,144	6	40,388	6,568	0.5708	0.5386	0.9999	0.7001
	DT	46,789	4,974	5,917	45,837	0.8948	0.8877	0.9039	0.8957
	RFT	37,263	14,500	10,972	40,782	0.7539	0.7725	0.7199	0.7453
	GBDT	48,508	3,255	6,469	45,285	0.9061	0.8823	0.9371	0.9089
	ABT	41,343	10,420	12,410	39,344	0.7795	0.7691	0.7987	0.7836
	SVM	43,267	8,496	13,088	38,666	0.7915	0.7678	0.8359	0.8004
1:99	MLP	46,160	5,603	7,122	44,632	0.8771	0.8663	0.8918	0.8789
	KNN	41,929	9,834	15,245	36,509	0.7577	0.7334	0.8100	0.7698
	GNB	51,762	1	46,067	5,687	0.5550	0.5291	1.0000	0.6920
	LRC	41,048	10,715	13,138	38,616	0.7696	0.7575	0.7930	0.7749
	QDA	34,895	16,868	28,615	23,139	0.5606	0.5494	0.6741	0.6054

Table 22 ML Models performance for Heap Array (Fixed Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	3,273	0	7	3,290	0.9989	0.9979	1.0000	0.9989
	RFT	3,268	5	15	3,282	0.9970	0.9954	0.9985	0.9969
	GBDT	3,273	0	158	3,139	0.9760	0.9539	1.0000	0.9764
	ABT	2,601	672	831	2,466	0.7712	0.7579	0.7947	0.7758
	SVM	3,263	10	244	3,053	0.9613	0.9304	0.9969	0.9625
75:25	MLP	3,269	4	13	3,284	0.9974	0.9960	0.9988	0.9974
	KNN	3,262	11	655	2,642	0.8986	0.8328	0.9966	0.9074
	GNB	2,670	603	1,263	2,034	0.7160	0.6789	0.8158	0.7410
	LRC	2,783	490	858	2,439	0.7948	0.7644	0.8503	0.8050
	QDA	413	2,860	157	3,140	0.5408	0.7246	0.1262	0.2149
	DT	6,532	1	8	6,598	0.9993	0.9988	0.9998	0.9993
	RFT	6,492	41	54	6,552	0.9928	0.9918	0.9937	0.9927
	GBDT	6,531	2	295	6,311	0.9774	0.9568	0.9997	0.9778
	ABT	5,125	1,408	1,692	4,914	0.7641	0.7518	0.7845	0.7678
	SVM	6,506	27	619	5,987	0.9508	0.9131	0.9959	0.9527
50:50	MLP	6,527	6	64	6,542	0.9947	0.9903	0.9991	0.9947
	KNN	6,445	88	1,564	5,042	0.8743	0.8047	0.9865	0.8864
	GNB	5,302	1,231	2,459	4,147	0.7192	0.6832	0.8116	0.7418
	LRC	5,510	1,023	1,690	4,916	0.7935	0.7653	0.8434	0.8024
	QDA	6,081	452	6,019	587	0.5075	0.5026	0.9308	0.6527
	DT	9,777	28	32	9,872	0.9970	0.9967	0.9971	0.9969
	RFT	9,681	124	120	9,784	0.9876	0.9878	0.9874	0.9876
	GBDT	9,804	1	476	9,428	0.9758	0.9537	0.9999	0.9763
	ABT	7,563	2,242	2,526	7,378	0.7581	0.7496	0.7713	0.7603
	SVM	9,685	120	1,174	8,730	0.9343	0.8919	0.9878	0.9374
25:75	MLP	9,754	51	579	9,325	0.9680	0.9440	0.9948	0.9687
	KNN	9,530	275	2,739	7,165	0.8471	0.7768	0.9720	0.8635
	GNB	7,921	1,884	3,664	6,240	0.7185	0.6837	0.8079	0.7406
	LRC	8,210	1,595	2,537	7,367	0.7903	0.7639	0.8373	0.7989
	QDA	1,202	8,603	926	8,978	0.5165	0.5648	0.1226	0.2015
	DT	11,558	259	240	11,594	0.9789	0.9797	0.9781	0.9789
	RFT	11,427	390	284	11,550	0.9715	0.9757	0.9670	0.9714
	GBDT	11,791	26	570	11,264	0.9748	0.9539	0.9978	0.9753
	ABT	9,150	2,667	2,991	8,843	0.7608	0.7536	0.7743	0.7638
	SVM	11,410	407	1,806	10,028	0.9064	0.8633	0.9656	0.9116
10:90	MLP	11,457	360	1,408	10,426	0.9252	0.8906	0.9695	0.9284
	KNN	11,217	600	3,760	8,074	0.8157	0.7489	0.9492	0.8373
	GNB	9,563	2,254	4,256	7,578	0.7247	0.6920	0.8093	0.7461
	LRC	9,809	2,008	3,028	8,806	0.7871	0.7641	0.8301	0.7957
	QDA	10,982	835	10,181	1,653	0.5342	0.5189	0.9293	0.6660
	DT	11,614	1,390	1,645	11,367	0.8833	0.8759	0.8931	0.8844
	RFT	10,709	2,295	1,902	11,110	0.8387	0.8492	0.8235	0.8362
	GBDT	12,024	980	1,351	11,661	0.9104	0.8990	0.9246	0.9116
	ABT	10,140	2,864	3,648	9,364	0.7497	0.7354	0.7798	0.7569
	SVM	10,905	2,099	3,134	9,878	0.7989	0.7768	0.8386	0.8065
1:99	MLP	11,241	1,763	3,112	9,900	0.8126	0.7832	0.8644	0.8218
	KNN	10,806	2,198	5,249	7,763	0.7138	0.6731	0.8310	0.7437
	GNB	9,873	3,131	4,812	8,200	0.6947	0.6723	0.7592	0.7131
	LRC	10,495	2,509	3,459	9,553	0.7706	0.7521	0.8071	0.7786
	QDA	5,956	7,048	4,632	8,380	0.5510	0.5625	0.4580	0.5049

Table 23 ML Models performance for Red-Black Tree (Fixed Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	4,288	0	6	4,286	0.9993	0.9986	1.0000	0.9993
	RFT	4,288	0	27	4,265	0.9969	0.9937	1.0000	0.9969
	GBDT	4,288	0	19	4,273	0.9978	0.9956	1.0000	0.9978
	ABT	4,287	1	32	4,260	0.9962	0.9926	0.9998	0.9962
	SVM	4,288	0	51	4,241	0.9941	0.9882	1.0000	0.9941
75:25	MLP	4,286	2	2	4,290	0.9995	0.9995	0.9995	0.9995
	KNN	4,288	0	39	4,253	0.9955	0.9910	1.0000	0.9955
	GNB	4,288	0	1,717	2,575	0.7999	0.7141	1.0000	0.8332
	LRC	4,286	2	38	4,254	0.9953	0.9912	0.9995	0.9954
	QDA	4,288	0	1,696	2,596	0.8023	0.7166	1.0000	0.8349
	DT	8,573	0	17	8,570	0.9990	0.9980	1.0000	0.9990
	RFT	8,572	1	84	8,503	0.9950	0.9903	0.9999	0.9951
	GBDT	8,573	0	36	8,551	0.9979	0.9958	1.0000	0.9979
	ABT	8,573	0	66	8,521	0.9962	0.9924	1.0000	0.9962
	SVM	8,573	0	107	8,480	0.9938	0.9877	1.0000	0.9938
50:50	MLP	8,573	0	28	8,559	0.9984	0.9967	1.0000	0.9984
	KNN	8,573	0	88	8,499	0.9949	0.9898	1.0000	0.9949
	GNB	8,573	0	3,401	5,186	0.8018	0.7160	1.0000	0.8345
	LRC	8,570	3	80	8,507	0.9952	0.9908	0.9997	0.9952
	QDA	8,573	0	3,359	5,228	0.8043	0.7185	1.0000	0.8362
	DT	12,849	12	27	12,852	0.9985	0.9979	0.9991	0.9985
	RFT	12,853	8	137	12,742	0.9944	0.9895	0.9994	0.9944
	GBDT	12,861	0	60	12,819	0.9977	0.9954	1.0000	0.9977
	ABT	12,861	0	118	12,761	0.9954	0.9909	1.0000	0.9954
	SVM	12,861	0	178	12,701	0.9931	0.9863	1.0000	0.9931
25:75	MLP	12,855	6	43	12,836	0.9981	0.9967	0.9995	0.9981
	KNN	12,861	0	170	12,709	0.9934	0.9870	1.0000	0.9934
	GNB	12,861	0	5,142	7,737	0.8002	0.7144	1.0000	0.8334
	LRC	12,856	5	145	12,734	0.9942	0.9888	0.9996	0.9942
	QDA	12,861	0	5,078	7,801	0.8027	0.7169	1.0000	0.8351
	DT	15,409	12	70	15,397	0.9973	0.9955	0.9992	0.9973
	RFT	15,417	4	270	15,197	0.9911	0.9828	0.9997	0.9912
	GBDT	15,421	0	86	15,381	0.9972	0.9945	1.0000	0.9972
	ABT	15,418	3	147	15,320	0.9951	0.9906	0.9998	0.9952
	SVM	15,377	44	235	15,232	0.9910	0.9849	0.9971	0.9910
10:90	MLP	15,421	0	113	15,354	0.9963	0.9927	1.0000	0.9963
	KNN	15,421	0	217	15,250	0.9930	0.9861	1.0000	0.9930
	GNB	15,358	63	6,168	9,299	0.7983	0.7135	0.9959	0.8314
	LRC	15,411	10	181	15,286	0.9938	0.9884	0.9994	0.9938
	QDA	15,421	0	6,124	9,343	0.8017	0.7158	1.0000	0.8343
	DT	16,819	179	340	16,639	0.9847	0.9802	0.9895	0.9848
	RFT	16,854	144	578	16,401	0.9788	0.9668	0.9915	0.9790
	GBDT	16,888	110	335	16,644	0.9869	0.9805	0.9935	0.9870
	ABT	16,780	218	361	16,618	0.9830	0.9789	0.9872	0.9830
	SVM	16,867	131	607	16,372	0.9783	0.9653	0.9923	0.9786
1:99	MLP	16,998	0	316	16,663	0.9907	0.9817	1.0000	0.9908
	KNN	16,867	131	597	16,382	0.9786	0.9658	0.9923	0.9789
	GNB	16,998	0	6,829	10,150	0.7990	0.7134	1.0000	0.8327
	LRC	16,971	27	319	16,660	0.9898	0.9816	0.9984	0.9899
	QDA	16,932	66	4,939	12,040	0.8527	0.7742	0.9961	0.8712

Table 24 ML Models performance for Sorted List (Fixed Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	3,198	0	0	3,237	1.0000	1.0000	1.0000	1.0000
	RFT	3,194	4	35	3,202	0.9939	0.9892	0.9987	0.9939
	GBDT	3,198	0	1	3,236	0.9998	0.9997	1.0000	0.9998
	ABT	3,198	0	0	3,237	1.0000	1.0000	1.0000	1.0000
	SVM	3,198	0	0	3,237	1.0000	1.0000	1.0000	1.0000
75:25	MLP	3,198	0	0	3,237	1.0000	1.0000	1.0000	1.0000
	KNN	3,197	1	178	3,059	0.9722	0.9473	0.9997	0.9728
	GNB	3,198	0	3,236	1	0.4971	0.4970	1.0000	0.6640
	LRC	3,196	2	0	3,237	0.9997	1.0000	0.9994	0.9997
	QDA	3,198	0	3,236	1	0.4971	0.4970	1.0000	0.6640
	DT	6,388	0	0	6,482	1.0000	1.0000	1.0000	1.0000
	RFT	6,383	5	51	6,431	0.9956	0.9921	0.9992	0.9956
	GBDT	6,388	0	6	6,476	0.9995	0.9991	1.0000	0.9995
	ABT	6,388	0	0	6,482	1.0000	1.0000	1.0000	1.0000
	SVM	6,388	0	0	6,482	1.0000	1.0000	1.0000	1.0000
50:50	MLP	6,388	0	0	6,482	1.0000	1.0000	1.0000	1.0000
	KNN	6,388	0	359	6,123	0.9721	0.9468	1.0000	0.9727
	GNB	6,388	0	6,474	8	0.4970	0.4967	1.0000	0.6637
	LRC	6,386	2	0	6,482	0.9998	1.0000	0.9997	0.9998
	QDA	6,388	0	6,120	362	0.5245	0.5107	1.0000	0.6761
	DT	9,599	6	8	9,692	0.9993	0.9992	0.9994	0.9993
	RFT	9,518	87	237	9,463	0.9832	0.9757	0.9909	0.9833
	GBDT	9,600	5	6	9,694	0.9994	0.9994	0.9995	0.9994
	ABT	9,604	1	9	9,691	0.9995	0.9991	0.9999	0.9995
	SVM	9,604	1	64	9,636	0.9966	0.9934	0.9999	0.9966
25:75	MLP	9,604	1	0	9,700	0.9999	1.0000	0.9999	0.9999
	KNN	9,601	4	618	9,082	0.9678	0.9395	0.9996	0.9686
	GNB	9,605	0	9,683	17	0.4984	0.4980	1.0000	0.6649
	LRC	9,597	8	0	9,700	0.9996	1.0000	0.9992	0.9996
	QDA	9,550	55	7,306	2,394	0.6187	0.5666	0.9943	0.7218
	DT	11,568	9	7	11,582	0.9993	0.9994	0.9992	0.9993
	RFT	11,449	128	281	11,308	0.9823	0.9760	0.9889	0.9825
	GBDT	11,568	9	7	11,582	0.9993	0.9994	0.9992	0.9993
	ABT	11,568	9	7	11,582	0.9993	0.9994	0.9992	0.9993
	SVM	11,569	8	625	10,964	0.9727	0.9487	0.9993	0.9734
10:90	MLP	11,576	1	0	11,589	1.0000	1.0000	0.9999	1.0000
	KNN	11,545	32	801	10,788	0.9640	0.9351	0.9972	0.9652
	GNB	11,577	0	11,566	23	0.5007	0.5002	1.0000	0.6669
	LRC	11,569	8	22	11,567	0.9987	0.9981	0.9993	0.9987
	QDA	11,374	203	3,537	8,052	0.8386	0.7628	0.9825	0.8588
	DT	12,573	165	324	12,421	0.9808	0.9749	0.9870	0.9809
	RFT	12,319	419	1,060	11,685	0.9420	0.9208	0.9671	0.9434
	GBDT	12,573	165	324	12,421	0.9808	0.9749	0.9870	0.9809
	ABT	12,573	165	324	12,421	0.9808	0.9749	0.9870	0.9809
	SVM	12,693	45	1,364	11,381	0.9447	0.9030	0.9965	0.9474
1:99	MLP	12,590	148	672	12,073	0.9678	0.9493	0.9884	0.9685
	KNN	12,696	42	1,382	11,363	0.9441	0.9018	0.9967	0.9469
	GNB	12,692	46	4,466	8,279	0.8229	0.7397	0.9964	0.8491
	LRC	12,689	49	535	12,210	0.9771	0.9595	0.9962	0.9775
	QDA	12,408	330	6,505	6,240	0.7318	0.6561	0.9741	0.7841

Table 25 ML Models performance for Singly Linked List (Fixed Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	5,261	0	0	5,313	1.0000	1.0000	1.0000	1.0000
	RFT	5,261	0	0	5,313	1.0000	1.0000	1.0000	1.0000
	GBDT	5,261	0	0	5,313	1.0000	1.0000	1.0000	1.0000
	ABT	5,261	0	0	5,313	1.0000	1.0000	1.0000	1.0000
	SVM	5,261	0	70	5,243	0.9934	0.9869	1.0000	0.9934
75:25	MLP	5,261	0	0	5,313	1.0000	1.0000	1.0000	1.0000
	KNN	5,226	35	3,588	1,725	0.6574	0.5929	0.9933	0.7426
	GNB	5,261	0	70	5,243	0.9934	0.9869	1.0000	0.9934
	LRC	5,261	0	70	5,243	0.9934	0.9869	1.0000	0.9934
	QDA	5,259	2	70	5,243	0.9932	0.9869	0.9996	0.9932
	DT	10,572	0	0	10,575	1.0000	1.0000	1.0000	1.0000
	RFT	10,571	1	0	10,575	1.0000	1.0000	0.9999	1.0000
	GBDT	10,572	0	0	10,575	1.0000	1.0000	1.0000	1.0000
	ABT	10,572	0	0	10,575	1.0000	1.0000	1.0000	1.0000
	SVM	10,572	0	154	10,421	0.9927	0.9856	1.0000	0.9928
50:50	MLP	10,572	0	0	10,575	1.0000	1.0000	1.0000	1.0000
	KNN	10,459	113	7,325	3,250	0.6483	0.5881	0.9893	0.7377
	GNB	10,572	0	154	10,421	0.9927	0.9856	1.0000	0.9928
	LRC	10,572	0	154	10,421	0.9927	0.9856	1.0000	0.9928
	QDA	10,572	0	154	10,421	0.9927	0.9856	1.0000	0.9928
	DT	15,884	0	0	15,837	1.0000	1.0000	1.0000	1.0000
	RFT	15,884	0	0	15,837	1.0000	1.0000	1.0000	1.0000
	GBDT	15,884	0	0	15,837	1.0000	1.0000	1.0000	1.0000
	ABT	15,884	0	0	15,837	1.0000	1.0000	1.0000	1.0000
	SVM	15,884	0	233	15,604	0.9927	0.9855	1.0000	0.9927
25:75	MLP	15,884	0	0	15,837	1.0000	1.0000	1.0000	1.0000
	KNN	15,456	428	10,972	4,865	0.6406	0.5848	0.9731	0.7306
	GNB	15,884	0	233	15,604	0.9927	0.9855	1.0000	0.9927
	LRC	15,884	0	233	15,604	0.9927	0.9855	1.0000	0.9927
	QDA	15,884	0	233	15,604	0.9927	0.9855	1.0000	0.9927
	DT	19,015	0	0	19,050	1.0000	1.0000	1.0000	1.0000
	RFT	19,014	1	2	19,048	0.9999	0.9999	0.9999	0.9999
	GBDT	19,015	0	0	19,050	1.0000	1.0000	1.0000	1.0000
	ABT	19,015	0	0	19,050	1.0000	1.0000	1.0000	1.0000
	SVM	19,015	0	278	18,772	0.9927	0.9856	1.0000	0.9927
10:90	MLP	19,015	0	0	19,050	1.0000	1.0000	1.0000	1.0000
	KNN	17,941	1,074	13,250	5,800	0.6237	0.5752	0.9435	0.7147
	GNB	19,015	0	278	18,772	0.9927	0.9856	1.0000	0.9927
	LRC	19,015	0	278	18,772	0.9927	0.9856	1.0000	0.9927
	QDA	19,015	0	278	18,772	0.9927	0.9856	1.0000	0.9927
	DT	20,947	0	0	20,925	1.0000	1.0000	1.0000	1.0000
	RFT	20,791	156	152	20,773	0.9926	0.9927	0.9926	0.9926
	GBDT	20,947	0	0	20,925	1.0000	1.0000	1.0000	1.0000
	ABT	20,947	0	0	20,925	1.0000	1.0000	1.0000	1.0000
	SVM	14,689	6,258	8,867	12,058	0.6388	0.6236	0.7012	0.6601
1:99	MLP	20,947	0	305	20,620	0.9927	0.9856	1.0000	0.9928
	KNN	16,290	4,657	12,562	8,363	0.5888	0.5646	0.7777	0.6542
	GNB	20,947	0	305	20,620	0.9927	0.9856	1.0000	0.9928
	LRC	20,947	0	305	20,620	0.9927	0.9856	1.0000	0.9928
	QDA	20,947	0	306	20,619	0.9927	0.9856	1.0000	0.9927

Table 26 ML Models performance for Binary Search Tree (Upto Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	55,584	276	879	54,857	0.9897	0.9844	0.9951	0.9897
	RBT	55,654	206	1,346	54,390	0.9861	0.9764	0.9963	0.9862
	GBDT	55,564	296	2,398	53,338	0.9759	0.9586	0.9947	0.9763
	ABT	55,610	250	2,965	52,771	0.9712	0.9494	0.9955	0.9719
	SVM	55,856	4	1,580	54,156	0.9858	0.9725	0.9999	0.9860
75:25	MLP	55,832	28	360	55,376	0.9965	0.9936	0.9995	0.9965
	KNN	55,857	3	4,851	50,885	0.9565	0.9201	0.9999	0.9584
	GNB	55,712	148	54,541	1,195	0.5099	0.5053	0.9974	0.6708
	LRC	54,248	1,612	4,354	51,382	0.9465	0.9257	0.9711	0.9479
	QDA	55,841	19	55,324	412	0.5041	0.5023	0.9997	0.6687
	DT	110,674	996	1,997	109,524	0.9866	0.9823	0.9911	0.9867
	RBT	111,073	597	2,846	108,675	0.9846	0.9750	0.9947	0.9847
	GBDT	111,166	504	4,727	106,794	0.9766	0.9592	0.9955	0.9770
	ABT	111,079	591	5,880	105,641	0.9710	0.9497	0.9947	0.9717
	SVM	111,662	8	3,367	108,154	0.9849	0.9707	0.9999	0.9851
50:50	MLP	111,647	23	820	110,701	0.9962	0.9927	0.9998	0.9962
	KNN	111,658	12	10,723	100,798	0.9519	0.9124	0.9999	0.9541
	GNB	111,388	282	109,167	2,354	0.5096	0.5050	0.9975	0.6706
	LRC	108,529	3,141	8,671	102,850	0.9471	0.9260	0.9719	0.9484
	QDA	111,647	23	110,753	768	0.5037	0.5020	0.9998	0.6684
	DT	165,629	1,841	3,402	163,915	0.9843	0.9799	0.9890	0.9844
	RBT	166,214	1,256	5,026	162,291	0.9812	0.9706	0.9925	0.9815
	GBDT	166,697	773	6,810	160,507	0.9773	0.9608	0.9954	0.9778
	ABT	166,626	844	8,496	158,821	0.9721	0.9515	0.9950	0.9727
	SVM	167,432	38	5,884	161,433	0.9823	0.9661	0.9998	0.9826
25:75	MLP	167,057	413	1,704	165,613	0.9937	0.9899	0.9975	0.9937
	KNN	167,397	73	18,359	148,958	0.9449	0.9012	0.9996	0.9478
	GNB	166,892	578	161,904	5,413	0.5147	0.5076	0.9965	0.6726
	LRC	162,729	4,741	12,896	154,421	0.9473	0.9266	0.9717	0.9486
	QDA	167,420	50	166,003	1,314	0.5040	0.5021	0.9997	0.6685
	DT	197,165	3,780	5,391	195,408	0.9772	0.9734	0.9812	0.9773
	RBT	197,196	3,749	7,345	193,454	0.9724	0.9641	0.9813	0.9726
	GBDT	199,939	1,006	8,275	192,524	0.9769	0.9603	0.9950	0.9773
	ABT	199,679	1,266	10,335	190,464	0.9711	0.9508	0.9937	0.9718
	SVM	200,866	79	9,162	191,637	0.9770	0.9564	0.9996	0.9775
10:90	MLP	200,670	275	3,786	197,013	0.9899	0.9815	0.9986	0.9900
	KNN	200,620	325	25,853	174,946	0.9348	0.8858	0.9984	0.9388
	GNB	200,035	910	193,196	7,603	0.5168	0.5087	0.9955	0.6733
	LRC	195,519	5,426	15,768	185,031	0.9472	0.9254	0.9730	0.9486
	QDA	200,883	62	199,219	1,580	0.5040	0.5021	0.9997	0.6684
	DT	210,862	10,172	11,188	209,697	0.9517	0.9496	0.9540	0.9518
	RBT	209,444	11,590	12,999	207,886	0.9444	0.9416	0.9476	0.9446
	GBDT	219,719	1,315	10,690	210,195	0.9728	0.9536	0.9941	0.9734
	ABT	219,105	1,929	11,298	209,587	0.9701	0.9510	0.9913	0.9707
	SVM	220,969	65	18,789	202,096	0.9573	0.9216	0.9997	0.9591
1:99	MLP	218,045	2,989	9,285	211,600	0.9722	0.9592	0.9865	0.9726
	KNN	217,780	3,254	40,515	180,370	0.9010	0.8431	0.9853	0.9087
	GNB	214,272	6,762	173,706	47,179	0.5916	0.5523	0.9694	0.7037
	LRC	215,958	5,076	18,618	202,267	0.9464	0.9206	0.9770	0.9480
	QDA	220,000	1,034	130,880	90,005	0.7015	0.6270	0.9953	0.7693

Table 27 ML Models performance for Binary Tree (Upto Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	3,812	2,122	1,190	4,733	0.7207	0.7621	0.6424	0.6971
	RBT	4,917	1,017	1,455	4,468	0.7915	0.7717	0.8286	0.7991
	GBDT	5,934	0	2,095	3,828	0.8233	0.7391	1.0000	0.8500
	ABT	5,934	0	2,095	3,828	0.8233	0.7391	1.0000	0.8500
	SVM	5,934	0	1,954	3,969	0.8352	0.7523	1.0000	0.8586
75:25	MLP	5,849	85	1,383	4,540	0.8762	0.8088	0.9857	0.8885
	KNN	4,844	1,090	4,731	1,192	0.5091	0.5059	0.8163	0.6247
	GNB	5,934	0	1,658	4,265	0.8602	0.7816	1.0000	0.8774
	LRC	5,933	1	1,657	4,266	0.8602	0.7817	0.9998	0.8774
	QDA	5,934	0	1,658	4,265	0.8602	0.7816	1.0000	0.8774
	DT	8,257	3,655	2,349	9,453	0.7468	0.7785	0.6932	0.7334
	RBT	10,210	1,702	2,852	8,950	0.8080	0.7817	0.8571	0.8177
	GBDT	11,912	0	4,149	7,653	0.8250	0.7417	1.0000	0.8517
	ABT	11,912	0	4,149	7,653	0.8250	0.7417	1.0000	0.8517
	SVM	11,912	0	4,126	7,676	0.8260	0.7427	1.0000	0.8524
50:50	MLP	11,504	408	2,759	9,043	0.8665	0.8066	0.9657	0.8790
	KNN	10,150	1,762	9,917	1,885	0.5075	0.5058	0.8521	0.6348
	GNB	11,912	0	3,282	8,520	0.8616	0.7840	1.0000	0.8789
	LRC	11,912	0	3,286	8,516	0.8614	0.7838	1.0000	0.8788
	QDA	11,912	0	3,283	8,519	0.8616	0.7839	1.0000	0.8789
	DT	12,906	4,936	3,499	14,230	0.7629	0.7867	0.7233	0.7537
	RBT	15,373	2,469	4,334	13,395	0.8087	0.7801	0.8616	0.8188
	GBDT	17,842	0	6,037	11,692	0.8303	0.7472	1.0000	0.8553
	ABT	17,842	0	6,137	11,592	0.8275	0.7441	1.0000	0.8533
	SVM	13,580	4,262	8,021	9,708	0.6547	0.6287	0.7611	0.6886
25:75	MLP	16,874	968	4,055	13,674	0.8588	0.8062	0.9457	0.8704
	KNN	14,959	2,883	14,798	2,931	0.5029	0.5027	0.8384	0.6285
	GNB	17,834	8	4,879	12,850	0.8626	0.7852	0.9996	0.8795
	LRC	17,837	5	4,944	12,785	0.8609	0.7830	0.9997	0.8782
	QDA	17,841	1	4,879	12,850	0.8628	0.7853	0.9999	0.8797
	DT	16,233	5,136	4,416	16,901	0.7762	0.7861	0.7597	0.7727
	RBT	18,169	3,200	5,388	15,929	0.7988	0.7713	0.8503	0.8088
	GBDT	21,369	0	7,449	13,868	0.8255	0.7415	1.0000	0.8516
	ABT	21,369	0	7,421	13,896	0.8261	0.7422	1.0000	0.8521
	SVM	11,275	10,094	6,553	14,764	0.6100	0.6324	0.5276	0.5753
10:90	MLP	19,521	1,848	5,246	16,071	0.8338	0.7882	0.9135	0.8462
	KNN	16,054	5,315	15,385	5,932	0.5151	0.5106	0.7513	0.6080
	GNB	21,361	8	5,935	15,382	0.8608	0.7826	0.9996	0.8779
	LRC	21,320	49	6,043	15,274	0.8573	0.7792	0.9977	0.8750
	QDA	21,347	22	5,930	15,387	0.8606	0.7826	0.9990	0.8776
	DT	14,182	9,315	10,777	12,680	0.5721	0.5682	0.6036	0.5854
	RBT	13,266	10,231	9,698	13,759	0.5756	0.5777	0.5646	0.5711
	GBDT	20,207	3,290	8,314	15,143	0.7529	0.7085	0.8600	0.7769
	ABT	20,832	2,665	9,495	13,962	0.7410	0.6869	0.8866	0.7741
	SVM	0	23,497	0	23,457	0.4996	0.0000	0.0000	NaN
1:99	MLP	19,364	4,133	6,698	16,759	0.7693	0.7430	0.8241	0.7815
	KNN	15,882	7,615	15,272	8,185	0.5126	0.5098	0.6759	0.5812
	GNB	23,290	207	7,770	15,687	0.8301	0.7498	0.9912	0.8538
	LRC	15,184	8,313	6,882	16,575	0.6764	0.6881	0.6462	0.6665
	QDA	23,299	198	7,816	15,641	0.8293	0.7488	0.9916	0.8533

Table 28 ML Models performance for Red Black Tree (Upto Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	34,498	8	71	34,296	0.9989	0.9979	0.9998	0.9989
	RBT	34,502	4	331	34,036	0.9951	0.9905	0.9999	0.9952
	GBDT	34,480	26	1,045	33,322	0.9844	0.9706	0.9992	0.9847
	ABT	34,329	177	1,746	32,621	0.9721	0.9516	0.9949	0.9728
	SVM	34,506	0	832	33,535	0.9879	0.9765	1.0000	0.9881
75:25	MLP	34,506	0	126	34,241	0.9982	0.9964	1.0000	0.9982
	KNN	34,506	0	1,149	33,218	0.9833	0.9678	1.0000	0.9836
	GNB	34,489	17	17,414	16,953	0.7469	0.6645	0.9995	0.7983
	LRC	34,383	123	1,452	32,915	0.9771	0.9595	0.9964	0.9776
	QDA	34,506	0	17,015	17,352	0.7530	0.6697	1.0000	0.8022
	DT	69,081	41	162	68,461	0.9985	0.9977	0.9994	0.9985
	RBT	69,097	25	841	67,782	0.9937	0.9880	0.9996	0.9938
	GBDT	69,052	70	2,033	66,590	0.9847	0.9714	0.9990	0.9850
	ABT	68,713	409	3,532	65,091	0.9714	0.9511	0.9941	0.9721
	SVM	69,122	0	1,877	66,746	0.9864	0.9736	1.0000	0.9866
50:50	MLP	69,121	1	409	68,214	0.9970	0.9941	1.0000	0.9970
	KNN	69,122	0	2,538	66,085	0.9816	0.9646	1.0000	0.9820
	GNB	69,089	33	34,807	33,816	0.7471	0.6650	0.9995	0.7986
	LRC	68,919	203	2,897	65,726	0.9775	0.9597	0.9971	0.9780
	QDA	69,122	0	34,027	34,596	0.7530	0.6701	1.0000	0.8025
	DT	103,380	135	471	102,632	0.9971	0.9955	0.9987	0.9971
	RBT	103,469	46	1,599	101,504	0.9920	0.9848	0.9996	0.9921
	GBDT	103,392	123	3,036	100,067	0.9847	0.9715	0.9988	0.9850
	ABT	102,992	523	5,399	97,704	0.9713	0.9502	0.9949	0.9721
	SVM	103,498	17	3,459	99,644	0.9832	0.9677	0.9998	0.9835
25:75	MLP	103,496	19	660	102,443	0.9967	0.9937	0.9998	0.9967
	KNN	103,515	0	4,508	98,595	0.9782	0.9583	1.0000	0.9787
	GNB	103,463	52	52,325	50,778	0.7465	0.6641	0.9995	0.7980
	LRC	103,247	268	4,388	98,715	0.9775	0.9592	0.9974	0.9779
	QDA	103,515	0	51,167	51,936	0.7524	0.6692	1.0000	0.8018
	DT	123,424	554	998	122,965	0.9937	0.9920	0.9955	0.9938
	RBT	123,845	133	2,931	121,032	0.9876	0.9769	0.9989	0.9878
	GBDT	123,843	135	4,082	119,881	0.9830	0.9681	0.9989	0.9833
	ABT	123,465	513	6,210	117,753	0.9729	0.9521	0.9959	0.9735
	SVM	123,931	47	5,440	118,523	0.9779	0.9580	0.9996	0.9783
10:90	MLP	123,888	90	1,235	122,728	0.9947	0.9901	0.9993	0.9947
	KNN	123,976	2	6,732	117,231	0.9728	0.9485	1.0000	0.9736
	GNB	123,918	60	62,775	61,188	0.7466	0.6638	0.9995	0.7977
	LRC	123,678	300	5,538	118,425	0.9765	0.9571	0.9976	0.9769
	QDA	123,978	0	61,361	62,602	0.7525	0.6689	1.0000	0.8016
	DT	135,482	876	3,893	132,485	0.9825	0.9721	0.9936	0.9827
	RBT	135,526	832	8,093	128,285	0.9673	0.9436	0.9939	0.9681
	GBDT	136,121	237	5,785	130,593	0.9779	0.9592	0.9983	0.9784
	ABT	135,464	894	7,824	128,554	0.9680	0.9454	0.9934	0.9688
	SVM	136,201	157	11,511	124,867	0.9572	0.9221	0.9988	0.9589
1:99	MLP	136,235	123	4,447	131,931	0.9832	0.9684	0.9991	0.9835
	KNN	136,287	71	12,787	123,591	0.9529	0.9142	0.9995	0.9550
	GNB	136,267	91	69,338	67,040	0.7454	0.6628	0.9993	0.7970
	LRC	136,145	213	8,065	128,313	0.9696	0.9441	0.9984	0.9705
	QDA	136,292	66	67,590	68,788	0.7519	0.6685	0.9995	0.8012

Table 29 ML Models performance for Sorted List (Upto Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	6,078	2	5	6,070	0.9994	0.9992	0.9997	0.9994
	RBT	6,068	12	63	6,012	0.9938	0.9897	0.9980	0.9939
	GBDT	6,051	29	193	5,882	0.9817	0.9691	0.9952	0.9820
	ABT	5,633	447	1,124	4,951	0.8708	0.8337	0.9265	0.8776
	SVM	6,077	3	248	5,827	0.9794	0.9608	0.9995	0.9798
75:25	MLP	6,080	0	7	6,068	0.9994	0.9989	1.0000	0.9994
	KNN	6,075	5	338	5,737	0.9718	0.9473	0.9992	0.9725
	GNB	6,080	0	6,074	1	0.5003	0.5002	1.0000	0.6669
	LRC	5,459	621	1,174	4,901	0.8523	0.8230	0.8979	0.8588
	QDA	6,080	0	6,067	8	0.5009	0.5005	1.0000	0.6671
	DT	12,213	9	21	12,067	0.9988	0.9983	0.9993	0.9988
	RBT	12,179	43	188	11,900	0.9905	0.9848	0.9965	0.9906
	GBDT	12,150	72	344	11,744	0.9829	0.9725	0.9941	0.9832
	ABT	10,580	1,642	2,221	9,867	0.8411	0.8265	0.8657	0.8456
	SVM	12,211	11	606	11,482	0.9746	0.9527	0.9991	0.9754
50:50	MLP	12,221	1	19	12,069	0.9992	0.9984	0.9999	0.9992
	KNN	12,213	9	735	11,353	0.9694	0.9432	0.9993	0.9704
	GNB	12,222	0	12,088	0	0.5028	0.5028	1.0000	0.6691
	LRC	11,009	1,213	2,344	9,744	0.8537	0.8245	0.9008	0.8609
	QDA	12,222	0	12,075	13	0.5033	0.5030	1.0000	0.6694
	DT	18,268	32	57	18,108	0.9976	0.9969	0.9983	0.9976
	RBT	18,109	191	425	17,740	0.9831	0.9771	0.9896	0.9833
	GBDT	18,168	132	568	17,597	0.9808	0.9697	0.9928	0.9811
	ABT	15,069	3,231	3,322	14,843	0.8203	0.8194	0.8234	0.8214
	SVM	18,278	22	1,266	16,899	0.9647	0.9352	0.9988	0.9660
25:75	MLP	18,299	1	9	18,156	0.9997	0.9995	0.9999	0.9997
	KNN	18,261	39	1,270	16,895	0.9641	0.9350	0.9979	0.9654
	GNB	18,300	0	18,164	1	0.5019	0.5019	1.0000	0.6683
	LRC	16,344	1,956	3,436	14,729	0.8521	0.8263	0.8931	0.8584
	QDA	18,292	8	18,143	22	0.5022	0.5020	0.9996	0.6684
	DT	21,827	90	85	21,756	0.9960	0.9961	0.9959	0.9960
	RBT	21,496	421	847	20,994	0.9710	0.9621	0.9808	0.9714
	GBDT	21,690	227	611	21,230	0.9808	0.9726	0.9896	0.9810
	ABT	18,641	3,276	3,829	18,012	0.8376	0.8296	0.8505	0.8399
	SVM	21,745	172	2,255	19,586	0.9445	0.9060	0.9922	0.9471
10:90	MLP	21,895	22	81	21,760	0.9976	0.9963	0.9990	0.9977
	KNN	21,804	113	1,811	20,030	0.9560	0.9233	0.9948	0.9577
	GNB	21,916	1	21,783	58	0.5022	0.5015	1.0000	0.6680
	LRC	19,601	2,316	4,144	17,697	0.8524	0.8255	0.8943	0.8585
	QDA	21,907	10	17,429	4,412	0.6015	0.5569	0.9995	0.7153
	DT	22,517	1,572	1,488	22,557	0.9364	0.9380	0.9347	0.9364
	RBT	21,037	3,052	1,468	22,577	0.9061	0.9348	0.8733	0.9030
	GBDT	23,153	936	754	23,291	0.9649	0.9685	0.9611	0.9648
	ABT	19,022	5,067	3,444	20,601	0.8232	0.8467	0.7897	0.8172
	SVM	20,175	3,914	2,800	21,245	0.8605	0.8781	0.8375	0.8573
1:99	MLP	23,429	660	1,474	22,571	0.9557	0.9408	0.9726	0.9564
	KNN	22,285	1,804	2,838	21,207	0.9036	0.8870	0.9251	0.9057
	GNB	24,029	60	23,778	267	0.5048	0.5026	0.9975	0.6684
	LRC	20,116	3,973	4,185	19,860	0.8305	0.8278	0.8351	0.8314
	QDA	16,852	7,237	3,073	20,972	0.7858	0.8458	0.6996	0.7658

Table 30 ML Models performance for Singly Linked List (Upto Size - OHE Encoding) and in respect to 5 ratios

Ratio	Model	TP	FN	FP	TN	Accuracy	Precision	Recall	F1 Score
	DT	2,778	3,864	2,006	4,574	0.5560	0.5807	0.4182	0.4863
	RBT	4,107	2,535	2,551	4,029	0.6153	0.6169	0.6183	0.6176
	GBDT	6,642	0	3,268	3,312	0.7528	0.6702	1.0000	0.8026
	ABT	6,642	0	3,177	3,403	0.7597	0.6764	1.0000	0.8070
	SVM	6,642	0	3,324	3,256	0.7486	0.6665	1.0000	0.7999
75:25	MLP	6,640	2	3,176	3,404	0.7596	0.6764	0.9997	0.8069
	KNN	4,801	1,841	4,812	1,768	0.4968	0.4994	0.7228	0.5907
	GNB	6,642	0	3,228	3,352	0.7559	0.6729	1.0000	0.8045
	LRC	6,642	0	3,228	3,352	0.7559	0.6729	1.0000	0.8045
	QDA	6,642	0	3,228	3,352	0.7559	0.6729	1.0000	0.8045
	DT	6,431	6,804	4,030	9,178	0.5903	0.6148	0.4859	0.5428
	RBT	8,738	4,497	4,974	8,234	0.6418	0.6373	0.6602	0.6485
	GBDT	13,235	0	6,561	6,647	0.7519	0.6686	1.0000	0.8014
	ABT	13,235	0	6,352	6,856	0.7598	0.6757	1.0000	0.8065
	SVM	13,235	0	6,647	6,561	0.7486	0.6657	1.0000	0.7993
50:50	MLP	13,235	0	6,348	6,860	0.7599	0.6758	1.0000	0.8066
	KNN	9,782	3,453	9,531	3,677	0.5090	0.5065	0.7391	0.6011
	GNB	13,235	0	6,435	6,773	0.7566	0.6729	1.0000	0.8044
	LRC	13,227	8	6,431	6,777	0.7565	0.6729	0.9994	0.8042
	QDA	13,235	0	6,435	6,773	0.7566	0.6729	1.0000	0.8044
	DT	11,305	8,589	6,251	13,520	0.6259	0.6439	0.5683	0.6037
	RBT	13,778	6,116	7,167	12,604	0.6651	0.6578	0.6926	0.6747
	GBDT	19,894	0	9,788	9,983	0.7532	0.6702	1.0000	0.8026
	ABT	19,852	42	9,505	10,266	0.7593	0.6762	0.9979	0.8062
	SVM	19,738	156	10,531	9,240	0.7306	0.6521	0.9922	0.7870
25:75	MLP	19,799	95	9,559	10,212	0.7566	0.6744	0.9952	0.8040
	KNN	14,304	5,590	13,610	6,161	0.5159	0.5124	0.7190	0.5984
	GNB	19,881	13	9,624	10,147	0.7570	0.6738	0.9993	0.8049
	LRC	19,832	62	9,597	10,174	0.7565	0.6739	0.9969	0.8042
	QDA	19,894	0	9,627	10,144	0.7573	0.6739	1.0000	0.8052
	DT	14,597	9,236	7,415	16,350	0.6502	0.6631	0.6125	0.6368
	RBT	16,684	7,149	8,335	15,430	0.6747	0.6669	0.7000	0.6830
	GBDT	23,833	0	11,783	11,982	0.7524	0.6692	1.0000	0.8018
	ABT	23,607	226	11,367	12,398	0.7564	0.6750	0.9905	0.8029
	SVM	23,419	414	13,272	10,493	0.7125	0.6383	0.9826	0.7739
10:90	MLP	23,581	252	11,308	12,457	0.7571	0.6759	0.9894	0.8031
	KNN	16,710	7,123	15,948	7,817	0.5153	0.5117	0.7011	0.5916
	GNB	23,809	24	11,534	12,231	0.7572	0.6737	0.9990	0.8047
	LRC	23,622	211	11,435	12,330	0.7553	0.6738	0.9911	0.8022
	QDA	23,809	24	11,534	12,231	0.7572	0.6737	0.9990	0.8047
	DT	15,702	10,495	8,595	17,566	0.6354	0.6463	0.5994	0.6219
	RBT	15,287	10,910	8,493	17,668	0.6294	0.6429	0.5835	0.6118
	GBDT	25,739	458	13,362	12,799	0.7360	0.6583	0.9825	0.7884
	ABT	24,192	2,005	12,599	13,562	0.7211	0.6576	0.9235	0.7681
	SVM	0	26,197	0	26,161	0.4997	0.0000	0.0000	NaN
1:99	MLP	24,759	1,438	12,751	13,410	0.7290	0.6601	0.9451	0.7773
	KNN	14,841	11,356	14,201	11,960	0.5119	0.5110	0.5665	0.5373
	GNB	26,173	24	13,537	12,624	0.7410	0.6591	0.9991	0.7942
	LRC	24,560	1,637	12,893	13,268	0.7225	0.6558	0.9375	0.7717
	QDA	26,182	15	13,548	12,613	0.7410	0.6590	0.9994	0.7943