Appendices

APPENDIX A

The Results Of Experiments

A.1 The Results Experiment Scenario 1

This experiment uses five combinations of proportioned data: 90% - 10%, 80% - 20%, 70% -30%, 60% -40%, 50% -50% where the data is divided randomly and performed in five experiments.

Table A.1: The results of experiment 1

Exp	Proporsi Dataset	Proportion Data Train		Proportion Data Test		AUC
		Churn	Not Churn	Churn	Not Churn	
1.1	Train90% , Test10%	4.16%	95.84%	0.05%	99.95%	76.00%
1.2	Train90% , Test10%	0.29%	99.71%	34.90%	65.10%	74.50%
1.3	Train90% , Test10%	4.17%	95.83%	0.00%	100.00%	76.10%
1.4	Train90% , Test10%	4.17%	95.83%	0.00%	100.00%	72.90%
1.5	Train90% , Test10%	3.86%	96.14%	2.75%	97.25%	78.20%
2.1	Train80% , Test20%	0.13%	99.87%	18.20%	81.80%	69.00%
2.2	Train80% , Test20%	4.66%	95.34%	0.09%	99.91%	62.10%
2.3	Train80% , Test20%	4.68%	95.32%	0.02%	99.98%	65.20%
2.4	Train80% , Test20%	4.61%	95.39%	0.30%	99.70%	60.90%
2.5	Train80% , Test20%	4.43%	95.57%	1.02%	98.98%	64.20%
3.1	Train70% , Test30%	0.01%	99.99%	12.49%	87.51%	80.64%
3.2	Train70% , Test30%	0.01%	100.00%	12.50%	87.50%	81.64%
3.3	Train70% , Test30%	0.05%	99.95%	12.38%	87.62%	81.84%
3.4	Train70% , Test30%	0.42%	99.58%	11.51%	88.49%	80.14%
3.5	Train70% , Test30%	0.15%	99.85%	12.16%	87.84%	82.10%
4.1	Train60% , Test40%	1.76%	98.24%	6.74%	93.26%	80.70%
4.2	Train60% , Test40%	1.03%	98.97%	7.83%	92.17%	79.70%
4.3	Train60% , Test40%	2.67%	97.33%	5.37%	94.63%	79.20%
4.4	Train60% , Test40%	0.78%	99.22%	8.21%	91.79%	79.00%
4.5	Train60% , Test40%	4.67%	95.33%	2.37%	97.63%	80.30%
5.1	Train50% , Test50%	3.81%	96.19%	3.70%	96.30%	85.64%
5.2	Train50% , Test50%	3.69%	96.31%	3.71%	96.29%	86.10%
5.3	Train50% , Test50%	3.75%	96.25%	3.75%	96.25%	88.64%
5.4	Train50% , Test50%	3.53%	96.47%	3.69%	96.31%	87.40%
5.5	Train50% , Test50%	3.76%	96.24%	3.80%	96.20%	84.30%

A.2 The Results Experiment Scenario 3

In order to know the optimal number of trees, then tested the number of trees (10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90 , 100, 200, 400, 500, 600, 700, 800, 900). in addition to AUC, also calculated another evaluation measure

Table A.2: The results of experiment 3

N tree	Run Time (s)	TP	TN	FP	FN	TPR	TNR	FPR	Recall	AUC
10	322	661	18210	1078	90	88.02%	94.41%	5.59%	88.02%	91.16%
15	347	671	18132	1156	80	89.35%	94.01%	5.99%	89.35%	91.65%
20	332	647	18305	983	104	86.15%	94.90%	5.10%	86.15%	90.42%
25	313	665	18144	1144	86	88.55%	94.07%	5.93%	88.55%	91.27%
30	290	648	18187	1101	103	86.28%	94.29%	5.71%	86.28%	90.20%
35	196	655	18077	1211	96	87.22%	93.72%	6.28%	87.22%	90.41%
40	179	652	18158	1130	99	86.82%	94.14%	5.86%	86.82%	90.41%
45	181	643	18067	1221	108	85.62%	93.67%	6.33%	85.62%	89.55%
50	175	644	18084	1204	107	85.75%	93.76%	6.24%	85.75%	89.67%
60	202	643	18033	1255	108	85.62%	93.49%	6.51%	85.62%	89.47%
70	177	640	18140	1148	111	85.22%	94.05%	5.95%	85.22%	89.53%
80	169	633	18017	1271	118	84.29%	93.41%	6.59%	84.29%	88.73%
90	167	633	17941	1347	118	84.29%	93.02%	6.98%	84.29%	88.54%
100	163	625	17903	1385	126	83.22%	92.82%	7.18%	83.22%	87.89%
200	169	625	17756	1532	126	83.22%	92.06%	7.94%	83.22%	87.53%
400	188	626	17549	1739	125	83.36%	90.98%	9.02%	83.36%	87.09%
500	199	626	17579	1709	125	83.36%	91.14%	8.86%	83.36%	87.16%
600	212	630	17395	1893	121	83.89%	90.19%	9.81%	83.89%	86.98%
700	222	627	17381	1907	124	83.49%	90.11%	9.89%	83.49%	86.74%
800	239	626	17482	1806	125	83.36%	90.64%	9.36%	83.36%	86.92%
900	255	624	17535	1753	127	83.09%	90.91%	9.09%	83.09%	86.91%

A.3 Performance Measurement

Base on experiment design in thesis, performance measurement is calculated for the three methods : Random Forest, Balance Random Forest, and Modified Balanced Random Forest

Table A.3: The Results of comparison performance measurement

Algoritma	N-Tree	Sensitifity	Specificity	G-Means	AUC
RF	10	14.44%	83.77%	34.78%	49.10%
	15	16.21%	89.14%	38.01%	52.67%
	25	11.67%	88.72%	32.18%	50.19%
BRF	10	71.40%	91.87%	80.99%	81.63%
	15	74.44%	93.42%	83.39%	83.93%
	25	75.46%	93.64%	84.06%	84.55%
MBRF	10	88.02%	94.41%	91.16%	91.16%
	15	89.35%	94.01%	91.65%	91.65%
	25	88.55%	94.07%	91.27%	91.27%