Supplementary material (RQ4)

The contrast of clustering effectiveness (FMI) among 100%, 80%, 60%, 40%, and 20% of successful test cases scenarios

The contrast of clustering effectiveness (JC) among 100%, 80%, 60%, 40%, and 20% of successful test cases scenarios

The contrast of clustering effectiveness (PR) among 100%, 80%, 60%, 40%, and 20% of successful test cases scenarios

The contrast of clustering effectiveness (RR) among 100%, 80%, 60%, 40%, and 20% of successful test cases scenarios

Table 1: Group1

the values of M \ X / M		100%	80%	60%	40%	20%
FMI	mean	0.83	0.83	0.83	0.83	0.85
	median	0.79	0.79	0.79	0.79	0.81
JC	mean	0.74	0.74	0.74	0.73	0.76
	median	0.67	0.67	0.67	0.67	0.71
PR	mean	0.83	0.84	0.84	0.83	0.83
	median	0.85	0.86	0.86	0.84	0.83
RR	mean	0.63	0.64	0.63	0.63	0.67
	median	0.51	0.51	0.52	0.53	0.62
	V^X_{equal}	**209**	**213**	**207**	**219**	**192**

Table 2: Group2

the values of M \ X / M		100%	80%	60%	40%	20%
FMI	mean	0.83	0.84	0.84	0.84	0.86
	median	0.79	0.80	0.80	0.80	0.84
JC	mean	0.74	0.75	0.75	0.75	0.77
	median	0.68	0.68	0.69	0.69	0.73
PR	mean	0.85	0.85	0.85	0.84	0.84
	median	0.87	0.87	0.87	0.86	0.85
RR	mean	0.64	0.65	0.66	0.65	0.69
	median	0.53	0.54	0.55	0.55	0.64
	V^X_{equal}	**225**	**223**	**217**	**222**	**207**

Table 3: Group3

the values of M \ X / M		100%	80%	60%	40%	20%
FMI	mean	0.86	0.86	0.86	0.85	0.83
	median	0.88	0.87	0.86	0.85	0.80
JC	mean	0.78	0.78	0.78	0.77	0.74
	median	0.80	0.79	0.76	0.75	0.67
PR	mean	0.82	0.83	0.84	0.84	0.82
	median	0.85	0.87	0.89	0.85	0.80
RR	mean	0.73	0.71	0.71	0.70	0.67
	median	0.68	0.66	0.67	0.66	0.62
	V^X_{equal}	**149**	**154**	**141**	**160**	**174**

Table 4: Group4

the values of M \ X / M		100%	80%	60%	40%	20%
FMI	mean	0.88	0.87	0.88	0.87	0.88
	median	0.89	0.89	0.89	0.88	0.89
JC	mean	0.81	0.79	0.80	0.80	0.80
	median	0.81	0.81	0.81	0.81	0.81
PR	mean	0.88	0.87	0.87	0.88	0.86
	median	1.00	0.97	0.97	1.00	0.97
RR	mean	0.77	0.74	0.75	0.75	0.74
	median	0.76	0.68	0.71	0.72	0.67
	V^X_{equal}	**102**	**112**	**113**	**131**	**149**

Table 5: Group5

the values of M \ X / M		100%	80%	60%	40%	20%
FMI	mean	0.83	0.83	0.83	0.83	0.83
	median	0.79	0.79	0.79	0.79	0.79
JC	mean	0.74	0.74	0.74	0.74	0.74
	median	0.68	0.68	0.68	0.68	0.68
PR	mean	0.79	0.79	0.79	0.79	0.79
	median	0.76	0.76	0.76	0.76	0.76
RR	mean	0.64	0.64	0.64	0.64	0.64
	median	0.54	0.54	0.54	0.54	0.54
	V^X_{equal}	**247**	**247**	**247**	**247**	**247**

Table 6: Group6

the values of M \ X / M		100%	80%	60%	40%	20%
FMI	mean	0.82	0.82	0.82	0.82	0.83
	median	0.78	0.77	0.77	0.77	0.78
JC	mean	0.73	0.72	0.72	0.72	0.73
	median	0.66	0.64	0.64	0.65	0.65
PR	mean	0.82	0.81	0.82	0.81	0.81
	median	0.81	0.81	0.80	0.80	0.80
RR	mean	0.64	0.64	0.64	0.65	0.65
	median	0.55	0.55	0.55	0.59	0.55
	V^X_{equal}	**235**	**236**	**222**	**210**	**194**

Table 7: Group7

the values of M \ X / M		100%	80%	60%	40%	20%
FMI	mean	0.83	0.83	0.83	0.84	0.85
	median	0.79	0.79	0.79	0.81	0.82
JC	mean	0.74	0.74	0.74	0.75	0.77
	median	0.66	0.66	0.66	0.70	0.73
PR	mean	0.83	0.83	0.83	0.82	0.82
	median	0.85	0.85	0.84	0.82	0.82
RR	mean	0.63	0.63	0.64	0.66	0.68
	median	0.51	0.51	0.51	0.56	0.64
	V^X_{equal}	**198**	**198**	**188**	**191**	**170**

Table 8: Group8

the values of M \ X / M		100%	80%	60%	40%	20%
FMI	mean	0.83	0.83	0.83	0.84	0.84
	median	0.79	0.80	0.79	0.81	0.84
JC	mean	0.73	0.74	0.73	0.74	0.75
	median	0.67	0.68	0.67	0.71	0.73
PR	mean	0.80	0.80	0.80	0.82	0.82
	median	0.82	0.81	0.80	0.85	0.86
RR	mean	0.63	0.64	0.63	0.65	0.67
	median	0.52	0.54	0.54	0.56	0.65
	V^X_{equal}	**170**	**168**	**173**	**169**	**195**

Table 9: Group9

the values of M \ X / M		100%	80%	60%	40%	20%
FMI	mean	0.82	0.82	0.82	0.82	0.82
	median	0.77	0.77	0.77	0.77	0.77
JC	mean	0.72	0.71	0.72	0.72	0.73
	median	0.65	0.64	0.64	0.64	0.64
PR	mean	0.82	0.81	0.82	0.81	0.80
	median	0.81	0.80	0.80	0.80	0.78
RR	mean	0.64	0.63	0.64	0.64	0.64
	median	0.54	0.54	0.55	0.56	0.55
	$\boldsymbol{V^X_{equal}}$	**239**	**243**	**226**	**220**	**201**

Table 10: Group10

the values of M \ X / M		100%	80%	60%	40%	20%
FMI	mean	0.83	0.82	0.81	0.83	0.82
	median	0.76	0.76	0.75	0.78	0.78
JC	mean	0.74	0.72	0.72	0.74	0.73
	median	0.63	0.62	0.60	0.65	0.65
PR	mean	0.81	0.82	0.81	0.81	0.81
	median	0.82	0.81	0.81	0.81	0.80
RR	mean	0.65	0.63	0.62	0.65	0.66
	median	0.54	0.54	0.54	0.58	0.57
	$\boldsymbol{V^X_{equal}}$	**181**	**199**	**194**	**174**	**208**

Table 11: Group11

the values of M \ X / M		100%	80%	60%	40%	20%
FMI	mean	0.82	0.82	0.82	0.81	0.81
	median	0.79	0.79	0.79	0.79	0.79
JC	mean	0.72	0.71	0.71	0.71	0.70
	median	0.67	0.66	0.67	0.66	0.66
PR	mean	0.82	0.81	0.81	0.81	0.80
	median	0.85	0.82	0.80	0.81	0.79
RR	mean	0.68	0.67	0.66	0.67	0.65
	median	0.64	0.61	0.59	0.60	0.57
	$\boldsymbol{V^X_{equal}}$	**251**	**255**	**261**	**261**	**263**

Table 12: Group12

the values of M \ X / M		100%	80%	60%	40%	20%
FMI	mean	0.84	0.84	0.84	0.84	0.85
	median	0.80	0.81	0.81	0.82	0.82
JC	mean	0.74	0.74	0.74	0.76	0.76
	median	0.68	0.69	0.69	0.71	0.72
PR	mean	0.86	0.86	0.85	0.85	0.85
	median	0.90	0.89	0.90	0.89	0.89
RR	mean	0.67	0.67	0.67	0.68	0.69
	median	0.61	0.61	0.61	0.64	0.65
	$\boldsymbol{V^X_{equal}}$	**265**	**256**	**266**	**254**	**242**