

6月19日ゼミ資料

① 寺内手法での順序付け精度比較

問題設定 N=6,生成法 a3,手法数合計 41 種,効用値 u1,u2,順序付け方法 maximin, Maximax, minimax-regret

maximin u1 N=6 調和平均

	A	B	C	D	E
EV	840,697	830,446	832,144	844,435	828,911
GM	845,379	829,860	834,054	845,984	832,567
MSW	872,799	820,280	848,098	856,819	857,503
MSWW	843,919	823,006	837,687	842,432	841,247
MSD	860,749	824,213	843,105	853,781	853,252
E-MSW	877,868	873,138	873,337	883,818	880,572
G-MSW	876,834	870,077	870,723	881,983	878,653
E-MSWW	875,422	875,577	874,417	883,668	880,315
G-MSWW	874,129	872,426	871,619	882,293	878,706
E-MSD	875,925	875,352	874,150	883,552	879,953
G-MSD	874,628	872,080	871,363	881,921	878,365
MMRW	873,735	848,298	874,612	875,853	869,434
MMRWW	837,016	822,249	841,752	842,154	840,750
MMRD	853,572	833,208	855,617	856,515	854,339
E-MMRW	867,620	876,341	872,312	879,143	874,700
G-MMRW	867,789	871,501	870,280	876,953	873,967
E-MMRWW	867,622	876,504	872,200	879,035	875,296
G-MMRWW	867,534	871,198	869,457	876,653	874,069
E-MMRD	867,491	876,541	872,684	879,155	875,173
G-MMRD	867,609	871,356	870,348	876,858	874,266
AMRW	904,937	860,257	883,204	893,080	889,873
AMRWW	874,725	867,857	874,760	881,699	877,986
AMRD	885,667	864,568	877,235	885,924	883,828
E-AMRW	882,832	881,330	880,084	890,730	887,137
G-AMRW	882,262	878,325	877,711	888,974	885,962
E-AMRWW	880,755	881,639	880,388	889,946	885,607
G-AMRWW	879,460	878,044	877,376	887,917	884,489
E-AMRD	881,048	881,765	880,418	890,102	885,782
G-AMRD	879,891	877,987	877,366	887,887	884,335
eAMRw	894,923	892,592	894,294	904,360	898,996
eAMRwc	887,319	883,743	884,183	893,894	889,050
eMMRw	851,866	843,205	858,435	859,831	855,558
eMMRwc	875,909	888,920	885,319	889,595	885,796
gAMRw	893,153	889,648	891,434	902,081	897,193
gAMRwc	886,715	881,952	882,606	892,846	888,372
gMMRw	851,558	841,504	857,403	859,219	855,010
gMMRwc	876,060	888,319	884,704	889,584	885,925
IAMRw	881,859	865,734	879,952	881,040	879,852
IAMRwc	874,772	855,996	870,479	872,330	871,451
IMMRw	813,087	794,482	822,768	815,701	815,650
IMMRwc	843,417	844,522	857,444	851,287	852,604
AMRwc	851,189	881,447	880,509	889,762	885,274
MMRwc	761,846	876,285	872,197	878,823	875,082

Maximax u1 N=6 調和平均

	A	B	C	D	E
EV	819,716	837,750	819,176	832,012	813,155
GM	823,506	836,615	819,992	833,479	812,489
MSW	829,892	797,025	807,330	814,894	816,522
MSWW	833,695	826,847	824,351	832,161	824,823
MSD	836,156	813,616	817,985	827,483	822,440
E-MSW	857,145	871,421	852,956	863,556	859,242
G-MSW	863,052	870,962	855,920	866,475	859,741
E-MSWW	856,643	874,666	855,527	864,561	859,348
G-MSWW	863,279	874,645	858,820	868,194	859,888
E-MSD	856,644	873,937	854,664	864,465	858,935
G-MSD	862,915	873,740	857,533	867,806	859,539
MMRW	869,368	788,034	840,382	846,575	821,036
MMRWW	841,938	765,596	812,226	819,588	802,637
MMRD	855,070	777,186	825,331	832,122	811,354
E-MMRW	872,316	883,018	871,119	877,054	871,499
G-MMRW	878,107	883,206	874,239	880,533	873,978
E-MMRWW	871,305	885,173	871,618	877,151	871,954
G-MMRWW	877,853	885,474	874,722	881,283	875,130
E-MMRD	871,538	885,001	871,837	877,362	872,138
G-MMRD	877,861	885,340	874,811	881,049	875,101
AMRW	891,915	854,034	865,489	877,725	865,325
AMRWW	880,332	874,493	870,054	881,584	866,030
AMRD	885,963	869,172	869,963	882,974	867,440
E-AMRW	865,882	880,704	862,632	873,109	867,656
G-AMRW	872,079	881,272	865,680	876,499	868,896
E-AMRWW	864,582	881,922	863,149	872,654	866,823
G-AMRWW	871,058	882,470	866,602	876,194	867,999
E-AMRD	864,547	881,770	862,960	872,489	866,978
G-AMRD	870,697	882,239	866,215	875,752	867,844
eAMRw	900,696	898,053	889,161	906,823	888,510
eAMRwc	871,903	885,046	869,386	881,086	870,324
eMMRw	853,373	764,980	821,952	828,352	805,655
eMMRwc	870,021	887,048	873,752	879,658	873,656
gAMRw	900,550	895,541	887,481	905,335	885,628
gAMRwc	876,141	885,275	871,460	883,021	871,066
gMMRw	853,596	764,875	822,392	828,417	805,531
gMMRwc	872,901	887,288	875,123	880,748	875,199
IAMRw	878,075	852,390	864,365	868,147	857,579
IAMRwc	845,977	838,120	842,453	841,774	839,773
IMMRw	814,484	732,435	790,926	789,036	775,314
IMMRwc	833,865	831,994	838,952	834,753	842,345
AMRwc	867,130	883,408	866,386	877,537	868,333
MMRwc	874,362	888,236	876,107	883,011	875,762

minimax-regret u1 N=6 調和平均

	A	B	C	D	E
EV	84,388	83,147	84,058	83,941	83,279
GM	84,887	83,090	84,225	84,024	83,393
MSW	86,763	81,695	84,922	84,922	84,571
MSWW	84,488	82,412	83,779	83,142	83,427
MSD	86,008	82,134	84,483	84,784	84,253
E-MSW	87,449	86,795	87,124	87,152	87,092
G-MSW	87,730	86,434	87,151	87,025	86,982
E-MSWW	87,461	86,871	87,155	87,285	87,097
G-MSWW	87,652	86,623	87,067	87,166	87,034
E-MSD	87,493	86,841	87,151	87,261	87,101
G-MSD	87,680	86,575	87,022	87,115	87,025
MMRW	86,523	80,620	85,030	85,301	85,025
MMRWW	82,628	78,059	81,347	81,601	82,712
MMRD	84,256	79,327	82,929	82,708	83,818
E-MMRW	87,414	87,488	87,623	87,724	87,519
G-MMRW	87,712	87,129	87,798	87,634	87,554
E-MMRWW	87,490	87,594	87,692	87,797	87,646
G-MMRWW	87,806	87,277	87,742	87,738	87,661
E-MMRD	87,453	87,616	87,662	87,771	87,679
G-MMRD	87,781	87,287	87,747	87,717	87,661
AMRW	90,218	85,451	88,383	88,211	87,963
AMRWW	87,541	85,961	87,003	86,741	86,913
AMRD	88,530	85,862	87,686	87,276	87,357
E-AMRW	87,977	87,302	87,738	87,723	87,563
G-AMRW	88,283	87,066	87,704	87,625	87,499
E-AMRWW	87,821	87,374	87,736	87,691	87,498
G-AMRWW	88,098	87,137	87,640	87,581	87,468
E-AMRD	87,839	87,374	87,740	87,719	87,504
G-AMRD	88,112	87,127	87,647	87,605	87,454
eAMRw	89,340	88,361	88,905	89,007	88,835
eAMRwc	88,444	87,776	88,338	88,196	87,776
eMMRw	84,124	80,109	82,728	83,406	84,002
eMMRwc	87,253	88,420	88,062	88,082	87,924
gAMRw	89,248	88,077	88,641	88,784	88,683
gAMRwc	88,630	87,678	88,286	88,090	87,796
gMMRw	84,043	80,015	82,666	83,278	83,949
gMMRwc	87,450	88,290	88,142	88,148	88,044
IAMRw	87,168	85,526	86,762	86,045	86,521
IAMRwc	86,423	84,682	86,188	85,214	85,340
IMMRw	79,629	75,098	78,713	78,099	79,511
IMMRwc	83,286	83,409	84,484	83,458	84,653
AMRwc	87,935	87,558	87,891	87,825	87,473
MMRwc	87,594	87,750	87,769	87,863	87,608

maximin u2 N=6 調和平均

	A	B	C	D	E
EV	627,593	586,421	623,086	621,567	610,848
GM	637,404	587,753	629,331	626,314	618,804
MSW	735,519	657,288	707,950	715,477	722,038
MSWW	713,643	683,677	714,148	710,167	713,191
MSD	728,252	666,470	710,199	716,732	721,943
E-MSW	764,091	736,588	759,189	765,718	766,297
G-MSW	764,094	734,824	757,794	764,466	764,276
E-MSWW	759,285	749,074	762,539	764,034	765,218
G-MSWW	758,846	746,863	761,326	763,223	763,756
E-MSD	760,155	745,995	761,594	764,225	764,824
G-MSD	759,740	743,757	760,186	763,032	763,492
MMRW	838,735	832,820	837,869	855,114	843,866
MMRWW	814,870	838,629	826,170	835,833	829,595
MMRD	822,806	831,309	828,814	840,503	834,084
E-MMRW	797,066	794,281	805,453	813,152	808,297
G-MMRW	797,405	792,237	805,202	811,652	809,346
E-MMRWW	801,731	799,803	809,746	815,580	811,093
G-MMRWW	803,004	798,431	810,131	815,066	812,490
E-MMRD	800,850	799,268	809,431	815,348	810,740
G-MMRD	801,520	797,720	809,168	814,013	811,603
AMRW	806,964	734,301	779,126	790,723	789,021
AMRWW	774,550	769,072	783,147	781,312	780,687
AMRD	786,751	752,463	780,082	784,844	786,523
E-AMRW	775,288	750,363	773,084	779,658	779,318
G-AMRW	775,501	749,209	772,098	778,398	779,155
E-AMRWW	771,715	759,741	775,659	777,664	777,058
G-AMRWW	771,632	758,288	774,573	776,400	777,374
E-AMRD	772,014	758,656	775,361	777,795	777,242
G-AMRD	771,873	756,832	774,020	776,254	776,988
eAMRw	834,805	795,145	834,596	829,881	818,001
eAMRwc	805,524	754,436	806,289	793,663	785,672
eMMRw	854,883	844,199	852,405	866,981	850,538
eMMRwc	832,847	810,215	841,224	837,252	827,209
gAMRw	833,687	793,162	833,801	828,081	816,197
gAMRwc	806,977	753,471	807,708	793,982	785,355
gMMRw	854,063	843,440	852,098	865,747	849,232
gMMRwc	834,188	810,485	842,591	838,537	827,475
IAMRw	837,243	798,353	835,964	828,329	819,885
IAMRwc	804,827	745,959	804,581	788,561	782,064
IMMRw	845,828	839,984	843,678	861,587	849,923
IMMRwc	835,013	812,744	842,389	843,713	836,610
AMRwc	800,061	759,246	803,727	790,610	784,173
MMRwc	826,353	796,196	831,645	827,551	817,657

Maximax u2 N=6 調和平均

	A	B	C	D	E
EV	570,630	607,753	579,995	598,650	584,710
GM	562,147	606,782	575,255	595,000	577,248
MSW	687,601	658,448	671,717	684,733	687,819
MSWW	637,474	680,206	651,764	664,019	655,760
MSD	657,292	670,734	657,157	674,549	673,294
E-MSW	707,329	734,383	709,702	726,607	729,864
G-MSW	699,942	732,840	705,425	723,783	723,320
E-MSWW	698,780	738,500	707,436	723,206	722,919
G-MSWW	689,812	737,793	702,529	719,881	715,541
E-MSD	700,060	736,965	707,197	723,762	723,763
G-MSD	691,491	736,244	702,325	720,360	716,684
MMRW	826,861	779,659	823,140	839,271	809,121
MMRWW	823,015	775,803	816,459	833,795	813,292
MMRD	818,709	776,030	816,187	832,093	806,594
E-MMRW	752,197	788,916	764,954	778,310	776,222
G-MMRW	747,268	790,481	762,768	777,701	774,555
E-MMRWW	754,704	793,095	768,701	780,283	777,475
G-MMRWW	752,056	795,099	767,245	780,920	777,140
E-MMRD	754,012	792,701	768,437	779,944	777,260
G-MMRD	750,491	794,440	766,348	779,744	776,346
AMRW	776,888	725,029	758,592	774,278	764,062
AMRWW	721,968	757,765	740,945	758,131	741,453
AMRD	735,064	746,967	742,816	762,811	748,444
E-AMRW	719,515	749,633	724,683	741,794	743,166
G-AMRW	712,759	750,075	720,624	739,560	737,843
E-AMRWW	712,576	751,874	722,423	737,704	736,732
G-AMRWW	704,983	752,158	718,065	735,278	731,360
E-AMRD	713,135	751,636	722,505	737,933	737,490
G-AMRD	705,698	751,676	718,208	735,236	731,822
eAMRw	784,264	774,966	777,673	838,078	803,782
eAMRwc	705,803	744,877	703,826	745,448	739,339
eMMRw	875,646	771,499	853,524	901,125	833,336
eMMRwc	768,849	789,683	768,855	799,654	789,681
gAMRw	772,665	772,668	768,599	830,364	797,415
gAMRwc	696,677	744,834	696,900	740,615	735,213
gMMRw	874,824	770,987	853,286	899,897	832,376
gMMRwc	768,022	789,880	768,818	799,571	789,848
IAMRw	807,023	763,419	806,170	839,184	799,195
IAMRwc	720,462	723,389	728,662	746,440	730,838
IMMRw	883,180	773,495	865,677	900,462	836,777
IMMRwc	801,574	787,877	806,679	822,320	808,433
AMRwc	693,841	745,081	693,138	734,621	732,313
MMRwc	748,471	786,198	748,522	788,156	780,805

minimax-regret u2 N=6 調和平均

	A	B	C	D	E
EV	62,461	60,629	61,745	61,425	61,335
GM	63,079	60,680	62,163	61,658	61,716
MSW	69,301	64,875	68,406	67,672	67,853
MSWW	68,047	65,994	67,988	66,819	67,099
MSD	69,036	65,280	68,117	68,080	67,565
E-MSW	71,941	70,509	71,470	71,424	71,958
G-MSW	71,988	70,309	71,638	71,270	71,769
E-MSWW	71,801	70,691	71,349	71,348	71,925
G-MSWW	71,677	70,518	71,448	71,197	71,764
E-MSD	71,828	70,610	71,391	71,289	71,921
G-MSD	71,734	70,429	71,459	71,150	71,737
MMRW	80,804	77,884	80,985	81,122	78,234
MMRWW	78,417	77,669	79,623	79,810	77,818
MMRD	79,313	77,556	80,031	79,844	77,970
E-MMRW	75,825	76,105	76,021	76,424	76,358
G-MMRW	75,766	75,936	76,423	76,407	76,477
E-MMRWW	76,334	76,468	76,371	76,667	76,692
G-MMRWW	76,488	76,382	76,673	76,668	76,822
E-MMRD	76,263	76,494	76,286	76,698	76,656
G-MMRD	76,325	76,438	76,556	76,633	76,784
AMRW	76,958	72,351	75,882	75,177	74,449
AMRWW	73,819	73,807	74,169	73,728	73,665
AMRD	74,850	72,883	74,814	74,191	73,794
E-AMRW	73,114	71,913	72,724	72,741	73,053
G-AMRW	73,223	71,794	72,803	72,638	72,965
E-AMRWW	72,860	72,181	72,567	72,598	72,987
G-AMRWW	72,811	72,014	72,606	72,464	72,877
E-AMRD	72,910	72,135	72,584	72,618	72,977
G-AMRD	72,867	71,969	72,605	72,450	72,854
eAMRw	76,783	76,033	76,727	76,953	76,017
eAMRwc	73,249	72,044	72,779	72,759	72,765
eMMRw	80,467	78,976	80,936	81,632	78,456
eMMRwc	76,400	77,221	77,106	76,795	76,620
gAMRw	76,586	75,811	76,588	76,674	75,906
gAMRwc	73,268	71,892	72,838	72,636	72,713
gMMRw	80,340	78,893	80,896	81,436	78,384
gMMRwc	76,530	77,222	77,288	76,859	76,654
IAMRw	77,170	76,173	77,577	76,950	76,327
IAMRwc	73,446	70,864	72,957	72,095	72,296
IMMRw	80,036	78,675	80,626	80,645	78,540
IMMRwc	77,288	77,583	77,883	77,716	78,400
AMRwc					
MMRwc					

順位付け簡単な場合u1

	maximin					Maximax					regret				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
EV	40	37	42	40	42	42	32	39	37	37	37	33	37	36	41
GM	37	38	41	39	41	41	33	38	34	38	35	34	36	35	40
MSW	25	42	37	35	33	40	37	42	42	36	31	37	33	33	34
MMRW	24	32	18	31	32	21	38	32	31	35	32	38	32	31	32
MMRWW	41	41	39	42	40	36	40	41	41	42	42	42	42	42	42
E-MMRWW	27	15	24	26	24	17	9	10	16	10	23	9	17	10	11
3-MMRWW	30	25	32	30	29	9	6	6	7	5	14	16	12	12	10
G-MMRD	29	24	30	29	28	8	7	5	9	6	15	15	11	16	9
AMRW	1	30	6	4	3	3	29	20	13	23	1	30	3	3	4
AMRD	6	29	16	15	15	4	28	14	5	19	5	28	18	23	22
eAMRw	2	1	1	1	1	1	1	1	1	1	2	2	1	1	1
eAMRwc	4	5	5	3	4	15	10	15	8	13	6	5	4	4	7
eMMRw	34	34	33	33	34	34	41	37	39	40	39	39	40	38	36
eMMRwc	18	3	3	10	9	20	5	8	12	8	29	1	7	7	5
gAMRw	3	2	2	2	2	2	2	2	2	2	3	4	2	2	2
gAMRwc	5	6	7	5	5	10	8	11	3	12	4	7	5	6	6
gMMRw	35	35	35	34	35	33	42	36	38	41	40	40	41	39	37
gMMRwc	16	4	4	11	8	12	4	4	10	4	26	3	6	5	3
IAMRw	9	28	12	23	19	7	30	21	25	30	30	29	30	30	30
IAMRwc	20	31	29	32	31	35	31	31	32	32	33	31	31	32	31
IMMRw	42	43	43	43	43	43	43	43	43	43	43	43	43	43	43
IMMRwc	39	33	34	38	38	38	34	33	33	31	41	32	34	37	33
AMRwc	36	9	8	9	12	22	12	17	14	15	11	10	8	9	19
MMRwc	43	17	25	27	26	11	3	3	4	3	20	6	10	8	12

順位付け困難な場合u2

	maximin					Maximax					regret				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
EV	43	43	43	43	43	42	42	42	42	42	41	41	41	41	41
GM	42	42	42	42	42	43	43	43	43	43	40	40	40	40	40
MSW	39	41	41	40	39	39	41	39	39	39	37	39	37	38	37
MMRW	4	5	7	4	4	4	11	4	4	5	1	4	1	3	5
MMRWW	13	4	13	9	7	5	13	5	7	4	6	5	6	6	7
E-MMRWW	19	10	15	14	16	14	3	12	15	14	15	11	16	15	10
G-MMRWW	18	12	14	16	14	17	1	15	14	16	13	13	12	14	8
G-MMRD	20	14	17	17	15	18	2	16	17	17	16	12	14	16	9
AMRW	15	38	26	22	20	10	37	19	20	20	9	21	19	19	19
AMRD	25	28	25	25	21	21	27	21	21	21	20	20	20	20	20
eAMRw	7	16	9	10	11	9	14	9	6	8	10	16	11	8	17
eAMRwc	16	26	19	21	22	29	29	34	24	24	24	24	25	22	28
eMMRw	1	1	1	1	1	2	17	2	1	2	2	1	2	1	2
eMMRwc	10	9	6	8	9	12	7	10	11	12	14	9	10	11	13
gAMRw	9	18	10	12	13	11	16	13	9	10	11	18	13	13	18
gAMRwc	14	27	18	20	23	35	30	37	26	28	23	28	23	25	29
gMMRw	2	2	2	2	3	3	18	3	3	3	3	2	3	2	4
gMMRwc	8	8	4	7	8	13	6	11	12	11	12	8	9	10	12
IAMRw	5	13	8	11	10	7	19	8	5	9	8	14	8	9	16
IAMRwc	17	34	22	24	25	23	38	23	23	32	22	30	22	30	30
IMMRw	3	3	3	3	2	1	15	1	2	1	4	3	4	4	1
IMMRwc	6	7	5	5	5	8	9	7	10	6	7	6	7	7	3
AMRwc	22	22	23	23	24	36	28	38	32	29	19	10	20	13	13
MMRwc	11	15	11	13	12	19	10	20	13	13					

考察：全体を通して、安定して高い精度を出せているのは平均の順位が高い順に eAMRw,gAMRw,gMMRwc の3手法
これらの手法は従来の B のケースで精度が下がる AMRW や MMRW の特性を克服し、全体を通して高い精度を維持できている

② 派生手法の実装 従来の MMRw,AMRw 手法に、w/c の考え方を導入 MMRw/c,AMRw/c とした