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LAMPIRAN

Lampiran 1. Pengujian Algoritma SMO dengan swap rate (0,2)

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
1	666	678	666	692	666	666	680	666	666	666
2	680	666	689	692	666	666	666	688	678	666
3	693	666	693	692	666	678	666	678	666	666
4	666	678	666	692	678	678	678	666	666	668
5	709	711	678	678	666	678	666	666	666	666
6	688	666	692	666	692	678	679	666	666	666
7	715	666	666	666	666	666	666	666	666	666
8	666	666	666	689	666	710	666	697	675	666
9	689	666	666	666	678	666	695	678	666	666
10	666	678	678	666	678	678	666	666	666	678
11	693	666	666	666	667	668	666	678	666	666
12	666	695	678	678	688	666	666	666	667	666
13	678	666	666	666	688	666	666	666	666	666
14	695	688	666	666	666	666	666	666	695	666
15	676	666	666	684	677	689	666	667	666	668
16	666	679	666	666	666	666	688	666	666	668
17	666	666	666	666	666	666	666	666	666	685
18	685	691	666	666	688	722	666	678	666	666
19	666	689	666	666	678	666	666	666	666	666
20	691	675	666	666	678	666	666	688	666	666
21	702	668	668	666	666	666	666	666	695	678
22	716	666	666	666	678	711	678	666	666	666
23	672	668	666	678	666	666	666	678	666	666
24	686	666	666	684	666	666	682	666	666	666
25	688	688	695	695	703	666	688	666	666	676
26	675	678	716	666	666	666	666	666	666	667
27	666	674	688	666	688	688	695	678	688	666
28	689	699	695	666	688	666	691	666	666	666
29	688	678	666	666	678	666	666	666	666	678
30	703	688	666	666	678	688	700	688	678	666
31	674	678	678	678	666	666	666	666	666	678
32	666	667	666	666	666	666	666	678	666	668
33	707	716	666	666	666	678	678	666	678	666
34	675	667	678	666	678	666	688	666	666	678

Lampiran 1. Pengujian Algoritma SMO dengan swap rate 0,2 (lanjutan)

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
35	695	666	666	666	666	668	667	666	685	678
36	712	666	666	678	666	666	666	678	666	666
37	666	666	678	666	666	666	666	666	666	666
38	668	666	666	688	688	673	675	678	666	666
39	684	666	666	689	666	666	666	688	678	666
40	666	666	695	678	666	666	666	682	678	666
41	677	666	666	666	666	673	669	666	666	666
42	702	667	666	666	668	666	666	666	667	666
43	666	666	667	666	668	666	678	670	666	666
44	666	666	676	688	675	666	666	666	666	666
45	689	695	678	688	666	670	666	666	666	666
46	666	666	700	688	685	666	666	678	673	666
47	666	666	666	666	689	666	666	666	666	678
48	672	692	666	666	666	666	678	666	666	666
49	679	667	688	666	666	667	666	688	666	666
50	675	666	666	666	666	666	666	666	666	666
Rata-rata	681,52	674,72	673,76	673,5	673,4	672,14	671,98	671,64	669,54	668,44

Lampiran 2 Pengujian Algoritma Genetika dengan mutation rate 0,2

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
1	695	691	671	670	678	680	687	676	674	666
2	666	678	687	695	679	666	686	678	666	689
3	698	692	700	670	669	678	666	678	686	666
4	711	692	680	693	683	686	678	678	681	666
5	681	686	693	674	666	682	690	683	666	672
6	692	696	678	687	680	673	666	703	671	678
7	666	701	690	666	678	666	666	686	666	670
8	692	699	666	668	685	689	672	671	666	667
9	691	699	666	694	670	683	670	669	685	666
10	682	697	686	682	675	675	672	676	677	666
11	691	692	680	666	678	669	678	669	666	674
12	699	678	689	675	680	679	675	667	668	672
13	698	678	687	679	680	675	683	667	671	666
14	703	668	678	675	666	666	674	674	666	675
15	666	688	688	674	677	678	666	703	666	675
16	681	704	683	670	672	686	677	675	676	666
17	696	690	678	678	679	680	666	703	667	675
18	696	683	690	680	683	693	675	674	666	672
19	715	684	687	672	673	686	672	678	675	671
20	670	683	666	677	690	666	674	676	671	678
21	705	686	690	679	676	675	692	675	666	671
22	689	698	680	683	673	675	684	669	676	666
23	699	678	683	671	666	670	669	685	703	674
24	690	678	694	685	676	675	672	685	666	666
25	673	698	689	686	678	675	666	685	666	669
26	685	670	692	666	680	676	675	675	678	666
27	705	683	678	693	668	667	677	669	666	666
28	690	676	687	678	682	678	680	669	682	666
29	707	706	696	677	692	677	675	678	678	666
30	666	700	677	669	672	673	678	670	703	669
31	711	686	668	687	677	675	676	703	687	678
32	686	666	666	676	666	670	669	670	672	675
33	699	678	675	675	683	674	678	670	672	680
34	692	666	686	668	666	666	679	669	676	666
35	680	693	675	695	675	679	677	666	666	666

Lampiran 2 Pengujian Algoritma Genetika dengan mutation rate 0,2 (lanjutan)

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
36	689	675	684	666	672	668	683	675	666	666
37	699	684	698	684	689	683	666	666	666	666
38	697	673	685	694	680	676	683	666	675	682
39	701	682	680	666	667	679	675	674	680	680
40	675	696	681	688	678	672	673	666	680	675
41	716	689	692	666	683	678	678	675	684	703
42	701	674	686	666	686	666	680	666	676	668
43	704	677	672	672	680	666	675	678	677	669
44	671	705	682	695	680	680	689	670	703	678
45	697	693	688	683	675	686	669	666	667	675
46	691	672	681	680	673	666	675	669	675	689
47	700	671	696	677	672	693	666	673	674	678
48	689	684	676	678	691	666	676	666	667	678
49	705	696	684	687	676	684	686	668	666	668
50	693	690	683	684	666	666	669	678	666	678
Rata-rata	691,9	686	682,9	678,4	676,8	675,8	675,7	675,6	674,2	672,5

Lampiran 3 Pengujian Algoritma SMO-Graycode dengan swap rate 0,2

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
1	688	678	666	666	666	678	666	666	666	666
2	688	666	678	666	666	666	666	666	667	678
3	672	688	680	666	666	666	666	666	678	678
4	666	678	666	714	688	666	666	666	666	668
5	693	666	675	714	676	666	666	666	678	666
6	678	678	690	714	678	666	666	666	666	666
7	689	668	666	676	702	666	666	666	666	666
8	704	668	666	666	666	666	666	666	666	666
9	666	709	666	666	666	666	689	666	666	666
10	678	666	688	666	666	666	666	666	666	666
11	684	677	673	689	666	666	668	666	666	666
12	717	689	666	666	703	666	666	666	666	666
13	678	666	666	678	666	667	678	666	666	666
14	680	666	681	666	666	666	678	666	666	666
15	698	715	668	666	684	666	666	666	666	666
16	686	689	666	666	666	666	666	666	666	666
17	666	666	672	666	678	666	666	666	666	666
18	711	678	684	666	688	666	666	666	666	666
19	666	666	666	666	666	678	666	666	668	666
20	666	680	688	666	666	666	692	666	666	666
21	697	666	666	668	666	666	667	666	666	666
22	677	666	684	693	666	688	666	668	666	666
23	668	666	686	688	666	673	666	666	666	666
24	666	692	678	666	666	695	678	685	666	678
25	666	666	678	666	689	666	674	666	666	666
26	687	666	666	666	668	666	666	689	666	666
27	666	673	666	695	678	666	688	666	666	666
28	666	689	669	666	666	666	671	678	666	666
29	678	668	666	666	666	666	666	688	676	666
30	672	666	666	678	666	666	666	666	666	666
31	692	666	702	666	666	666	666	666	666	666
32	710	666	666	666	691	678	666	666	666	666
33	715	666	677	666	678	666	666	666	666	666
34	666	692	682	666	666	702	666	666	666	666
35	690	666	666	666	695	678	666	666	688	666

Lampiran 3 Pengujian Algoritma SMO-Graycode dengan swap rate 0,2 (lanjutan)

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
36	666	688	678	678	666	666	666	668	666	666
37	666	684	666	695	666	666	678	666	678	666
38	668	666	666	667	666	666	678	666	666	666
39	666	666	666	666	666	678	688	666	678	668
40	708	666	666	671	666	678	666	678	666	666
41	716	666	666	666	666	676	666	666	666	666
42	666	666	666	666	666	666	666	666	678	666
43	666	670	678	666	666	690	666	666	666	666
44	678	666	666	666	666	678	666	688	666	666
45	706	666	669	682	668	678	666	666	666	666
46	690	675	667	684	667	666	666	667	666	666
47	666	669	676	666	678	666	684	678	666	667
48	669	689	678	678	678	668	666	666	666	666
49	685	684	710	678	666	666	666	666	688	666
50	689	688	666	666	666	666	666	688	666	666
Rata-rata	681,9	674,8	673,46	673,72	671,98	670,54	669,74	668,98	668,34	666,82

Lampiran 4 Pengujian Algoritma Genetika Graycode dengan mutation rate 0,2

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
1	693	692	683	680	683	675	666	666	666	667
2	686	686	675	686	666	675	676	672	675	666
3	712	677	687	674	689	675	674	677	666	682
4	677	690	666	678	678	672	670	669	669	671
5	671	705	679	674	666	666	669	680	666	666
6	681	691	680	687	678	666	675	666	666	666
7	694	694	675	680	678	666	669	671	668	666
8	687	681	678	673	666	678	672	667	666	678
9	707	695	666	680	669	666	675	666	688	666
10	686	682	666	666	690	680	683	666	669	669
11	696	698	678	666	675	673	666	666	666	666
12	680	666	676	666	675	666	666	675	672	669
13	667	687	680	666	668	687	685	692	680	676
14	688	689	666	688	687	666	684	666	687	671
15	683	696	690	676	675	666	666	673	675	666
16	687	688	666	666	666	686	686	684	666	666
17	666	672	672	677	681	674	677	666	675	666
18	689	686	687	692	666	675	674	666	677	687
19	698	699	694	666	678	685	674	668	668	666
20	702	695	684	671	680	677	673	682	666	673
21	695	677	686	669	675	672	666	671	666	680
22	680	686	685	688	670	666	670	684	672	670
23	703	677	671	684	668	666	692	684	672	666
24	698	698	666	677	685	666	677	666	680	689
25	679	700	682	666	684	678	666	668	675	671
26	706	666	688	687	666	678	666	666	666	671
27	685	686	696	680	681	666	680	685	672	687
28	699	675	692	674	680	666	694	666	675	669
29	686	678	687	687	671	671	686	666	666	678
30	682	677	686	683	680	683	680	675	675	666
31	674	675	684	672	680	674	674	670	674	666
32	666	698	675	674	669	666	678	667	666	672
33	683	705	677	671	666	678	678	666	671	677
34	675	691	666	686	681	675	666	689	671	680
35	697	678	689	677	666	682	675	677	666	666

Lampiran 4 Pengujian Algoritma Genetika Graycode dengan mutation rate 0,2 (lanjutan)

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
36	686	696	678	680	668	680	672	686	666	666
37	708	668	687	685	666	672	677	666	672	666
38	695	675	690	680	691	675	666	679	671	670
39	698	694	675	675	686	687	677	673	687	675
40	687	670	679	666	670	677	688	685	677	675
41	672	683	670	675	666	666	680	687	684	675
42	686	678	676	666	677	688	678	666	668	666
43	699	693	699	666	683	681	666	675	675	675
44	678	689	697	683	678	674	678	684	666	668
45	712	692	687	670	666	685	666	666	669	675
46	710	687	673	680	668	677	675	680	666	666
47	698	693	690	685	686	666	673	669	681	666
48	697	697	682	678	669	680	666	682	666	666
49	690	716	686	699	676	675	680	671	666	666
50	704	680	674	678	666	675	675	680	676	678
Rata-rata	689,56	686,94	680,42	677,06	675,04	674,38	674,9	673,74	671,76	671,28

Lampiran 5 Pengujian Algoritma SMO dengan swap rate 0,5

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
1	666	666	678	688	689	678	666	690	666	666
2	680	677	678	666	666	666	666	678	718	666
3	688	677	667	666	678	666	666	666	666	687
4	678	677	666	696	666	666	666	689	666	666
5	673	677	666	668	666	666	666	666	670	666
6	690	698	674	667	690	676	689	666	666	666
7	679	699	707	666	668	666	666	699	668	666
8	695	684	684	666	678	707	666	675	695	666
9	708	666	678	695	666	666	692	678	666	707
10	691	688	666	707	666	678	672	678	666	689
11	701	666	678	678	707	678	676	666	666	678
12	678	716	693	666	666	666	666	666	666	666
13	708	684	666	666	678	707	666	678	678	666
14	678	692	678	666	701	666	689	678	678	666
15	708	666	678	707	671	666	666	666	666	678
16	666	666	690	688	680	678	678	666	666	695
17	708	678	666	668	678	678	676	678	707	666
18	666	666	690	683	666	666	688	675	678	666
19	678	666	707	678	666	666	680	675	666	666
20	666	678	678	666	666	674	695	666	678	678
21	667	671	666	666	666	666	666	692	666	666
22	666	679	678	678	678	666	681	678	666	678
23	708	666	707	678	707	678	666	666	666	666
24	695	666	666	707	666	666	666	666	667	666
25	708	692	687	666	695	666	666	666	666	666
26	666	671	699	668	670	666	678	678	666	666
27	697	678	678	673	682	678	666	678	666	678
28	666	678	666	666	688	678	666	666	666	668
29	666	672	671	667	666	711	666	666	678	667
30	718	672	678	666	710	678	688	666	666	666
31	708	666	678	666	715	682	728	666	666	666
32	715	666	678	695	666	693	666	666	666	666
33	689	678	666	666	700	678	678	666	666	678
34	666	678	693	678	667	689	689	679	666	666
35	683	683	666	666	666	678	666	678	689	678

Lampiran 5 Pengujian Algoritma SMO dengan swap rate 0,5

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
36	689	678	685	688	666	679	666	666	678	666
37	678	678	678	666	666	686	666	666	666	666
38	677	678	666	666	666	666	666	666	666	666
39	708	678	666	666	666	675	666	666	678	666
40	666	688	666	715	666	666	692	678	666	666
41	678	684	678	678	688	688	666	666	689	666
42	666	708	677	666	684	682	676	666	666	678
43	668	708	703	695	666	666	667	666	678	668
44	666	708	670	715	666	678	666	666	688	666
45	666	708	666	678	678	666	666	678	666	666
46	695	666	711	666	682	668	666	666	666	666
47	666	672	689	688	668	688	666	688	666	666
48	708	667	678	666	680	666	666	666	678	666
49	692	678	666	680	666	678	668	715	666	666
50	689	678	685	678	666	666	666	666	673	666
Rata-rata	684,7	679,6	678,98	677,36	676,56	675,42	673,2	673,22	672,24	670,3

Lampiran 6 Pengujian algoritma genetika dengan mutation rate 0,5

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
1	722	693	691	677	702	691	697	683	669	692
2	716	678	710	677	702	689	678	694	692	685
3	706	690	710	677	696	701	678	680	689	673
4	710	686	708	677	696	678	686	679	690	692
5	727	707	672	679	696	672	704	704	696	700
6	694	719	698	676	693	690	693	704	690	693
7	690	699	723	692	684	690	672	680	683	684
8	724	699	692	717	679	705	690	690	678	666
9	698	718	701	708	695	693	697	688	696	692
10	721	704	695	710	681	683	673	680	688	686
11	690	692	712	690	674	688	688	666	698	691
12	682	689	702	705	720	696	701	666	675	692
13	727	693	688	681	693	693	666	687	708	669
14	744	685	705	689	709	666	666	680	690	679
15	711	691	706	696	709	683	678	690	686	685
16	716	696	698	688	709	694	676	670	705	678
17	692	704	687	718	709	699	677	699	673	703
18	708	707	681	709	709	684	688	690	667	672
19	716	718	708	698	688	683	699	689	683	684
20	693	684	693	691	695	713	696	690	687	690
21	720	710	694	678	672	713	682	689	666	682
22	708	694	707	685	695	713	690	687	713	683
23	724	708	666	671	708	671	686	689	696	680
24	711	694	711	704	709	675	688	704	678	689
25	724	679	676	707	682	687	698	704	685	678
26	693	687	711	700	703	675	693	704	689	692
27	729	698	689	700	703	671	694	691	680	684
28	709	690	704	704	703	684	683	690	679	666
29	710	707	696	690	703	675	666	678	675	666
30	705	700	683	713	702	694	683	681	690	666
31	718	710	696	709	692	683	680	666	693	684
32	714	731	709	698	693	693	675	680	674	666
33	704	706	704	678	700	683	666	681	675	686
34	702	730	710	699	690	709	699	691	679	683
35	692	707	710	702	683	709	700	692	666	686

Lampiran 6 Pengujian algoritma genetika dengan mutation rate 0,5 (lanjutan)

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
36	728	690	695	701	707	701	704	690	689	686
37	687	699	706	710	688	701	704	675	687	678
38	715	714	681	704	699	705	692	666	688	686
39	696	708	691	694	682	685	696	687	692	678
40	723	701	700	705	677	707	690	694	696	681
41	699	695	678	712	697	666	702	704	677	695
42	708	671	690	694	694	689	671	704	674	689
43	725	706	703	694	697	695	704	686	687	692
44	695	696	704	697	687	675	704	682	687	690
45	739	691	681	698	680	687	685	671	687	684
46	690	702	685	698	673	702	699	686	690	684
47	715	689	699	679	675	702	699	696	677	680
48	702	726	675	693	693	702	692	704	699	680
49	723	709	693	700	712	702	714	682	687	696
50	705	701	703	718	680	678	675	704	689	693
Rata-rata	710	700,02	696,6	695,8	694,36	690,46	688,34	687,34	685,74	683,78

Lampiran 7 Pengujian Algoritma SMO graycode dengan swap rate 0,5

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
1	666	666	680	666	666	666	667	666	680	667
2	666	666	666	666	679	668	666	668	666	666
3	710	666	692	666	678	666	678	666	666	666
4	676	666	666	689	688	688	666	666	666	666
5	675	666	680	678	666	666	666	699	670	666
6	698	666	680	678	679	688	666	678	666	666
7	666	666	721	666	666	666	666	666	666	666
8	666	696	666	666	666	666	666	666	666	666
9	695	710	666	667	666	666	666	666	666	666
10	666	678	678	666	680	675	678	666	666	695
11	706	666	666	666	666	666	690	667	666	666
12	666	699	678	707	666	666	700	666	666	666
13	668	666	666	666	670	666	666	675	666	666
14	700	666	666	667	678	666	666	683	666	666
15	740	666	668	666	667	666	666	666	678	666
16	705	678	689	678	666	666	666	666	666	666
17	666	692	669	666	666	678	692	666	666	666
18	666	666	666	666	666	666	666	666	666	666
19	696	666	666	666	666	666	666	666	666	678
20	666	666	666	696	692	666	666	678	666	666
21	672	708	670	680	666	678	666	666	666	678
22	678	666	666	666	673	674	666	666	667	666
23	700	666	678	666	666	666	666	678	666	667
24	666	699	666	670	666	718	678	666	666	666
25	692	731	666	666	666	678	689	666	678	666
26	706	715	668	688	666	706	666	666	678	678
27	680	666	710	666	688	666	667	688	668	666
28	666	695	666	678	666	666	666	678	666	666
29	673	691	694	678	678	676	666	666	666	666
30	670	674	672	684	668	678	666	666	666	666
31	666	678	666	666	666	666	666	666	666	692
32	705	702	666	688	667	667	666	667	666	692
33	666	666	668	666	689	668	666	676	666	666
34	674	666	666	677	666	666	666	666	678	666
35	680	666	677	666	666	666	666	666	678	678

Lampiran 7 Pengujian Algoritma SMO graycode dengan swap rate 0,5 (lanjutan)

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
36	680	668	675	689	666	678	666	666	678	666
37	679	695	667	680	678	668	688	676	666	678
38	666	689	678	678	711	666	673	666	666	666
39	673	692	678	684	678	666	666	692	666	666
40	666	673	678	666	666	678	678	673	678	666
41	666	666	710	678	678	666	666	666	678	666
42	666	666	666	666	668	666	666	666	702	666
43	666	666	710	673	692	673	706	678	666	666
44	675	666	666	666	668	666	666	666	666	666
45	700	666	666	678	666	666	666	666	688	666
46	680	666	683	666	666	666	666	678	666	666
47	668	666	666	666	666	673	666	666	667	669
48	700	678	666	696	682	673	666	666	688	666
49	666	689	671	668	673	666	666	666	666	666
50	666	675	666	678	666	666	666	678	678	666
Rata-rata	679,48	677,74	674,8	673,78	672,36	671,26	670,52	670,44	670,2	668,92

Lampiran 8 pengujian algoritma genetika graycode dengan mutation rate 0,5

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
1	708	704	700	688	690	708	668	686	683	696
2	734	708	705	689	682	675	666	689	669	666
3	704	697	702	694	666	690	666	695	680	666
4	707	701	688	694	666	686	666	689	686	680
5	733	713	689	701	702	684	666	702	690	693
6	701	719	720	694	714	698	703	695	674	666
7	702	704	696	684	686	704	691	666	700	666
8	698	700	708	668	666	704	685	672	695	696
9	719	689	695	686	666	688	695	691	669	682
10	726	697	705	694	666	666	708	702	678	696
11	734	707	684	703	694	691	688	678	675	666
12	693	717	698	692	683	690	681	680	666	666
13	716	697	678	705	702	669	676	686	666	696
14	731	698	675	668	683	690	688	682	677	678
15	735	708	698	668	713	688	675	685	680	675
16	694	693	692	666	692	690	697	689	686	693
17	695	711	719	707	666	695	691	683	686	686
18	697	697	684	692	666	672	698	675	690	689
19	730	726	666	696	696	672	697	671	675	666
20	718	702	681	696	693	697	701	689	689	686
21	723	686	712	699	701	684	666	687	684	680
22	703	712	710	695	692	692	682	676	675	680
23	697	709	682	695	672	689	700	678	689	683
24	727	704	687	697	693	690	695	687	690	678
25	730	695	686	685	700	696	688	670	678	666
26	712	697	679	709	689	698	683	685	678	666
27	701	690	707	688	693	666	694	693	695	685
28	715	686	687	701	699	695	710	693	666	684
29	715	704	674	695	697	700	682	675	666	699
30	681	694	716	675	695	672	675	687	690	687
31	727	710	712	705	684	677	688	689	690	688
32	737	704	687	679	666	672	666	666	675	686
33	727	706	682	675	692	689	691	668	678	666
34	730	729	678	698	681	708	671	666	692	668
35	710	723	707	691	694	678	681	709	687	680

Lampiran 8 pengujian algoritma genetika graycode dengan mutation rate 0,5 (lanjutan)

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
36	677	710	680	684	711	684	673	666	666	690
37	715	684	678	695	693	677	675	666	666	687
38	715	720	702	699	677	698	698	704	690	671
39	718	680	699	705	689	683	683	682	700	688
40	716	706	690	694	700	672	692	678	678	697
41	737	694	689	694	693	679	689	675	679	689
42	686	715	700	686	690	701	707	686	689	704
43	702	704	686	678	680	696	687	704	680	693
44	697	722	690	699	694	679	675	691	686	689
45	707	725	702	696	703	674	708	681	680	666
46	709	702	704	686	684	685	668	670	707	689
47	735	698	666	698	676	694	678	686	666	667
48	698	680	695	671	705	689	695	693	684	666
49	708	691	691	700	703	690	682	687	692	675
50	717	692	704	695	696	702	710	686	669	666
Rata-rata	712,94	703,2	693,3	691,04	688,68	687,32	685,96	683,78	681,58	680,82

Lampiran 9 Pengujian algoritma SMO dengan swap rate 0,8

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
1	692	666	698	689	678	716	692	666	666	678
2	716	666	680	696	666	691	666	711	666	668
3	680	666	690	678	678	693	678	667	666	666
4	688	666	678	698	716	715	688	674	666	674
5	731	678	688	706	695	666	666	666	666	668
6	678	716	677	666	666	678	666	688	688	666
7	695	678	669	716	718	666	666	690	666	666
8	716	666	716	669	666	666	669	666	678	666
9	666	680	680	715	666	666	716	673	666	666
10	678	690	692	666	666	666	688	666	668	666
11	716	688	678	698	666	666	666	666	683	666
12	666	678	693	666	716	666	666	688	666	666
13	688	732	666	666	716	666	666	666	695	666
14	716	730	716	666	668	666	684	678	666	698
15	716	682	666	679	684	678	678	666	689	666
16	688	666	693	666	679	696	716	680	667	698
17	668	676	666	689	666	716	666	711	666	666
18	710	696	666	666	668	710	666	666	689	666
19	689	666	666	666	666	666	666	666	666	698
20	716	722	716	666	688	669	678	666	666	666
21	717	666	686	668	675	716	666	715	666	690
22	711	666	688	687	678	695	666	666	688	666
23	666	694	684	666	716	666	716	666	666	678
24	666	718	669	716	688	704	684	732	666	678
25	716	666	706	716	715	684	666	666	666	666
26	666	722	666	668	666	671	681	678	678	666
27	677	716	688	673	669	666	677	666	671	666
28	680	667	718	691	666	716	671	666	682	690
29	715	679	688	716	716	688	678	678	666	666
30	666	666	678	688	692	672	678	675	666	673
31	725	666	674	678	685	666	666	666	689	666
32	708	696	718	668	716	680	666	678	666	666
33	716	686	672	716	678	666	690	666	680	693
34	666	678	688	666	693	698	695	666	697	666
35	678	682	715	716	710	667	666	666	678	688

Lampiran 9 Pengujian algoritma SMO dengan swap rate 0,8 (lanjutan)

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
36	716	666	678	666	688	666	678	666	677	682
37	688	736	679	714	666	666	667	666	666	666
38	675	731	692	666	689	668	731	683	689	678
39	715	678	670	716	666	666	678	678	666	666
40	671	693	693	666	670	715	676	715	666	666
41	666	706	666	716	666	695	669	666	666	670
42	695	680	678	666	689	666	716	688	666	668
43	696	666	666	666	666	666	688	666	710	666
44	666	678	678	699	666	731	668	675	678	699
45	678	682	695	666	716	666	680	666	666	666
46	708	705	716	666	666	668	666	666	667	695
47	694	675	666	678	678	666	666	666	688	682
48	687	718	716	716	666	669	666	666	690	689
49	716	678	678	666	677	666	666	666	685	689
50	715	715	679	689	680	688	704	672	666	666
Rata-rata	693,44	687,66	685,64	684,32	682,88	680,78	678,64	675,5	674,4	674,12

Lampiran 10 Pengujian algoritma genetika dengan mutation rate 0,8

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
1	728	740	696	744	734	709	713	717	699	715
2	776	729	739	716	707	732	718	706	703	720
3	753	754	715	744	734	708	739	730	700	727
4	788	727	726	733	754	741	731	703	703	710
5	732	704	754	691	716	727	712	706	716	722
6	776	763	747	690	740	747	716	701	712	710
7	753	739	737	753	690	731	706	737	736	716
8	712	742	716	743	707	710	709	735	717	698
9	774	730	770	736	678	710	713	741	709	707
10	745	718	730	736	703	709	687	736	730	697
11	749	732	732	732	712	698	731	722	736	731
12	755	739	732	740	726	728	695	693	728	701
13	789	746	726	730	724	707	722	732	709	693
14	755	726	729	711	713	732	716	696	725	721
15	751	734	748	756	726	739	712	716	718	718
16	725	741	735	758	722	717	728	711	696	729
17	762	770	727	737	756	720	715	721	675	732
18	753	732	735	719	728	708	745	712	718	710
19	762	741	746	675	736	696	729	739	721	735
20	724	686	753	746	745	751	740	725	715	722
21	731	756	666	727	689	725	729	698	712	727
22	741	754	728	742	710	736	716	689	722	714
23	762	737	701	747	739	711	720	708	711	720
24	734	722	714	735	751	714	722	698	729	736
25	732	724	757	715	727	731	690	702	710	717
26	728	738	719	700	719	688	703	695	746	696
27	758	712	746	731	703	727	715	721	704	719
28	738	718	743	699	710	731	724	687	726	719
29	771	723	690	683	706	700	726	711	714	697
30	730	743	732	723	766	725	703	727	702	707
31	698	710	742	742	738	693	717	734	698	705
32	737	715	697	735	736	705	703	717	740	699
33	724	728	713	744	712	708	692	715	712	726
34	772	754	745	737	717	736	715	710	727	734
35	756	716	737	700	726	716	718	720	731	706

Lampiran 10 Pengujian algoritma genetika dengan mutation rate 0,8 (lanjutan)

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
36	751	717	727	711	727	707	691	708	717	719
37	743	743	700	720	718	718	715	712	718	706
38	771	719	736	724	699	728	707	684	708	703
39	755	721	686	698	698	710	726	719	701	731
40	739	743	711	746	747	695	732	717	686	695
41	753	753	738	719	721	701	730	700	725	717
42	736	741	742	737	706	711	686	711	698	692
43	740	762	713	729	722	731	732	722	740	715
44	763	751	719	721	718	727	730	731	703	666
45	754	729	762	736	698	717	729	729	727	713
46	763	732	747	743	726	711	681	712	725	724
47	735	772	731	749	711	733	701	708	728	707
48	719	769	717	738	716	733	742	719	725	721
49	751	726	719	716	718	676	712	700	715	710
50	706	739	741	728	732	720	702	689	706	727
Rata-rata	747,06	735,2	728,24	727,3	721,14	717,68	715,72	713,44	715,44	713,64

Lampiran 11 Pengujian algoritma SMO graycode dengan swap rate 0,8

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
1	682	666	681	690	666	666	666	695	678	719
2	666	671	691	695	666	666	666	716	678	666
3	668	666	679	668	678	666	666	678	666	688
4	666	692	666	666	679	676	670	675	695	666
5	666	668	710	698	692	666	666	688	666	703
6	666	723	716	678	666	666	666	695	669	692
7	684	667	666	666	666	688	666	682	666	678
8	671	688	715	695	693	666	666	684	666	690
9	703	666	678	666	693	668	666	666	666	666
10	716	677	693	668	688	666	682	666	694	666
11	666	696	666	678	688	666	667	666	666	678
12	678	678	695	688	688	704	715	666	666	666
13	666	695	680	666	666	666	683	666	666	673
14	666	695	688	666	678	666	678	666	678	688
15	695	666	678	671	684	684	684	688	672	666
16	666	668	678	666	666	678	668	666	683	666
17	698	673	666	666	677	666	666	666	666	666
18	731	669	700	708	695	678	666	696	675	689
19	680	666	695	699	666	666	666	679	666	666
20	690	666	666	695	695	683	666	666	692	666
21	684	688	666	678	677	670	668	666	666	666
22	689	666	666	715	692	666	666	692	666	678
23	689	695	666	689	666	666	690	666	688	678
24	666	678	666	666	666	666	716	666	678	666
25	695	676	688	666	666	666	666	666	678	666
26	673	688	666	690	678	696	666	666	688	666
27	666	693	706	666	666	692	684	678	678	666
28	710	692	666	666	679	689	666	667	691	666
29	666	718	699	678	678	666	684	666	666	687
30	724	701	666	666	666	666	709	678	678	666
31	666	689	676	666	688	666	678	692	666	666
32	724	688	666	721	678	679	666	666	666	666
33	678	683	690	667	697	698	666	666	666	666
34	666	666	666	682	666	666	668	666	678	666
35	689	666	666	671	666	703	721	677	695	666

Lampiran 11 Pengujian algoritma SMO graycode dengan swap rate 0,8 (lanjutan)

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
36	693	688	666	704	666	666	666	669	666	666
37	666	679	678	710	666	677	689	678	666	666
38	666	684	666	666	693	678	721	666	666	666
39	731	666	688	666	673	666	666	666	666	666
40	668	666	666	668	680	688	670	666	670	666
41	680	708	666	706	690	666	666	726	666	667
42	710	685	711	666	666	704	689	668	680	695
43	666	666	669	695	666	731	666	666	666	666
44	684	678	666	688	666	666	668	678	678	688
45	689	668	666	666	688	706	666	690	667	666
46	668	710	678	680	715	667	680	666	684	666
47	697	682	680	672	688	678	666	666	689	667
48	678	679	666	666	666	666	678	684	678	698
49	666	724	666	678	666	666	666	666	666	678
50	666	666	724	689	688	688	678	678	666	673
Rata-rata	682,74	681,84	679,64	680	677,92	676,38	675,76	675,62	673,92	673,74

Lampiran 12 pengujian algoritma genetika graycode dengan mutation rate 0,8

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
1	704	748	720	740	730	728	739	713	703	718
2	772	735	725	730	725	725	710	719	723	715
3	772	744	745	704	678	722	741	710	721	719
4	766	753	738	719	701	742	738	706	699	725
5	773	744	749	734	728	721	736	713	700	708
6	747	754	727	711	745	718	706	693	731	709
7	778	718	732	728	722	746	727	700	722	731
8	754	726	757	687	708	705	687	695	720	735
9	739	753	751	724	704	704	727	722	735	744
10	785	754	723	741	709	735	696	714	721	727
11	800	735	735	737	739	700	736	739	723	717
12	757	749	722	732	743	729	732	716	682	733
13	761	768	755	718	724	719	753	734	680	705
14	741	755	743	714	748	748	754	721	729	722
15	738	765	686	755	677	686	732	704	709	737
16	761	744	730	742	737	722	729	716	718	707
17	741	721	743	744	735	733	731	716	714	721
18	748	741	723	729	717	696	717	693	695	711
19	774	723	739	747	718	728	704	695	719	729
20	766	740	757	727	738	726	727	710	710	730
21	736	716	714	719	686	705	686	706	718	714
22	750	715	723	748	751	711	734	723	684	718
23	751	755	755	710	723	713	732	727	698	720
24	725	733	736	692	727	710	719	718	706	709
25	720	749	752	708	724	693	717	738	732	705
26	773	719	749	744	695	709	716	678	740	718
27	744	745	734	733	734	727	705	702	722	713
28	785	754	701	752	699	730	732	723	724	709
29	729	745	700	726	727	705	711	723	732	708
30	766	758	731	745	738	734	699	709	704	720
31	780	754	731	732	716	742	732	728	703	703
32	749	741	727	739	708	735	718	737	718	699
33	746	720	721	698	737	729	700	741	705	728
34	713	744	736	718	744	708	717	700	720	691
35	747	732	722	736	740	715	728	728	709	699

Test	P = 100	P = 200	P = 300	P = 400	P = 500	P = 600	P = 700	P = 800	P = 900	P = 1000
36	740	747	701	722	741	719	728	709	722	699
37	749	740	739	712	723	698	719	710	716	699
38	732	705	718	740	704	732	722	750	708	718
39	751	754	736	727	737	719	686	709	718	701
40	724	765	727	714	747	721	713	703	731	699
41	767	728	741	751	721	736	728	709	717	716
42	767	751	732	715	733	720	712	714	727	740
43	769	734	744	730	731	702	714	709	720	695
44	734	751	762	743	727	725	701	699	726	673
45	744	737	745	748	747	729	729	733	673	699
46	761	750	728	746	743	717	699	720	730	699
47	727	709	698	740	710	749	694	735	725	735
48	759	750	720	733	725	733	734	680	719	712
49	739	743	766	689	719	699	699	719	708	713
50	736	725	725	716	729	710	733	726	714	699
Rata-rata	751,8	740,78	732,28	727,78	724,24	720,16	719,58	714,7	714,46	713,88

Lampiran 13

Ft06 (SMO)

CHROMOSOME: [0, 2, 1, 1, 0, 2, 3, 1, 4, 5, 4, 4, 2, 3, 3, 5, 5, 0, 3, 1, 0, 2, 3, 5, 1, 0, 5, 1, 4, 0, 5, 3, 4, 4, 2, 2]

GANTT DIAGRAM:

M-0 -000-----33333222222222-55555555551111111111444
M-1 111111113333355500000444--2
M-2 022222--1111144444444433333-----5
M-3 -----2222-----555---000000333-----11114
M-4 -----1111111111--444442222223333333555000000
M-5 -----2222222-555555555111111111444400033333333

Ft06(GA)

CHROMOSOME: [0, 1, 0, 3, 2, 2, 1, 4, 5, 4, 2, 5, 1, 3, 0, 5, 3, 2, 5, 2, 3, 1, 4, 1, 3, 0, 4, 5, 0, 2, 5, 3, 4, 1, 4, 0]

GANTT DIAGRAM:

M-0 -----000----33333222222222-55555555551111111111444
M-1 1111111133333555-----4440000002
M-2 222220--1111144444444433333-----5
M-3 -----2222-----555-----333-0000000-----41111
M-4 -----1111111111--4444433333333555222222000000
M-5 -----2222222-5555555551111111114444000333333333

Ft06(SMO-Graycode)

GRAYCODE : [00000001, 00000011, 00000011, 00000000, 00000011, 00000010, 00000111, 00000111, 00000000, 00000001, 00000010, 00000001, 00000110, 00000000, 00000111, 00000110, 00000110, 00000011, 00000011, 00000111, 00000010, 00000011, 00000001, 00000000, 00000110, 00000010, 00000001, 00000001, 00000010, 00000000, 00000110, 00000111, 00000111, 00000010, 00000110, 00000000]

GANTT DIAGRAM:

M-0 -000-----33333222222222-55555555551111111111444
M-1 1111111133333555000000444--2
M-2 022222--1111144444444433333-----5
M-3 -----2222-----555---0000000333-----11114
M-4 -----1111111111--444442222223333333555000000
M-5 -----2222222-55555555511111111114444000333333333

Ft06(GA-GrayCode)

GRAYCODE : [00000001, 00000010, 00000011, 00000011, 00000000, 00000111, 00000111, 00000001, 00000000, 00000011, 00000111, 00000001, 00000110, 00000001, 00000110, 00000010, 00000010, 00000010, 00000011, 00000000, 00000000, 00000111, 00000000, 00000110, 00000010, 00000001, 00000110, 00000011, 00000111, 00000010, 00000110, 00000011, 00000001, 00000110, 00000000, 00000111]

GANTT DIAGRAM:

M-0 -----000-----3333322222222255555555551111111111444
M-1 1111111155533333000000444-----2
M-2 222220--1111144444444433333-----5
M-3 ----2222--555-----3330000000-----11114
M-4 -----1111111111--444443333333222225555000000
M-5 -----2222222555555551111111111-0004444333333333

Representasi Individu Solusi terbaik pada dataset la01

La01 (SMO)

CHROMOSOME: [3, 9, 8, 7, 5, 0, 5, 2, 8, 2, 1, 9, 7, 1, 3, 9, 4, 0, 3, 3, 6, 8, 2, 7, 4, 8, 6, 1, 2, 9, 3, 5, 6, 2, 4, 9, 1, 6, 5, 8, 0, 7, 0, 6, 0, 5, 1, 7, 4, 4]

La01 (GA)

CHROMOSOME: [6, 9, 5, 8, 2, 8, 0, 3, 7, 4, 1, 7, 0, 4, 9, 6, 8, 6, 5, 4, 9, 5, 9, 7, 1, 4, 8, 2, 3, 3, 5, 8, 5, 7, 6, 0, 1, 7, 3, 1, 0, 2, 9, 4, 1, 0, 6, 3, 2, 2]

La01 (SMO-GrayCode)

CHROMOSOME: [00000000, 00000111, 00000010, 00000100, 00000101, 00000001, 00000111, 00001101, 00000001, 00000110, 00001101, 00000101, 00000100, 00001100, 00000011, 00001101, 00000101, 00001100, 00000111, 00000001, 00000110, 00001101, 00000010, 00000010, 00001100, 00000100, 00000000, 00000111, 00000000, 00000101, 00001100, 00000100, 00000101, 00000011, 00000111, 00000110, 00000001, 00001101, 00000110, 00000010, 00000011, 00000100, 00000000, 00000010, 00001100, 00000001, 00000011, 00000011, 00000110, 00000000]

La01 (GA-GrayCode)

CHROMOSOME: [00000111, 00000100, 00001101, 00000101, 00000001, 00000110, 00000000, 00000111, 00000101, 00000001, 00000010, 00000110, 00001100, 00000000, 00000010, 00000011, 00000101, 00000111, 00001100, 00000011, 00000100, 00000110, 00000011, 00000111, 00000001, 00000101, 00000100, 00001101, 00000100, 00000001, 00000001, 00000110, 00001101, 00000111, 00000010, 00000011, 00001100, 00000010, 00000101, 00000011, 00000000, 00001100, 00001100, 00001101, 00000110, 00000000, 00000100, 00000000, 00001101, 00000010]

Lampiran 14 Dataset**La01**

Lawrence 10x5 instance (Table 3, instance 1); also called (setf1) or (F1)

10 5

1 21 0 53 4 95 3 55 2 34

0 21 3 52 4 16 2 26 1 71

3 39 4 98 1 42 2 31 0 12

1 77 0 55 4 79 2 66 3 77

0 83 3 34 2 64 1 19 4 37

1 54 2 43 4 79 0 92 3 62

3 69 4 77 1 87 2 87 0 93

2 38 0 60 1 41 3 24 4 83

3 17 1 49 4 25 0 44 2 98

4 77 3 79 2 43 1 75 0 96

La08

Lawrence 15x5 instance (Table 4, instance 3); also called (setg3) or (G3)

15 5

3 92 2 94 0 12 4 91 1 7

2 21 1 19 0 87 3 11 4 66

1 14 3 13 0 75 4 16 2 20

2 95 4 66 0 7 1 77 3 7

2 34 4 89 3 6 1 45 0 15

4 88 3 77 2 20 1 53 0 76

4 9 3 27 0 52 1 88 2 74

3 69 2 52 0 62 1 88 4 98

3 90 0 62 4 9 2 61 1 52

4 5 2 54 3 59 0 88 1 15

0 41 1 50 4 78 3 53 2 23

0 38 4 72 2 91 3 68 1 71

0 45 3 95 4 52 2 25 1 6

3 30 1 66 0 23 4 36 2 17

2 95 0 71 3 76 1 8 4 88

La25

Lawrence 15x10 instance (Table 7, instance 5); also called (setb5) or (B5)

15 10

8 14 4 75 3 12 2 38 0 76 5 97 9 12 1 29 7 44 6 66
 5 38 3 82 2 85 4 58 6 87 9 89 0 43 1 80 7 69 8 92
 9 5 1 84 0 43 6 48 4 8 7 7 3 41 5 61 8 66 2 14
 2 42 1 8 0 96 5 19 4 59 7 97 9 73 8 43 3 74 6 41
 6 55 2 70 3 75 8 42 4 37 7 23 1 48 5 5 9 38 0 7
 8 9 2 72 7 31 0 79 5 73 3 95 4 25 6 43 9 60 1 56
 0 97 2 64 3 78 5 21 4 94 9 31 8 53 6 16 7 86 1 7
 3 86 7 85 9 63 0 61 2 65 4 30 5 32 1 33 8 44 6 59
 2 44 3 16 4 11 6 45 1 30 9 84 8 93 0 60 5 61 7 90
 7 36 8 31 4 47 6 52 0 32 5 11 2 28 9 35 3 20 1 49
 8 20 6 49 7 74 4 10 5 17 3 34 0 85 2 77 9 68 1 84
 1 85 5 7 8 71 6 59 4 76 0 17 3 29 2 17 7 48 9 13
 2 15 6 87 7 11 1 39 4 39 8 43 0 19 3 32 9 16 5 64
 6 32 2 92 5 33 8 82 1 83 7 57 9 99 4 91 3 99 0 8
 4 88 7 7 8 27 1 38 3 91 2 69 6 21 9 62 5 39 0 48

Abz5

Adams, Balas, and Zawack 10x10 instance (Table 1, instance 5)

10 10

4 88 8 68 6 94 5 99 1 67 2 89 9 77 7 99 0 86 3 92
 5 72 3 50 6 69 4 75 2 94 8 66 0 92 1 82 7 94 9 63
 9 83 8 61 0 83 1 65 6 64 5 85 7 78 4 85 2 55 3 77
 7 94 2 68 1 61 4 99 3 54 6 75 5 66 0 76 9 63 8 67
 3 69 4 88 9 82 8 95 0 99 2 67 6 95 5 68 7 67 1 86
 1 99 4 81 5 64 6 66 8 80 2 80 7 69 9 62 3 79 0 88
 7 50 1 86 4 97 3 96 0 95 8 97 2 66 5 99 6 52 9 71
 4 98 6 73 3 82 2 51 1 71 5 94 7 85 0 62 8 95 9 79
 0 94 6 71 3 81 7 85 1 66 2 90 4 76 5 58 8 93 9 97
 3 50 0 59 1 82 8 67 7 56 9 96 6 58 4 81 5 59 2 96

Abz6

Adams, and Zawack 10x10 instance (Table 1, instance 6)

10 10

7 62 8 24 5 25 3 84 4 47 6 38 2 82 0 93 9 24 1 66
 5 47 2 97 8 92 9 22 1 93 4 29 7 56 3 80 0 78 6 67
 1 45 7 46 6 22 2 26 9 38 0 69 4 40 3 33 8 75 5 96
 4 85 8 76 5 68 9 88 3 36 6 75 2 56 1 35 0 77 7 85
 8 60 9 20 7 25 3 63 4 81 0 52 1 30 5 98 6 54 2 86
 3 87 9 73 5 51 2 95 4 65 1 86 6 22 8 58 0 80 7 65
 5 81 2 53 7 57 6 71 9 81 0 43 4 26 8 54 3 58 1 69
 4 20 6 86 5 21 8 79 9 62 2 34 0 27 1 81 7 30 3 46
 9 68 6 66 5 98 8 86 7 66 0 56 3 82 1 95 4 47 2 78
 0 30 3 50 7 34 2 58 1 77 5 34 8 84 4 40 9 46 6 44

Ft06

Fisher and Thompson 6x6 instance, alternate name (mt06)

6 6

2 1 0 3 1 6 3 7 5 3 4 6
 1 8 2 5 4 10 5 10 0 10 3 4
 2 5 3 4 5 8 0 9 1 1 4 7
 1 5 0 5 2 5 3 3 4 8 5 9
 2 9 1 3 4 5 5 4 0 3 3 1
 1 3 3 3 5 9 0 10 4 4 2 1

Ft10

Fisher and Thompson 10x10 instance, alternate name (mt10)

10 10
 0 29 1 78 2 9 3 36 4 49 5 11 6 62 7 56 8 44 9 21
 0 43 2 90 4 75 9 11 3 69 1 28 6 46 5 46 7 72 8 30
 1 91 0 85 3 39 2 74 8 90 5 10 7 12 6 89 9 45 4 33
 1 81 2 95 0 71 4 99 6 9 8 52 7 85 3 98 9 22 5 43
 2 14 0 6 1 22 5 61 3 26 4 69 8 21 7 49 9 72 6 53
 2 84 1 2 5 52 3 95 8 48 9 72 0 47 6 65 4 6 7 25
 1 46 0 37 3 61 2 13 6 32 5 21 9 32 8 89 7 30 4 55
 2 31 0 86 1 46 5 74 4 32 6 88 8 19 9 48 7 36 3 79
 0 76 1 69 3 76 5 51 2 85 9 11 6 40 7 89 4 26 8 74
 1 85 0 13 2 61 6 7 8 64 9 76 5 47 3 52 4 90 7 45

Ft20

Fisher and Thompson 20x5 instance, alternate name (mt20)

20 5
 0 29 1 9 2 49 3 62 4 44
 0 43 1 75 3 69 2 46 4 72
 1 91 0 39 2 90 4 12 3 45
 1 81 0 71 4 9 2 85 3 22
 2 14 1 22 0 26 3 21 4 72
 2 84 1 52 4 48 0 47 3 6
 1 46 0 61 2 32 3 32 4 30
 2 31 1 46 0 32 3 19 4 36
 0 76 3 76 2 85 1 40 4 26
 1 85 2 61 0 64 3 47 4 90
 1 78 3 36 0 11 4 56 2 21
 2 90 0 11 1 28 3 46 4 30
 0 85 2 74 1 10 3 89 4 33
 2 95 0 99 1 52 3 98 4 43
 0 6 1 61 4 69 2 49 3 53
 1 2 0 95 3 72 4 65 2 25
 0 37 2 13 1 21 3 89 4 55
 0 86 1 74 4 88 2 48 3 79
 1 69 2 51 0 11 3 89 4 74
 0 13 1 7 2 76 3 52 4 45

Orb01

trivial 10x10 instance from Bill Cook (BIC2)

10 10

0 72 1 64 2 55 3 31 4 53 5 95 6 11 7 52 8 6 9 84
 0 61 3 27 4 88 2 78 1 49 5 83 8 91 6 74 7 29 9 87
 0 86 3 32 1 35 2 37 5 18 4 48 6 91 7 52 9 60 8 30
 0 8 1 82 4 27 3 99 6 74 5 9 2 33 9 20 7 59 8 98
 1 50 0 94 5 43 3 62 4 55 7 48 2 5 8 36 9 47 6 36
 0 53 6 30 2 7 3 12 1 68 8 87 4 28 9 70 7 45 5 7
 2 29 3 96 0 99 1 14 4 34 7 14 5 7 6 76 8 57 9 76
 2 90 0 19 3 87 4 51 1 84 5 45 9 84 6 58 7 81 8 96
 2 97 1 99 4 93 0 38 7 13 5 96 3 40 9 64 6 32 8 45
 2 44 0 60 8 29 3 5 6 74 1 85 4 34 7 95 9 51 5 47

Orb02

doomed 10x10 instance from Monika (MON2)

10 10

0 72 1 54 2 33 3 86 4 75 5 16 6 96 7 7 8 99 9 76
 0 16 3 88 4 48 8 52 9 60 6 29 7 18 5 89 2 80 1 76
 0 47 7 11 3 14 2 56 6 16 4 83 1 10 5 61 8 24 9 58
 0 49 1 31 3 17 8 50 5 63 2 35 4 65 7 23 6 50 9 29
 0 55 6 6 1 28 3 96 5 86 2 99 9 14 7 70 8 64 4 24
 4 46 0 23 6 70 8 19 2 54 3 22 9 85 7 87 5 79 1 93
 4 76 3 60 0 76 9 98 2 76 1 50 8 86 7 14 6 27 5 57
 4 93 6 27 9 57 3 87 8 86 2 54 7 24 5 49 0 20 1 47
 2 28 6 11 8 78 7 85 4 63 9 81 3 10 1 9 5 46 0 32
 2 22 9 76 5 89 8 13 6 88 3 10 7 75 4 98 1 78 0 17

#+++++

instance swv01

#+++++

#Storer, Wu, and Vaccari hard 20x10 instance (Table 2, instance 1)

20 10

3 19 2 27 1 39 4 13 0 25 8 37 9 40 5 54 7 74 6 93

2 69 0 30 4 1 3 4 1 64 7 71 5 2 9 84 6 31 8 8

4 79 3 80 0 86 2 55 1 54 8 81 6 72 7 86 5 59 9 75

2 76 3 15 1 26 0 17 4 30 8 44 7 91 6 83 5 52 9 68

4 73 3 87 1 74 0 39 2 98 9 100 5 43 8 17 7 7 6 77

1 63 0 49 2 16 3 55 4 9 9 73 5 61 8 34 6 82 7 46

0 87 1 71 4 43 3 80 2 39 7 70 8 18 6 41 9 79 5 44

4 70 2 22 0 73 3 62 1 64 5 25 8 19 6 69 9 41 7 28

3 16 0 84 1 58 4 7 2 9 5 8 6 10 7 17 8 42 9 65

3 8 0 10 1 3 4 41 2 3 7 40 8 56 5 53 9 96 6 13

4 62 1 60 3 64 2 12 0 39 5 2 7 64 6 87 9 21 8 60

2 66 1 71 3 23 4 75 0 78 7 74 6 35 9 24 8 23 5 50

1 5 3 92 4 6 0 69 2 80 7 13 5 17 9 89 6 80 8 47

0 82 3 84 1 24 2 47 4 93 7 85 5 34 6 73 8 28 9 91

4 55 0 57 3 63 2 24 1 40 7 30 6 37 5 99 8 88 9 41

1 75 2 47 3 68 0 7 4 78 7 80 6 2 9 23 8 49 5 50

0 91 4 25 2 10 1 21 3 94 8 6 7 59 5 84 9 75 6 70

2 85 1 31 0 94 4 94 3 11 5 21 9 7 6 61 8 50 7 93

1 27 0 77 4 13 2 30 3 2 5 88 7 4 9 39 6 53 8 54

1 34 2 12 3 31 0 24 4 24 7 16 5 6 9 88 8 81 6 11

#+++++

instance la40

#+++++

Lawrence 15x15 instance (Table 10, instance 5); also called (seti5) or (I5)

15 15

9 65 10 28 4 74 12 33 2 51 14 75 5 73 8 32 6 13 3 81 1 35 7 59 13 38 11 55 0 27
0 64 1 53 11 83 2 33 4 6 9 52 14 72 8 7 13 90 12 21 6 23 3 10 10 39 5 49 7 72
14 73 3 82 1 23 12 62 6 88 5 21 8 65 11 70 7 53 10 81 2 93 13 77 0 61 9 28 4 78
1 12 6 51 7 33 4 15 14 72 10 98 9 94 5 12 11 42 2 24 13 15 8 28 3 6 12 99 0 41
12 97 5 7 9 96 4 15 14 73 13 43 0 32 8 22 11 42 1 94 2 23 7 86 6 78 10 24 3 31
1 72 5 88 2 93 13 13 4 44 14 66 6 63 7 14 9 67 10 17 11 85 0 35 3 68 12 5 8 49
9 15 7 82 6 21 14 53 3 72 13 49 2 99 4 26 12 56 8 45 1 68 10 51 0 8 5 27 11 96
3 54 7 24 4 14 8 38 5 36 2 52 14 55 12 37 11 48 0 93 13 60 10 70 1 23 6 23 9 83
3 12 8 69 6 26 9 23 14 28 1 82 5 33 4 45 13 64 7 15 11 9 12 73 10 59 2 37 0 62
0 87 5 12 7 80 4 50 10 48 12 90 1 72 13 24 6 14 8 71 11 44 9 46 2 15 14 61 3 92
2 54 0 22 6 61 4 46 3 73 5 16 12 6 9 94 14 93 13 67 8 54 7 75 11 32 10 40 1 97
10 92 14 36 4 22 9 9 3 47 1 77 12 79 13 36 6 30 8 98 11 79 7 7 5 55 2 6 0 30
0 49 13 83 3 73 6 82 1 82 14 92 11 73 4 31 10 35 9 54 5 7 8 37 7 72 2 52 12 76
10 98 12 34 13 52 4 26 1 28 3 39 8 80 5 29 9 70 0 43 6 48 7 58 2 45 14 94 11 96
1 70 10 17 6 90 12 67 4 14 8 23 3 21 7 18 13 43 11 84 5 26 9 36 2 93 14 84 0 42

#+++++

instance la33

#+++++

Lawrence 30x10 instance, alternate name (mt06)

30 10

2 38 4 75 9 12 5 97 0 76 1 29 8 14 6 66 7 44 3 12

0 43 5 38 1 80 3 82 2 85 4 58 6 87 8 92 9 89 7 69

6 48 4 8 8 66 7 7 2 14 3 41 5 61 0 43 1 84 9 5

5 19 3 74 6 41 4 59 8 43 2 42 9 73 7 97 1 8 0 96

3 75 5 5 2 70 8 42 7 23 6 55 1 48 9 38 4 37 0 7

2 72 7 31 3 95 0 79 4 25 1 56 8 9 9 60 5 73 6 43

9 31 3 78 6 16 4 94 7 86 5 21 0 97 8 53 1 7 2 64

3 86 2 65 6 59 8 44 1 33 7 85 0 61 5 32 9 63 4 30

4 11 5 61 9 84 3 16 7 90 1 30 0 60 8 93 2 44 6 45

5 11 2 28 0 32 7 36 8 31 4 47 3 20 6 52 9 35 1 49

5 17 3 34 6 49 1 84 0 85 8 20 7 74 9 68 4 10 2 77

8 71 5 7 3 29 1 85 4 76 6 59 2 17 0 17 9 13 7 48

1 39 9 16 4 39 6 87 7 11 3 32 2 15 0 19 5 64 8 43

5 33 8 82 2 92 1 83 6 32 3 99 9 99 4 91 0 8 7 57

7 7 0 48 9 62 4 88 6 21 5 39 8 27 3 91 1 38 2 69

9 64 8 45 3 24 7 80 2 67 4 18 6 38 0 88 5 80 1 44

2 15 3 72 4 40 7 21 8 52 0 51 9 59 1 24 6 47 5 43

4 77 7 43 1 40 2 31 8 76 6 20 5 88 3 70 9 5 0 32

2 14 7 58 9 85 5 64 1 26 6 94 0 32 3 49 8 80 4 47

9 23 1 11 8 34 4 75 7 79 3 26 2 96 0 5 6 9 5 59

0 75 2 20 8 10 3 66 6 43 7 37 1 9 9 83 4 68 5 52

8 54 1 26 4 79 7 88 6 84 0 6 2 54 9 59 3 28 5 42

4 56 9 29 3 36 0 40 6 86 8 68 2 69 7 23 5 62 1 16

7 53 1 5 6 17 9 59 2 59 8 78 3 64 0 82 4 13 5 12

9 7 6 62 7 90 5 83 1 85 3 69 0 16 4 81 2 58 8 66

7 24 2 65 1 69 5 42 9 82 6 82 0 83 3 46 8 72 4 33
1 10 8 27 7 43 5 20 4 71 9 65 2 73 6 99 0 24 3 64
9 35 3 92 0 38 5 35 7 30 8 45 2 8 4 82 1 34 6 21
5 23 7 84 9 7 4 85 8 60 1 15 2 52 6 94 3 83 0 6
2 70 6 29 8 27 9 80 4 6 7 39 1 79 0 28 3 66 5 66

#+++++

instance yn1

#+++++

Yamada and Nakano 20x20 instance (Table 4, instance 1)

20 20

17 13 2 26 11 35 4 45 12 29 13 21 7 40 0 45 3 16 15 10 18 49 10 43 14 25 8 25 1

40 6 16 19 43 5 48 9 36 16 11

8 21 6 22 14 15 5 28 10 10 2 46 11 19 19 13 13 18 18 14 3 11 4 21 16 30 1 29 0

16 15 41 17 40 12 38 7 28 9 39

4 39 3 28 8 32 17 46 0 35 14 14 1 44 10 20 13 12 6 23 18 22 9 15 11 35 7 27 16

26 5 27 15 23 2 27 12 31 19 31

4 31 10 24 3 34 6 44 18 43 12 32 2 35 15 34 19 21 7 46 13 15 5 10 9 24 14 37 17

38 1 41 8 34 0 32 16 11 11 36

19 45 1 23 5 34 9 23 7 41 16 10 11 40 12 46 14 27 8 13 4 20 2 40 15 28 13 44 17

34 18 21 10 27 0 12 6 37 3 30

13 48 2 34 3 22 7 14 12 22 14 10 8 45 19 38 6 32 16 38 11 16 4 20 0 12 5 40 9

33 17 35 1 32 10 15 15 31 18 49

9 19 5 33 18 32 16 37 12 28 3 16 2 40 10 37 4 10 11 20 1 17 17 48 6 44 13 29 14

44 15 48 8 21 0 31 7 36 19 43

9 20 6 43 1 13 5 22 2 33 7 28 16 39 12 16 13 34 17 20 10 47 18 43 19 44 8 29 15

22 4 14 11 28 14 44 0 33 3 28

7 14 12 40 8 19 0 49 13 11 10 13 9 47 18 22 2 27 17 26 3 47 5 37 6 19 15 43 14

41 1 34 11 21 4 30 19 32 16 45

16 32 7 22 15 30 6 18 18 41 19 34 9 22 11 11 17 29 10 37 4 30 2 25 1 27 0 31 14

16 13 20 3 26 12 14 5 24 8 43

18 22 17 22 12 30 15 31 13 15 4 13 16 47 19 18 6 33 3 30 7 46 2 48 11 42 0 18 1

16 8 25 10 43 5 21 9 27 14 14

5 48 1 39 2 21 18 18 13 20 0 28 15 20 8 36 6 24 9 35 7 22 19 36 3 39 14 34 4 49

17 36 11 38 10 46 12 44 16 13

14 26 1 32 2 11 15 10 9 41 13 10 6 26 19 26 12 13 11 35 5 22 0 11 7 24 17 33 8
11 10 34 16 11 3 22 4 12 18 17
16 39 10 24 17 43 14 28 3 49 15 34 18 46 13 29 6 31 11 40 7 24 1 47 9 15 2 26 8
40 12 46 5 18 19 16 4 14 0 21
11 41 19 26 16 14 3 47 0 49 5 16 17 31 9 43 15 20 10 25 14 10 13 49 8 32 6 36 7
19 4 23 2 20 18 15 12 34 1 33
11 37 5 48 10 31 7 42 2 24 1 13 9 30 15 24 0 19 13 34 19 35 8 42 3 10 14 40 4
39 6 42 12 38 16 12 18 27 17 40
14 19 1 27 8 39 12 41 5 45 11 40 10 46 6 48 7 37 3 30 17 31 4 16 18 29 15 44 0
41 16 35 13 47 9 21 2 10 19 48
18 38 0 27 13 32 9 30 7 17 14 21 1 14 4 37 17 15 16 31 5 27 10 25 15 41 11 48 3
48 6 36 2 30 12 45 8 26 19 17
1 17 10 40 9 16 5 36 4 34 16 47 19 14 0 24 18 10 6 14 13 14 3 30 12 23 2 37 17
11 11 23 8 40 15 15 14 10 7 46
14 37 10 28 13 13 0 28 2 18 1 43 16 46 8 39 3 30 12 15 11 38 17 38 18 45 19 44 9
16 15 29 5 33 6 20 7 35 4 34

```

#####
# instance swv11
#####
# Storer, Wu, and Vaccari hard 50x10 instance (Table 2, instance 11)
50 10
0 92 4 47 3 56 2 91 1 49 5 39 9 63 7 12 6 1 8 37
0 86 2 100 1 75 3 92 4 90 5 11 7 85 8 54 9 100 6 38
1 4 4 94 3 44 2 40 0 92 8 53 6 40 9 5 5 68 7 27
4 87 0 48 1 59 2 92 3 35 6 99 7 46 9 27 8 83 5 91
0 83 1 78 4 76 3 64 2 44 8 12 9 91 6 31 7 98 5 63
3 49 0 15 1 100 4 18 2 24 6 92 9 65 5 26 7 29 8 24
0 28 3 53 4 84 2 47 1 85 7 100 5 34 6 35 8 90 9 88
2 61 4 71 3 54 1 34 0 13 9 47 8 2 6 97 7 27 5 97
0 85 2 75 1 33 4 72 3 49 7 23 5 12 8 90 6 87 9 42
2 24 3 20 1 65 4 33 0 75 9 47 6 84 8 44 7 74 5 29
2 48 3 27 4 1 0 23 1 66 6 35 7 46 9 29 5 63 8 44
2 79 0 4 4 61 3 46 1 69 7 10 8 88 9 19 6 50 5 34
0 16 4 31 3 77 2 3 1 25 8 88 7 97 9 49 6 79 5 22
1 40 0 39 4 15 2 93 3 48 6 63 9 74 8 46 7 91 5 51
4 48 0 93 2 8 3 50 1 5 6 48 7 46 9 35 5 88 8 97
3 70 1 8 2 65 0 32 4 84 8 9 6 43 7 10 5 72 9 60
0 21 2 28 1 26 3 91 4 58 9 90 6 43 8 64 5 39 7 93
1 50 2 60 0 51 4 90 3 93 7 20 9 33 8 27 6 12 5 89
1 21 3 3 2 47 4 34 0 53 9 67 8 8 5 68 7 1 6 71
3 57 4 26 2 36 0 48 1 11 9 44 7 25 5 30 8 92 6 57
1 20 0 20 4 6 3 74 2 48 9 77 8 15 5 80 7 27 6 10
3 71 1 40 0 86 2 23 4 29 7 99 8 56 6 100 9 77 5 28
4 83 0 61 3 27 1 86 2 99 7 31 5 60 8 40 9 84 6 26
4 68 1 94 3 46 2 60 0 33 7 46 5 86 9 63 6 70 8 89
4 33 1 13 2 91 3 27 0 38 8 82 7 31 6 23 9 27 5 87

```

4 58 3 30 0 24 2 12 1 38 8 2 9 37 5 59 6 37 7 36
2 62 1 47 4 5 3 39 0 75 7 60 9 65 8 61 6 77 5 31
4 100 0 21 1 53 3 74 2 3 8 34 6 6 7 91 9 80 5 28
1 8 0 3 2 88 3 54 4 18 9 4 6 34 5 54 8 59 7 42
3 33 4 72 0 83 2 17 1 23 6 24 8 60 9 96 7 78 5 70
4 63 2 36 3 70 0 97 1 99 6 71 9 92 5 41 8 73 7 97
2 28 1 37 4 24 0 30 3 55 8 38 5 9 9 77 7 17 6 51
3 15 0 46 2 14 4 18 1 99 9 48 6 41 5 10 7 47 8 80
4 89 3 78 2 51 1 63 0 29 7 70 9 7 5 14 8 84 6 32
4 26 1 69 2 92 3 15 0 23 8 42 6 95 5 47 9 83 7 56
1 38 2 44 3 47 4 23 0 10 9 63 7 65 6 21 5 70 8 56
3 42 4 85 1 29 0 35 2 66 9 46 8 25 5 90 7 85 6 75
3 99 0 46 4 74 2 96 1 48 5 52 6 13 7 88 8 4 9 30
1 15 3 80 4 47 2 25 0 8 9 61 7 70 8 23 6 93 5 5
0 90 2 51 3 66 4 5 1 86 5 59 6 97 9 28 7 85 8 9
0 59 1 50 4 40 3 23 2 93 7 61 9 96 8 63 6 34 5 14
1 62 2 72 4 30 0 21 3 15 5 77 6 13 7 2 8 22 9 22
2 20 4 14 3 85 1 4 0 2 9 33 7 90 5 48 8 90 6 62
0 49 3 49 4 46 1 89 2 64 9 72 8 6 5 83 6 13 7 66
4 74 1 55 2 73 0 25 3 16 7 19 9 38 6 22 5 26 8 63
3 13 2 96 1 8 0 15 4 97 6 95 7 2 5 66 8 57 9 46
4 73 1 97 3 39 0 22 2 90 9 64 6 65 8 31 5 98 7 85
3 43 2 67 0 38 1 77 4 11 7 61 5 7 9 95 8 97 6 69
0 35 2 68 1 5 3 46 4 4 7 51 6 44 5 58 9 69 8 98
2 68 1 81 0 2 3 4 4 59 9 53 8 69 5 69 6 14 7 21