

Table 1. Descriptive statistics of sample results of classification algorithms using data pre-processing techniques in binary class models from the perspective of evaluation metrics.

DESCRIPTIVE STATISTICS										
Metric	Technique	Count	Mean	S_Dev	Var	Min	Q1	Median	Q3	Max
Precision	RF	12	67,53%	34,51%	11,91%	13,65%	39,48%	70,28%	99,89%	99,92%
	XGBoost	12	88,47%	12,90%	1,66%	62,65%	80,39%	90,22%	99,93%	99,95%
	LightGBM	12	86,54%	17,64%	3,11%	40,66%	80,47%	90,20%	99,88%	99,92%
	kNN	12	74,86%	27,53%	7,58%	37,45%	43,59%	84,70%	99,83%	99,88%
Recall	RF	12	97,55%	3,27%	0,11%	88,97%	96,40%	98,26%	99,99%	99,99%
	XGBoost	12	99,99%	0,01%	0,00%	99,98%	99,98%	99,99%	99,99%	99,99%
	LightGBM	12	99,97%	0,03%	0,00%	99,93%	99,95%	99,98%	99,99%	99,99%
	kNN	12	97,52%	4,78%	0,23%	87,26%	99,28%	99,51%	99,72%	99,79%
F1-Score	RF	12	74,30%	25,77%	6,64%	24,01%	56,61%	76,06%	98,02%	98,19%
	XGBoost	12	93,40%	7,59%	0,58%	77,04%	89,13%	94,58%	99,96%	99,97%
	LightGBM	12	91,73%	12,07%	1,46%	57,81%	89,18%	94,56%	99,91%	99,94%
	kNN	12	82,30%	19,91%	3,97%	52,42%	60,57%	90,75%	99,79%	99,84%
FAR	RF	12	16,89%	26,00%	6,76%	0,02%	0,03%	10,52%	22,20%	91,63%
	XGBoost	12	2,25%	2,71%	0,07%	0,01%	0,02%	1,76%	3,53%	8,63%
	LightGBM	12	3,31%	5,91%	0,35%	0,02%	0,03%	1,77%	3,51%	21,14%
	kNN	12	7,61%	9,00%	0,81%	0,03%	0,04%	3,15%	17,65%	21,12%

Table 2. Descriptive statistics of sample results of classification algorithms using data preprocessing techniques in multiclass models of **specific attacks in Group 1** from the perspective of evaluation metrics.

DESCRIPTIVE STATISTICS										
Metric	Technique	Count	Mean	S_Dev	Var	Min	Q1	Median	Q3	Max
Precision	RF	12	87,59%	15,05%	2,27%	63,86%	79,97%	93,30%	99,99%	99,99%
	XGBoost	12	90,69%	12,91%	1,67%	64,27%	78,14%	98,99%	99,99%	99,99%
	LightGBM	12	61,76%	32,89%	10,82%	0,00%	51,18%	66,63%	85,35%	98,57%
	kNN	12	78,67%	24,01%	5,77%	45,58%	53,45%	87,64%	99,99%	99,99%
Recall	RF	12	82,65%	17,36%	3,02%	64,48%	66,58%	83,12%	99,23%	99,34%
	XGBoost	12	79,30%	23,17%	5,37%	35,45%	64,24%	83,69%	99,99%	99,99%
	LightGBM	12	50,78%	35,08%	12,31%	0,00%	25,18%	57,07%	71,40%	98,46%
	kNN	12	76,99%	26,40%	6,97%	33,29%	61,37%	84,22%	99,97%	99,98%
F1-Score	RF	12	84,84%	15,90%	2,53%	64,17%	72,53%	87,57%	99,61%	99,67%
	XGBoost	12	83,88%	18,65%	3,48%	45,70%	72,35%	88,97%	99,99%	99,99%
	LightGBM	12	53,81%	33,25%	11,05%	0,00%	33,96%	59,16%	75,40%	98,52%
	kNN	12	77,58%	25,35%	6,42%	38,48%	57,12%	85,85%	99,98%	99,99%
FAR	RF	12	0,06%	0,08%	0,00%	0,00%	0,00%	0,03%	0,10%	0,20%
	XGBoost	12	0,04%	0,05%	0,00%	0,00%	0,00%	0,00%	0,10%	0,11%
	LightGBM	12	0,35%	0,34%	0,00%	0,06%	0,13%	0,24%	0,42%	1,23%
	kNN	12	0,11%	0,13%	0,00%	0,00%	0,00%	0,07%	0,22%	0,34%

Table 3. Descriptive statistics of sample results of classification algorithms using data pre-processing techniques in multiclass models of **specific attacks in Group 2** from the perspective of evaluation metrics.

DESCRIPTIVE STATISTICS										
Metric	Technique	Count	Mean	S_Dev	Var	Min	Q1	Median	Q3	Max
Precision	RF	18	77,89%	31,92%	10,19%	32,36%	35,07%	99,74%	99,89%	99,94%
	XGBoost	18	68,05%	46,42%	21,54%	3,41%	4,78%	99,89%	99,99%	99,99%
	LightGBM	18	49,52%	40,76%	16,61%	3,99%	6,27%	50,39%	89,66%	99,99%
	kNN	18	74,57%	36,22%	13,12%	21,08%	27,70%	98,98%	99,79%	99,95%
Recall	RF	18	82,50%	26,18%	6,86%	0,29%	76,95%	93,75%	99,78%	99,82%
	XGBoost	18	67,32%	47,54%	22,60%	1,50%	2,33%	99,98%	99,99%	99,99%
	LightGBM	18	41,35%	40,78%	16,63%	0,00%	3,75%	26,00%	83,48%	98,66%
	kNN	18	83,35%	24,08%	5,80%	42,40%	62,61%	99,18%	99,72%	99,91%
F1-Score	RF	18	77,55%	31,51%	9,93%	0,58%	46,46%	96,63%	99,84%	99,86%
	XGBoost	18	67,54%	47,18%	22,26%	2,09%	3,13%	99,93%	99,99%	99,99%
	LightGBM	18	41,40%	40,94%	16,76%	0,00%	4,98%	17,98%	84,63%	98,22%
	kNN	18	77,32%	32,28%	10,42%	30,89%	34,84%	99,05%	99,75%	99,93%
FAR	RF	18	0,25%	0,40%	0,00%	0,00%	0,01%	0,02%	0,43%	1,03%
	XGBoost	18	0,10%	0,14%	0,00%	0,00%	0,00%	0,01%	0,27%	0,31%
	LightGBM	18	1,03%	1,28%	0,02%	0,00%	0,33%	0,63%	1,03%	5,31%
	kNN	18	0,37%	0,51%	0,00%	0,00%	0,02%	0,05%	0,74%	1,54%