

data/USD.csv

May 9, 2011

1 Tables of Friedman, Aligned Friedman, Bonferroni-Dunn, Holm, Hochberg and Hommel Tests

1

Table 1: Average Rankings of the algorithms (Friedman)

Algorithm	Ranking
C45Rules $_G M_t st$	7.571428571428574
OCEC $_G M_t st$	3.8571428571428568
Ripper $_G M_t st$	5.547619047619048
GAssist $_G M_t st$	5.571428571428571
REGAL $_G M_t st$	6.166666666666666
UCS $_G M_t st$	1.6904761904761896
REGALTC $_G M_t st$	6.190476190476191
SIA $_G M_t st$	5.476190476190476
Oblique-DT $_G M_t st$	2.928571428571428

Friedman statistic (distributed according to chi-square with 8 degrees of freedom: 150.0444444444447. P-value computed by Friedman

Test: 9.030087788630681E-11.

Iman and Davenport statistic (distributed according to F-distribution with 8 and 328 degrees of freedom: 33.082217973231465. P-value computed by Iman and Davenport Test: 5.070852739474346E-38.

Table 2: Average Rankings of the algorithms (Aligned Friedman)

Algorithm	Ranking
C45Rules $_G M_t st$	290.2857142857142
OCEC $_G M_t st$	154.2142857142857
Ripper $_G M_t st$	204.78571428571428
GAssist $_G M_t st$	218.92857142857144
REGAL $_G M_t st$	232.16666666666666
UCS $_G M_t st$	59.92857142857142
REGALTC $_G M_t st$	236.2380952380953
SIA $_G M_t st$	213.92857142857144
Oblique-DT $_G M_t st$	95.0238095238095

Aligned Friedman statistic (distributed according to chi-square with 8 degrees of freedom: 38.19148494202739. P-value computed by

Aligned Friedman Test: 6.9391935526574855E-6.

Table 3: Average Rankings of the algorithms (Quade)

Algorithm	Ranking
C45Rules $_G M_t st$	7.39091915836102
OCEC $_G M_t st$	4.401993355481727
Ripper $_G M_t st$	5.6511627906976765
GAssist $_G M_t st$	5.749723145071983
REGAL $_G M_t st$	5.584717607973423
UCS $_G M_t st$	1.6511627906976742
REGALTC $_G M_t st$	6.0254706533776305
SIA $_G M_t st$	5.8394241417497215
Oblique-DT $_G M_t st$	2.705426356589147

Quade statistic (distributed according to F-distribution with 8 and 328 degrees of freedom: 19.673017684132688. P-value computed by Quade Test: 3.285589861337156E-24.

Table 4: Contrast Estimation

	C45Rules $G_{Mf, st}$	OCBEG Mf, st	Ripper $G_{Mf, st}$	GAssist $G_{Mf, st}$	REGAL $G_{Mf, st}$	UCS $G_{Mf, st}$	REGALTCG Mf, st	SIA $G_{Mf, st}$	Oblique-DTG Mf, st
C45Rules $G_{Mf, st}$	0.00000000	-0.09537389	-0.06649611	-0.05737611	-0.03744944	-0.14316167	-0.04550278	-0.06694222	-0.11780778
OCBEG Mf, st	0.09537389	0.00000000	0.02887778	0.03799778	0.05792444	-0.04778778	0.04987111	0.02843167	-0.02243389
Ripper $G_{Mf, st}$	0.06649611	-0.02887778	0.00000000	0.00912000	0.02904667	-0.07666556	0.02099333	-0.00044611	-0.05131167
GAssist $G_{Mf, st}$	0.05737611	-0.03799778	-0.00912000	0.00000000	0.01992667	-0.08578556	0.01187333	-0.00956611	-0.06043167
REGAL $G_{Mf, st}$	0.03744944	-0.05792444	-0.02904667	-0.01992667	0.00000000	-0.10571222	-0.00805333	-0.02949278	-0.08035833
UCS $G_{Mf, st}$	0.14316167	0.04778778	0.07666556	0.08578556	0.10571222	0.00000000	0.09765889	0.07621944	0.02535389
REGALTCG Mf, st	0.04550278	-0.04987111	-0.02099333	-0.01187333	0.00805333	-0.09765889	0.00000000	-0.02143944	-0.07230600
SIA $G_{Mf, st}$	0.06694222	-0.02843167	0.00044611	0.00956611	0.02949278	-0.07621944	0.02143944	0.00000000	-0.05086656
Oblique-DTG Mf, st	0.11780778	0.02243389	0.05131167	0.06043167	0.08035833	-0.02535389	0.07230600	0.05086656	0.00000000

Table 5: Holm / Hochberg / Holland / Rom / Finner / Li Table for $\alpha = 0.05$ (FRIEDMAN)

i	algorithm	$z = (R_0 - R_i)/SE$	p	Holm/Hochberg/Hommel	Holland	Rom	Finner	Li
8	C45Rules $_G M_t st$	9.840715550186513	7.517425014068682E-23	0.00625	0.006391150954545011	0.006574125233361166	0.006391150954545011	0.050616280723
7	REGALTC $_G M_t st$	7.529940238806682	5.076355049586499E-14	0.0071428571428571435	0.007300831979014655	0.0075128293213784685	0.012741455098566168	0.050616280723
6	REGAL $_G M_t st$	7.4900992851622	6.882153217565152E-14	0.008333333333333333	0.008512444610847103	0.008764162596519848	0.019051173490195694	0.050616280723
5	GAssist $_G M_t st$	6.494075444050207	8.3544876219434E-11	0.01	0.010206218313011495	0.010515350115740741	0.025320565519103666	0.050616280723
4	Ripper $_G M_t st$	6.454234490405728	1.0876728665160106E-10	0.0125	0.012741455098566168	0.013109375000000001	0.031549888917161595	0.050616280723
3	SIA $_G M_t st$	6.334711629472288	2.377855836474496E-10	0.016666666666666666	0.016952427508441503	0.016666666666666666	0.03773939976903784	0.050616280723
2	OCEC $_G M_t st$	3.6255267816476615	2.883730071109108E-4	0.025	0.025320565519103666	0.025	0.04388935252272508	0.050616280723
1	Oblique-DT $_G M_t st$	2.0717295895129495	0.03829066625474008	0.05	0.0500000000000000044	0.05	0.0500000000000000044	0.05

Bonferroni-Dunn's procedure rejects those hypotheses that have a p-value ≤ 0.00625 .

Hochberg's procedure rejects those hypotheses that have a p-value ≤ 0.05 .

Hommel's procedure rejects all hypotheses.

Rom's procedure rejects those hypotheses that have a p-value ≤ 0.05 .

Li's procedure rejects those hypotheses that have a p-value ≤ 0.05 .

Table 6: Holm / Hochberg / Holland / Rom / Finner / Li Table for $\alpha = 0.05$ (ALIGNED FRIEDMAN)

i	algorithm	$z = (R_0 - R_i) / SE$	p	Holm/Hochberg/Hommel	Holland	Rom	Finner	Li
8	C45Rules $_G M_t st$	9.661319595841567	4.4015718737506645E-22	0.00625	0.006391150954545011	0.006574125233361166	0.006391150954545011	0.045208230303
7	REGALTC $_G M_t st$	7.394529365085979	1.4190999189442166E-13	0.0071428571428571435	0.0073008331979014655	0.0075128293213784685	0.012741455098566168	0.045208230303
6	REGAL $_G M_t st$	7.223771158275751	5.056532197469598E-13	0.008333333333333333	0.008512444610847103	0.008764162596519848	0.019051173490195694	0.045208230303
5	GAssist $_G M_t st$	6.668557339641345	2.5833012309511498E-11	0.01	0.010206218313011495	0.010515350115740741	0.025320565519103666	0.045208230303
4	SIA $_G M_t st$	6.458854278646334	1.054986373546613E-10	0.0125	0.012741455098566168	0.013109375000000001	0.031549888917161595	0.045208230303
3	Ripper $_G M_t st$	6.0753972528268845	1.2368115213595666E-9	0.016666666666666666	0.016952427508441503	0.016666666666666666	0.03773939976903784	0.045208230303
2	OCEC $_G M_t st$	3.9544005787630603	7.672676818858269E-5	0.025	0.025320565519103666	0.025	0.04388935252272508	0.045208230303
1	Oblique-DT $_G M_t st$	1.4719157709840276	0.1410436242310042	0.05	0.0500000000000000044	0.05	0.0500000000000000044	0.05

Bonferroni-Dunn's procedure rejects those hypotheses that have a p-value ≤ 0.00625 .

Holm's procedure rejects those hypotheses that have a p-value ≤ 0.05 .

Hochberg's procedure rejects those hypotheses that have a p-value ≤ 0.025 .

Hommel's procedure rejects those hypotheses that have a p-value ≤ 0.05 .

Holland's procedure rejects those hypotheses that have a p-value $\leq 0.0500000000000000044$.

Rom's procedure rejects those hypotheses that have a p-value ≤ 0.025 .

Finner's procedure rejects those hypotheses that have a p-value $\leq 0.0500000000000000044$.

Li's procedure rejects those hypotheses that have a p-value ≤ 0.04520823030363136 .

Table 7: Holm / Hochberg / Holland / Rom / Finner / Li Table for $\alpha = 0.05$ (QUADE)

i	algorithm	$z = (R_0 - R_i) / SE$	p	Holm/Hochberg/Hommel	Holland	Rom	Finner	Li
8	C45Rules $_G M_t st$	4.183240880803186	2.8738260804828175E-5	0.00625	0.006391150954545011	0.006574125233361166	0.006391150954545011	0.0293542486034
7	REGALTC $_G M_t st$	3.188076689016512	0.00143222254574603145	0.0071428571428571435	0.007300831979014655	0.0075128293213784685	0.0127414550985666168	0.0293542486034
6	SIAG $M_t st$	3.052482541230492	0.002269569330784574	0.008333333333333333	0.008512444610847103	0.008764162596519848	0.019051173490193694	0.0293542486034
5	GAssist $_G M_t st$	2.987106791405092	0.0028163132525869682	0.01	0.010206218313011495	0.010515350115740741	0.025320565519103666	0.0293542486034
4	Ripper $_G M_t st$	2.915274177399404	0.0035537618706657716	0.0125	0.012741455098566168	0.013109375000000001	0.031549888917161595	0.0293542486034
3	REGAL $_G M_t st$	2.8668476960472544	0.0041458247600415455	0.016666666666666666	0.016952427508441503	0.016666666666666666	0.03773939976903784	0.0293542486034
2	OCEC $_G M_t st$	2.004856327978991	0.04497840867256614	0.025	0.025320565519103666	0.025	0.04388935252272508	0.0293542486034
1	Oblique-DT $_G M_t st$	0.7683668374541063	0.4422692765342257	0.05	0.0500000000000000044	0.05	0.0500000000000000044	0.05

Bonferroni-Dunn's procedure rejects those hypotheses that have a p-value ≤ 0.00625 .
 Holm's procedure rejects those hypotheses that have a p-value ≤ 0.025 .
 Hochberg's procedure rejects those hypotheses that have a p-value $\leq 0.016666666666666666$.
 Hommel's procedure rejects those hypotheses that have a p-value ≤ 0.025 .
 Holland's procedure rejects those hypotheses that have a p-value $\leq 0.025320565519103666$.
 Rom's procedure rejects those hypotheses that have a p-value $\leq 0.016666666666666666$.
 Finner's procedure rejects those hypotheses that have a p-value ≤ 0.04388935252272508 .
 Li's procedure rejects those hypotheses that have a p-value $\leq 0.029354248603461804$.

Table 8: Adjusted p -values (FRIEDMAN)

i	algorithm	unadjusted p	p_{Bonf}	p_{Holm}	p_{Hoch}	p_{Hommel}
1	C45Rules $_G M_t st$	7.517425014068682E-23	6.013940011254946E-22	6.013940011254946E-22	6.013940011254946E-22	6.013940011254946E-22
2	REGALTC $_G M_t st$	5.076355049586499E-14	4.0610840396691993E-13	3.5534485347105493E-13	3.5534485347105493E-13	3.0458130297518993E-13
3	REGAL $_G M_t st$	6.882153217365152E-14	5.505722574052122E-13	4.129291930539091E-13	4.129291930539091E-13	4.129291930539091E-13
4	GAssist $_G M_t st$	8.3544876219434E-11	6.68359009755472E-10	4.1772438109717E-10	4.1772438109717E-10	3.3417950487736E-10
5	Ripper $_G M_t st$	1.0876728665160106E-10	8.701382932128085E-10	4.3506914660640423E-10	4.3506914660640423E-10	4.3506914660640423E-10
6	SIA $_G M_t st$	2.377855836474496E-10	1.902284669179597E-9	7.133567509423489E-10	7.133567509423489E-10	7.133567509423489E-10
7	OCEC $_G M_t st$	2.883730071109108E-4	0.0023069840568872863	5.767460142218216E-4	5.767460142218216E-4	5.767460142218216E-4
8	Oblique-DT $_G M_t st$	0.03829066625474008	0.3063253300379206	0.03829066625474008	0.03829066625474008	0.03829066625474008

Table 9: Adjusted p -values (FRIEDMAN)

i	algorithm	unadjusted p	p_{Hol}	p_{Bon}	p_{Finn}	p_{Li}
1	C45Rules $_G M_t st$	7.517425014068682E-23	0.0	5.717433686782108E-22	0.0	7.816732925730258E-23
2	REGALTC $_G M_t st$	5.076355049586499E-14	3.551603455775876E-13	3.378457590631834E-13	2.0294876890147862E-13	5.278471229781023E-14
3	REGAL $_G M_t st$	6.882153217365152E-14	4.1300296516055823E-13	3.9263039347866385E-13	2.0294876890147862E-13	7.156167644503305E-14
4	GAssist $_G M_t st$	8.3544876219434E-11	4.177241885727767E-10	3.972519949401075E-10	1.6708967542911068E-10	8.687123362609052E-11
5	Rippet $_G M_t st$	1.0876728665160106E-10	4.35069313908798E-10	4.148454318058681E-10	1.740276811545982E-10	1.130978798091922E-10
6	SIA $_G M_t st$	2.377855836474496E-10	7.133567070383151E-10	7.133567509423489E-10	3.170473883429281E-10	2.472530683076865E-10
7	OCEC $_G M_t st$	2.883730071109108E-4	5.766628552306141E-4	5.767460142218216E-4	3.2956236193548705E-4	2.997647552450365E-4
8	Oblique-DT $_G M_t st$	0.03829066625474008	0.03829066625474009	0.03829066625474008	0.03829066625474009	0.038290666254740084

Table 10: Adjusted p -values (ALIGNED FRIEDMAN)

i	algorithm	unadjusted p	p_{Bonf}	p_{Holm}	p_{Hoch}	p_{Hommel}
1	C45Rules $_G M_t st$	4.4015718737506645E-22	3.5212574990005316E-21	3.5212574990005316E-21	3.5212574990005316E-21	3.5212574990005316E-21
2	REGALTC $_G M_t st$	1.4190999189442166E-13	1.1352799351553733E-12	9.933699432609517E-13	9.933699432609517E-13	9.933699432609517E-13
3	REGAL $_G M_t st$	5.056532197469598E-13	4.045225757975679E-12	3.033919318481759E-12	3.033919318481759E-12	3.033919318481759E-12
4	GAssist $_G M_t st$	2.5833012309511498E-11	2.0666409847609198E-10	1.291650615475575E-10	1.291650615475575E-10	1.291650615475575E-10
5	SIA $_G M_t st$	1.054986373546613E-10	8.439890988372904E-10	4.219945494186452E-10	4.219945494186452E-10	4.219945494186452E-10
6	Ripper $_G M_t st$	1.2368115213595666E-9	9.894492170876533E-9	3.7104345640787E-9	3.7104345640787E-9	3.7104345640787E-9
7	OCEC $_G M_t st$	7.672676818858269E-5	6.138141455086615E-4	1.5345353637716538E-4	1.5345353637716538E-4	1.5345353637716538E-4
8	Oblique-DT $_G M_t st$	0.1410436242310042	1.1283489938480336	0.1410436242310042	0.1410436242310042	0.1410436242310042

Table 11: Adjusted p -values (ALIGNED FRIEDMAN)

i	algorithm	unadjusted p	p_{Holl}	p_{Rom}	p_{Finn}	p_{Li}
1	C45Rules $_G M_t st$	4.4015718737506645E-22	0.0	3.3476483315334294E-21	0.0	5.1243252834698155E-22
2	REGALTC $_G M_t st$	1.4190999189442166E-13	9.93205517829665E-13	9.444510571443659E-13	5.6754601018838E-13	1.652121061064956E-13
3	REGAL $_G M_t st$	5.056532197469598E-13	3.034239526300553E-12	2.8847777193667603E-12	1.3485879080121776E-12	5.886832370200027E-13
4	GAssist $_G M_t st$	2.5833012309511498E-11	1.2916501201942765E-10	1.22283477024146486E-10	5.166600480777106E-11	3.0074882773420374E-11
5	SIA $_G M_t st$	1.054986373546613E-10	4.2199443939239245E-10	4.023785930094352E-10	1.687977535524965E-10	1.2282188050266726E-10
6	Ripper $_G M_t st$	1.2368115213595666E-9	3.7104346262140098E-9	3.7104345640787E-9	1.6490820931025496E-9	1.4399002725504006E-9
7	OCEC $_G M_t st$	7.672676818858269E-5	1.534476493801895E-4	1.5345353637716538E-4	8.768725449093129E-5	8.931759202522871E-5
8	Oblique-DT $_G M_t st$	0.1410436242310042	0.1410436242310042	0.1410436242310042	0.14104362423100425	0.1410436242310042

Table 12: Adjusted p -values (QUADE)

i	algorithm	unadjusted p	p_{Bonf}	p_{Holm}	p_{Hoch}	p_{Hommel}
1	C45Rules $_G M_t st$	2.8738260804828175E-5	2.299060864386254E-4	2.299060864386254E-4	2.299060864386254E-4	2.299060864386254E-4
2	REGALTC $_G M_t st$	0.0014322254574603145	0.011457803659682516	0.010025578202222201	0.010025578202222201	0.006909707933402576
3	SIA $_G M_t st$	0.002269569330784574	0.0118156554646276593	0.013617415984707445	0.012437474280124636	0.008291649520083091
4	GAssist $_G M_t st$	0.0028163132525869682	0.022530506020695746	0.01408156626293484	0.012437474280124636	0.008448939757760905
5	Ripper $_G M_t st$	0.0035537618706657716	0.028430094965326173	0.014215047482663086	0.012437474280124636	0.010661285611997315
6	REGAL $_G M_t st$	0.0041458247600415455	0.033166598080332364	0.014215047482663086	0.012437474280124636	0.012437474280124636
7	OCEC $_G M_t st$	0.04497840867256614	0.3598272693805291	0.08995681734513228	0.08995681734513228	0.08995681734513228
8	Oblique-DT $_G M_t st$	0.4422692765342257	3.5381542122738057	0.4422692765342257	0.4422692765342257	0.4422692765342257

Table 13: Adjusted p -values (QUADE)

i	algorithm	unadjusted p	p_{Hol}	p_{Rom}	p_{Finn}	p_{Li}
1	C45Rules $_G M_t st$	2.8738260804828175E-5	2.298829629141519E-4	2.1857098689718077E-4	2.298829629141519E-4	5.152447027230538E-5
2	REGALTC $_G M_t st$	0.0014322254574603145	0.00998260421592534	0.00953186473559822	0.0057166059585908036	0.002561374032772224
3	SIA $_G M_t st$	0.002269569330784574	0.013540385221410212	0.012437474280124636	0.006040744111907803	0.0040528002573903665
4	GAssist $_G M_t st$	0.0028163132525869682	0.014002473124467008	0.012437474280124636	0.006040744111907803	0.005024222889616282
5	Ripper $_G M_t st$	0.0035537618706657716	0.01413945150757634	0.012437474280124636	0.006040744111907803	0.006331480672471479
6	REGAL $_G M_t st$	0.0041458247600415455	0.01413945150757634	0.012437474280124636	0.006040744111907803	0.007378533190488949
7	OCEC $_G M_t st$	0.04497840867256614	0.08793376009841603	0.08995681734513228	0.05123658029596467	0.07462705685740663
8	Oblique-DT $_G M_t st$	0.4422692765342257	0.44226927653422576	0.4422692765342257	0.44226927653422576	0.4422692765342257