COMPUTACIÓN NEURONAL Y EVOLUTIVA

Práctica 6

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Esta tarea era sobre programación genética. Hemos logrado obtener y editar los valores del archivo Beer_sales.csv. Debido a la falta del tiempo, la tarea no se ha completado.

A continuación se muestran las salidas de registro del programa.

Primary settings: Population=300cxp=**0.5** mutpb**=0.1** ngen=40

gen	nevals	avg	gen	max	min	nevals	std	avg	gen	max	min	nevals	std
0	300	inf	0	inf	1	300	nan	3.76667	0	7	2	300	1.67498
1	167	inf	1	inf	1	167	nan	3.90667	1	10	1	167	1.68462
2	163	5.68541	2	25	0	163	3.35296	4.41	2	10	1	163	1.78752
3	169	inf	3	inf	0	169	nan	4.57667	3	11	1	169	1.86301
4	159	3.2243	4	36	0	159	3.14043	4.72667	4	11	1	159	1.67091
5	181	inf	5	inf	0	181	nan	5.47333	5	14	1	181	1.83556
6	164	1.43879	6	25	0	164	2.47941	6.16	6	15	2	164	1.93935
7	160	1.37966	7	25	0	160	2.86879	6.88333	7	16	1	160	2.34302
8	161	0.738566	8	16	0	161	1.73096	7.40667	8	20	1	161	2.19118
9	155	0.978398	9	16	0	155	2.17485	7.55667	9	14	1	155	2.2361
10	168	0.759008	10	19.8889	0	168	1.96079	7.72	10	17	1	168	2.26604
11	170	0.907338	11	16	0	170	2.05943	7.81667	11	16	1	170	2.2188
12	165	0.785555	12	9	0	165	1.84844	7.84667	12	15	1	165	2.31585
13	189	1.05717	13	16	0	189	2.29325	7.86667	13	15	3	189	2.49444
14	155	inf	14	inf	0	155	nan	7.92667	14	17	1	155	2.686
15	177	0.713863	15	16	0	177	1.57238	7.98667	15	19	3	177	2.6204
16	159	0.832414	16	25	0	159	2.2065	8.05	16	17	3	159	2.50217
17	139	0.775863	17	16	0	139	1.94624	8.01667	17	19	3	139	2.79101
18	170	0.700755	18	25	0	170	2.49768	7.88333	18	20	1	170	2.48925
19	153	0.689098	19	16	0	153	2.1976	7.9	19	15	1	153	2.35726
20	161	nan	20	nan	nan	161	nan	7.97333	20	19	2	161	2.5559
21	156	inf	21	inf	0	156	nan	7.97	21	17	1	156	2.48108
22	134	inf	22	inf	0	134	nan	7.91667	22	17	1	134	2.36285
23	153	0.959206	23	49	0	153	3.46114	8.00667	23	19	2	153	2.50465
24	172	nan	24	nan	nan	172	nan	8.14667	24	17	1	172	2.6265
25	171	0.989913	25	16	0	171	2.50174	8.12667	25	17	1	171	2.68526
26	168	0.734372	26	25	0	168	2.39491	8.06667	26	17	1	168	2.61576
27	146	0.596832	27	9	0	146	1.36134	8.16667	27	21	3	146	2.58822
28	177	0.648368	28	9	0	177	1.42465	8.23333	28	18	3	177	2.48037
29	147	1.01979	29	36	0	147	3.537	8.09667	29	15	2	147	2.45234
30	160	0.905546	30	16	0	160	2.30501	8.08667	30	17	3	160	2.41919
31	170	0.673151	31	20.6143	0	170	1.77835	8.24	31	17	1	170	2.40882
32	164	0.965556	32	29.8083	0	164	2.53771	8.35333	32	18	3	164	2.59008
33	165	0.650186	33	12.5337	0	165	1.52724	8.35667	33	18	1	165	2.7036
34	189	inf	34	inf	0	189	nan	8.79	34	20	1	189	3.13676
35	167	inf	35	inf	0	167	nan	9.04333	35	20	1	167	3.18247
36	193	0.739331	36	9	0	193	1.66559	9.45667	36	21	1	193	3.42658
37	163	0.571103	37	16	0	163	1.86951	9.69667	37	20	1	163	3.47917
38	172	inf	38	inf	0	172	nan	9.64667	38	20	1	172	3.46051
39	152	inf	39	inf	0	152	nan	9.98	39	23	1	152	3.72732
40	170	nan	40	nan	nan	170	nan	9.72	40	25	2	170	3.49021

Population=200cxp=0.5 mutpb=0.1 ngen=40

gen	nevals	avg	gen	max	min	nevals	std	avg	gen	max	min	nevals	std
0	200	nan	0	nan	nan	200	nan	3.71	0	7	2	200	1.5414
1	106	nan	1	nan	nan	106	nan	4.035	1	9	1	106	1.68635
2	106	6.0517	2	40.9984	0.0890238	106	4.6953	4.505	2	10	1	106	1.71464
3	89	4.04693	3	77.5456	0	89	5.61627	4.725	3	12	1	89	1.88928
4	98	3.20548	4	34.232	0	98	4.04614	5.58	4	12	1	98	2.23464
5	107	inf	5	inf	0	107	nan	6.915	5	15	1	107	2.1066
6	112	inf	6	inf	0	112	nan	7.64	6	14	1	112	2.15184
7	114	2.50064	7	77.5456	0	114	8.50898	7.845	7	16	1	114	2.42301
8	101	2.95201	8	91.2492	0	101	8.65425	8.055	8	15	1	101	2.37318
9	103	1.83446	9	36	0	103	5.04162	8.305	9	17	3	103	2.55186
10	107	1.7656	10	36	0	107	5.57238	8.295	10	18	1	107	2.73459
11	106	inf	11	inf	0	106	nan	8.395	11	21	1	106	2.7819
12	104	inf	12	inf	0	104	nan	8.175	12	18	1	104	2.83802
13	126	2.37675	13	36	0	126	5.78774	8.335	13	16	1	126	2.74641
14	116	1.49628	14	16	0	116	3.34664	8.72	14	19	3	116	3.03341
15	125	1.9758	15	36	0	125	5.02953	8.46	15	19	1	125	2.75289
16	110	2.40269	16	36	0	110	5.84191	8.615	16	16	1	110	2.89944
17	105	1.79884	17	25	0	105	4.91176	8.755	17	18	3	105	2.28801
18	123	inf	18	inf	0	123	nan	8.8	18	17	1	123	2.69629
19	105	2.45436	19	64	0	105	6.92153	8.635	19	18	3	105	2.77881
20	112	1.19852	20	16	0	112	2.75272	8.215	20	19	1	112	2.74932
21	107	1.11826	21	25	0	107	3.12911	8.23	21	15	3	107	2.28847
22	116	inf	22	inf	0	116	nan	8.325	22	17	1	116	2.73119
23	108	1.11297	23	16	0	108	2.91413	8.33	23	20	1	108	2.71866
24	102	1.22964	24	25	0	102	3.29531	8.35	24	21	1	102	2.81381
25	107	1.03446	25	11.1131	0	107	2.07331	8.43	25	21	1	107	2.98079
26	111	1.11238	26	16	0	111	2.20754	8.525	26	23	1	111	3.21549
27	109	1.03444	27	16	0	109	2.66893	8.535	27	19	1	109	2.65495
28	127	1.9394	28	25	0	127	4.74988	8.505	28	16	1	127	2.71845
29	91	0.970404	29	25	0	91	3.02272	8.975	29	19	1	91	2.97395
30	109	1.32187	30	25	0	109	3.00922	9.21	30	22	1	109	3.32654
31	110	0.950423	31	25	0	110	2.55117	9.445	31	21	3	110	3.30408
32	136	1.41448	32	16	0	136	2.8578	9.485	32	21	1	136	3.62074
33	105	1.19935	33	9.97631	0	105	2.45654	9.705	33	21	3	105	3.02621
34	115	1.15703	34	25	0	115	3.53163	9.735	34	19	2	115	2.97906
35	92	0.663774	35	9	0	92	1.44441	9.675	35	20	3	92	3.37037
36	116	1.1701	36	25	0	116	2.83506	9.75	36	21	1	116	3.5493
37	109	1.02672	37	17.2934	0	109	2.79768	10.04	37	25	1	109	3.55083
38	117	0.958216	38	49	0	117	4.06602	9.98	38	25	3	117	3.73224
39	111	0.834914	39	25	0	111	2.66487	9.65	39	21	1	111	3.4623
40	107	0.792078	40	16	0	107	2.21581	10.19	40	20	3	107	3.33825

Population=100**cxp**=0.5 **mutpb**=0.1 **ngen=40**

gen	nevals	avg	gen	max	min	nevals	std	avg	gen	max	min	nevals	std
0	100	inf	0	inf	4	100	nan	3.44	0	7	2	100	1.50546
1	64	8.94926	1	25	4	64	4.80712	3.43	1	9	1	64	1.43007
2	50	6.07424	2	19.5024	4	50	3.07525	3.65	2	9	1	50	1.69337
3	59	4.34648	3	16	1	59	1.82115	3.58	3	13	1	59	1.78426
4	50	inf	4	inf	0	50	nan	4.29	4	14	1	50	2.49116
5	46	4.16028	5	16	0	46	2.3301	4.31	5	13	1	46	2.46453
6	58	3.60131	6	16	0	58	2.27508	4.75	6	11	1	58	2.45917
7	56	2.60688	7	11.9695	0	56	2.78117	6.44	7	11	2	56	2.65451
8	58	1.62571	8	14.7569	0	58	2.82582	8.48	8	14	3	58	2.30426
9	51	0.668711	9	16	0	51	2.26508	9.07	9	19	3	51	2.09883
10	64	0.614011	10	11.9695	0	64	1.51555	9.65	10	17	3	64	2.62821
11	54	0.873672	11	16	0	54	2.05245	9.55	11	17	3	54	3.03109
12	64	0.795711	12	11.6701	0	64	1.80099	9.27	12	20	3	64	2.78875
13	64	1.16211	13	36	0	64	3.9408	9.67	13	21	3	64	3.45559
14	52	0.588667	14	9	0	52	1.427	9.55	14	19	1	52	2.80491
15	63	0.769324	15	9	0	63	1.74714	9.33	15	19	1	63	3.19705
16	60	1.26374	16	16	0	60	3.05382	9.14	16	23	3	60	2.92582
17	52	0.544291	17	9	0	52	1.69842	8.89	17	17	1	52	2.60344
18	57	0.927497	18	11.6701	0	57	1.98073	9.37	18	20	3	57	2.99551
19	51	1.25197	19	25	0	51	3.26595	9.38	19	20	2	51	3.17736
20	56	inf	20	inf	0	56	nan	9.02	20	17	3	56	2.73123
21	60	0.710894	21	23.4398	0	60	2.53373	9.39	21	18	3	60	2.67168
22	62	1.40124	22	25	0	62	3.09783	8.9	22	17	1	62	3.30908
23	58	0.550079	23	9.97631	0	58	1.53058	8.82	23	15	3	58	2.22881
24	63	0.657305	24	16	0	63	1.8939	8.57	24	17	3	63	2.68423
25	52	0.299604	25	4.65925	0	52	0.786014	8.13	25	13	3	52	1.86363
26	47	0.754983	26	9	0	47	1.63941	8.07	26	17	1	47	2.73954
27	51	0.819244	27	16	0	51	2.33869	8.33	27	17	1	51	2.3877
28	56	0.863379	28	12.1494	0	56	1.9133	8.54	28	19	3	56	2.78718
29	61	inf	29	inf	0	61	nan	8.4	29	17	3	61	2.42074
30	49	1.33307	30	9	0	49	2.37816	8.16	30	15	1	49	2.71558
31	49	1.01133	31	9.97631	0	49	2.34512	8.23	31	21	1	49	2.98615
32	48	0.464613	32	9	0	48	1.29815	8.61	32	17	1	48	2.45314
33	57	0.537652	33	4	0	57	1.14504	9.18	33	15	3	57	2.52341
34	55	0.69527	34	16	0	55	2.19612	9.04	34	15	2	55	2.68298
35	59	0.863409	35	25	0	59	2.959	8.8	35	15	1	59	3.02324
36	53	0.973923	36	25	0	53	2.83117	9.41	36	17	3	53	3.28053
37	60	0.536726	37	9	0	60	1.30721	9.7	37	25	3	60	3.55106
38	63	0.65	38	9	0	63	1.38112	9.53	38	19	3	63	3.23251
39	60	0.925068	39	23.4398	0	60	2.85442	9.42	39	21	3	60	3.52187
40	63	0.883374	40	9	0	63	1.82293	9.69	40	23	1	63	4.54466

Population=50cxp=0.5 mutpb=0.1 ngen=40

gen	nevals	avg	gen	max	min	nevals	std	avg	gen	max	min	nevals	std
0	50	12.5211	0	36	4	50	6.50783	3.98	0	7	2	50	1.63083
1	24	8.91581	1	25	1.34219	24	4.02704	4.58	1	9	2	24	1.91927
2	38	6.8228	2	23.4398	1	38	4.13247	4.94	2	11	1	38	2.05339
3	32	6.03583	3	16	1	32	4.95192	5.2	3	11	3	32	1.72047
4	38	4.92251	4	25	0	38	5.64166	5.78	4	11	3	38	1.93173
5	31	3.30815	5	23.4398	0	31	4.16201	6.24	5	11	3	31	2.01554
6	27	3.24684	6	64	0	27	9.10791	6.76	6	11	3	27	1.98555
7	20	3.5234	7	54.0326	0	20	8.19438	6.68	7	13	3	20	1.73712
8	34	1.32375	8	9	0	34	2.04798	6.78	8	10	3	34	1.56576
9	25	1.53691	9	16	0	25	3.08094	7.58	9	11	3	25	1.83401
10	26	1.15382	10	9	0	26	2.00233	8.18	10	15	4	26	2.27763
11	25	1.11046	11	16	0	25	2.89131	7.84	11	17	4	25	2.07229
12	28	1.26072	12	16	0	28	2.64561	7.66	12	13	3	28	1.98605
13	28	0.760503	13	16	0	28	2.6271	7.48	13	12	5	28	1.51314
14	27	0.226844	14	4	0	27	0.651591	7.4	14	12	5	27	1.249
15	33	1.61892	15	25	0	33	3.82016	7.24	15	11	2	33	1.69186
16	24	1.0752	16	16	0	24	2.59583	7.28	16	11	5	24	1.28125
17	27	1.8	17	25	0	27	3.76298	7.14	17	11	2	27	1.69717
18	22	1.98531	18	29.1952	0	22	5.4989	7.42	18	13	4	22	1.63817
19	30	2.03368	19	16	0	30	3.76505	7.08	19	11	1	30	2.07692
20	30	inf	20	inf	0	30	nan	7.48	20	13	5	30	1.48647
21	22	1.06	21	16	0	22	2.6261	7.46	21	13	5	22	1.43122
22	31	1.78269	22	16	0	31	3.96426	7.8	22	15	3	31	2
23	20	1.81329	23	32.2958	0	20	4.69988	7.46	23	14	5	20	1.83532
24	31	1.44	24	4	0	31	1.85645	7.68	24	13	3	31	2.05368
25	32	2.04	25	16	0	32	3.21845	7.46	25	13	1	32	2.22
26	24	0.53939	26	11.9695	0	24	1.8959	7.52	26	11	4	24	1.20399
27	32	1.065	27	9	0	32	1.89394	7.62	27	15	5	32	1.7764
28	35	1.54	28	4	0	35	1.86773	7.56	28	13	3	35	2.08
29	23	1.43107	29	16	0	23	2.70118	7.68	29	12	5	23	1.56767
30	27	1.2214	30	16	0	27	3.01227	8.06	30	13	5	27	1.3625
31	34	inf	31	inf	0	34	nan	7.94	31	13	5	34	1.8375
32	31	2.36274	32	25	0	31	4.47773	7.42	32	11	4	31	1.66241
33	35	2.4214	33	16	0	35	3.78185	7.5	33	13	3	35	1.93132
34	33	1.94335	34	9	0	33	2.36868	7.44	34	13	3	33	2.0016
35	29	1.93591	35	25	0	29	4.1058	7.72	35	18	3	29	2.37521
36	28	2.3288	36	36	0	28	6.31072	7.26	36	11	5	28	1.30859
37	32	1.30201	37	9	0	32	2.0988	7.32	37	14	1	32	1.902
38	21	1.28	38	16	0	21	3.3409	7.54	38	11	5	21	1.56474
39	24	1.47691	39	9	0	24	2.13847	7.54	39	13	3	24	1.9719
40	36	1.89783	40	16	0	36	3.10604	7.16	40	13	1	36	1.94278

Population=100 cxp=0.3 mutpb=0.1 ngen=40

gen	nevals	avg	gen	max	min	nevals	std	avg	gen	max	min	nevals	std
0	100	14.0702	0	36	1	100	8.26098	3.72	0	7	2	100	1.42885
1	36	8.08543	1	49	1	36	5.77006	3.83	1	9	2	36	1.54955
2	46	4.73453	2	19.5024	1	46	3.47095	4.32	2	11	1	46	1.82143
3	48	2.6071	3	25	0	48	3.11629	5.6	3	12	1	48	1.85472
4	41	1.76171	4	16	0	41	2.34943	6.06	4	11	3	41	1.9433
5	41	0.878464	5	16	0	41	1.98929	6.5	5	12	1	41	1.8303
6	35	0.663889	6	9	0	35	1.54013	7.21	6	12	1	35	1.85631
7	31	0.908107	7	23.4398	0	31	3.15946	7.62	7	13	3	31	1.74803
8	31	0.311571	8	9	0	31	1.10914	7.44	8	11	3	31	1.16893
9	33	0.496727	9	25	0	33	2.52568	7.36	9	13	4	33	1.34551
10	49	0.633117	10	11.9695	0	49	1.72912	7.46	10	13	2	49	1.94124
11	29	0.492919	11	9	0	29	1.38848	7.91	11	14	3	29	2.13586
12	39	1.13074	12	25	0	39	3.86711	7.75	12	17	2	39	2.33399
13	33	0.337399	13	9.97631	0	33	1.16306	7.73	13	16	2	33	1.81579
14	35	0.377969	14	6.45314	0	35	1.08541	8.04	14	14	3	35	1.83804
15	45	0.814329	15	11.9695	0	45	2.04485	7.62	15	15	2	45	1.93277
16	43	1.17684	16	16	0	43	2.85847	7.83	16	15	3	43	2.37089
17	31	0.992559	17	36	0	31	4.1116	7.65	17	15	3	31	1.85135
18	40	1.1356	18	16	0	40	2.95324	7.33	18	15	1	40	1.95476
19	46	0.819948	19	25	0	46	3.0457	7.25	19	13	2	46	1.79095
20	27	0.528762	20	10.591	0	27	1.87468	7.35	20	11	1	27	1.51245
21	35	0.403989	21	9.97631	0	35	1.36123	7.59	21	13	3	35	1.78939
22	45	0.590566	22	9	0	45	1.58708	7.88	22	15	1	45	2.19217
23	41	0.527299	23	9	0	41	1.35542	7.94	23	14	1	41	2.06795
24	45	0.765745	24	25	0	45	2.75952	7.89	24	16	1	45	2.42031
25	47	inf	25	inf	0	47	nan	8.37	25	16	1	47	2.47651
26	39	0.44342	26	9	0	39	1.39615	8.58	26	15	1	39	2.31594
27	34	inf	27	inf	0	34	nan	9.04	27	15	3	34	2.36609
28	36	0.185846	28	2.20702	0	36	0.447247	8.73	28	15	5	36	1.70795
29	39	0.786947	29	25	0	39	3.03609	8.88	29	15	2	39	2.3464
30	40	0.542432	30	16	0	40	1.95193	8.91	30	21	5	40	2.37105
31	42	0.415598	31	4.61899	0	42	1.0693	8.8	31	15	3	42	2.08806
32	37	0.666275	32	9	0	37	1.64363	8.82	32	15	1	37	2.48749
33	41	0.527786	33	9	0	41	1.35021	8.79	33	15	1	41	2.19224
34	28	0.440006	34	9	0	28	1.3369	9.04	34	15	3	28	1.9996
35	29	0.74	35	25	0	29	2.89005	8.93	35	15	3	29	2.01621
36	23	inf	36	inf	0	23	nan	9.2	36	15	3	23	1.86548
37	43	0.602902	37	16	0	43	2.32395	9.3	37	15	3	43	1.92614
38	28	0.705735	38	25	0	28	2.87345	9.14	38	13	1	28	1.7494
39	42	0.681388	39	16	0	42	2.09587	9.14	39	17	1	42	2.49407
40	47	0.727139	40	9	0	47	1.70793	8.77	40	15	1	47	2.37847

Population=100 cxp=0.6 mutpb=0.1 ngen=40

gen	nevals	avg	gen	max	min	nevals	std	avg	gen	max	min	nevals	std
0	100	inf	0	inf	1	100	nan	3.72	0	7	2	100	1.65578
1	53	7.31841	1	25	1	53	4.67583	4.02	1	7	1	53	1.68511
2	67	4.29815	2	14.7569	1	67	2.33279	4.97	2	8	1	67	1.71146
3	56	3.87585	3	25	0	56	3.67069	5.73	3	9	3	56	1.42025
4	78	3.25456	4	25	0	78	3.65724	6.09	4	13	1	78	1.78939
5	53	2.28297	5	16	0	53	2.97956	6.73	5	14	3	53	2.21745
6	65	3.76481	6	144.332	0	65	15.1472	7.6	6	15	3	65	2.18174
7	64	1.15663	7	25	0	64	2.91389	8.03	7	15	3	64	2.22016
8	57	1.09686	8	49	0	57	5.03098	7.79	8	13	1	57	1.94574
9	61	1.0527	9	9	0	61	1.84482	7.59	9	16	1	61	2.47425
10	63	1.71306	10	25	0	63	4.31033	7.4	10	15	1	63	2.06882
11	70	1.99163	11	25	0	70	4.17922	7.43	11	17	3	70	2.42592
12	65	1.18836	12	16	0	65	2.58145	7.55	12	15	3	65	1.95128
13	77	1.67629	13	9	0	77	2.55178	7.28	13	14	3	77	2.25867
14	69	1.92697	14	16	0	69	3.78709	7.1	14	14	1	69	2.32164
15	58	1.35023	15	16	0	58	2.55862	7.48	15	19	3	58	2.58256
16	61	1.22232	16	9	0	61	2.2169	7.3	16	14	3	61	2.10476
17	66	1.60838	17	25	0	66	3.95685	7.29	17	12	3	66	1.88836
18	63	inf	18	inf	0	63	nan	7.39	18	14	3	63	1.71403
19	61	1.04232	19	25	0	61	3.61418	7.22	19	11	3	61	1.41831
20	70	1.43953	20	16	0	70	3.20598	7.3	20	13	1	70	1.96723
21	71	1.02162	21	9	0	71	2.01705	7.44	21	13	1	71	1.96632
22	65	2.25978	22	25	0	65	5.31379	7.71	22	13	3	65	2.02136
23	67	1.17166	23	16	0	67	2.96153	7.39	23	13	3	67	1.92819
24	79	1.9696	24	25	0	79	4.02997	7.37	24	15	1	79	2.50462
25	69	1.59085	25	16	0	69	2.76923	7.7	25	16	1	69	2.66271
26	66	1.27466	26	11.9695	0	66	2.24223	7.52	26	16	2	66	2.39366
27	59	2.11542	27	25	0	59	4.55203	7.56	27	13	2	59	2.28613
28	74	1.20616	28	17.2934	0	74	2.62419	7.62	28	13	1	74	2.29687
29	68	inf	29	inf	0	68	nan	7.65	29	16	1	68	2.3254
30	69	0.802751	30	9	0	69	1.94582	7.7	30	13	3	69	1.88944
31	66	1.22075	31	16	0	66	2.61013	7.38	31	14	1	66	2.26619
32	67	2.27392	32	25	0	67	5.4979	7.97	32	15	1	67	2.45949
33	57	0.483549	33	9.87497	0	57	1.36028	8.31	33	15	3	57	2.39873
34	60	0.612771	34	9	0	60	1.35266	8.35	34	18	3	60	2.80847
35	60	1.0756	35	25	0	60	4.1206	8.63	35	17	3	60	2.28322
36	66	1.76453	36	25	0	66	4.25954	8.74	36	18	1	66	2.90041
37	72	1.23115	37	25	0	72	3.27333	8.79	37	21	1	72	3.2536
38	77	1.01435	38	12.1494	0	77	2.17661	8.86	38	19	1	77	3.72564
39	59	0.77949	39	9	0	59	1.50567	9.41	39	24	3	59	3.40616
40	79	1.13212	40	25	0	79	2.87933	9.42	40	19	3	79	3.69914

Population=100 cxp=0.8 mutpb=0.1 ngen=40

gen	nevals	avg	gen	max	min	nevals	std	avg	gen	max	min	nevals	std
0	100	13.3176	0	49	1	100	7.78067	3.56	0	7	2	100	1.40228
1	84	inf	1	inf	0.022256	84	nan	3.81	1	9	1	84	1.60434
2	78	6.15606	2	36	0.022256	78	4.66074	4.29	2	11	1	78	1.81271
3	83	4.41436	3	36	0	83	5.1348	4.97	3	11	1	83	1.95681
4	82	2.67823	4	32.2958	0	82	4.48938	5.9	4	12	2	82	1.96723
5	81	1.68807	5	14.7569	0	81	2.48014	6.7	5	13	3	81	2.21133
6	82	1.52853	6	25	0	82	3.3303	7.52	6	14	2	82	2.50392
7	81	1.36507	7	16	0	81	2.66537	8.07	7	17	3	81	2.71755
8	83	1.00638	8	9	0	83	1.57663	7.84	8	15	1	83	2.65977
9	85	inf	9	inf	0	85	nan	8.13	9	17	3	85	2.75193
10	84	1.84008	10	25	0	84	4.4513	7.79	10	17	2	84	2.82239
11	75	1.82106	11	16	0	75	3.28198	7.82	11	19	1	75	3.18239
12	82	0.744596	12	6.45314	0	82	1.36455	7.54	12	15	3	82	2.27781
13	76	0.977647	13	16	0	76	2.26318	7.83	13	15	3	76	2.19114
14	74	0.579164	14	9	0	74	1.27167	8.07	14	13	3	74	1.8507
15	88	1.14537	15	11.9695	0	88	1.87412	8.2	15	15	3	88	2.77128
16	77	0.751802	16	9	0	77	1.54492	8.19	16	18	3	77	2.65215
17	81	1.20726	17	9	0	81	1.7182	8.34	17	17	3	81	3.1216
18	90	1.02797	18	14.7569	0	90	1.93754	8.3	18	15	3	90	2.82312
19	84	0.855535	19	9	0	84	1.5895	8.36	19	17	3	84	2.83732
20	83	1.2628	20	25	0	83	3.82417	8.3	20	21	1	83	2.91033
21	88	0.739009	21	9	0	88	1.41403	8.33	21	15	3	88	2.55364
22	82	1.02669	22	4	0	82	1.53873	8.23	22	17	3	82	2.92183
23	77	0.873494	23	9	0	77	1.63052	8.29	23	17	3	77	2.62029
24	74	0.714215	24	16	0	74	1.85878	8.26	24	22	3	74	2.61389
25	78	1.05105	25	9	0	78	1.87663	8.3	25	19	1	78	3.11929
26	76	0.84806	26	36	0	76	3.7476	8.24	26	15	1	76	2.55781
27	85	0.815558	27	9	0	85	1.73982	8.13	27	15	1	85	2.68572
28	91	1.38743	28	9.87497	0	91	2.09841	8.3	28	20	3	91	3.54542
29	86	1.05392	29	9	0	86	1.66532	9.15	29	24	3	86	4.08258
30	82	0.774578	30	6.05011	0	82	1.43898	9.13	30	24	3	82	3.37833
31	81	1.01099	31	9	0	81	1.68827	9.04	31	18	3	81	3.08195
32	86	1.72501	32	16	0	86	2.81416	8.69	32	19	2	86	3.49198
33	82	1.35754	33	25	0	82	3.17103	9.07	33	19	2	82	3.39781
34	82	inf	34	inf	0	82	nan	9.99	34	21	3	82	3.72423
35	88	0.955502	35	9	0	88	1.62462	10.84	35	21	3	88	4.11757
36	87	1.07376	36	19.8889	0	87	2.36861	11.23	36	28	3	87	4.61704
37	83	1.1208	37	16	0	83	2.57724	11.16	37	27	3	83	4.61675
38	74	0.937145	38	12.1494	0	74	1.96417	10.32	38	22	3	74	4.22819
39	73	1.42065	39	23.4398	0	73	3.49444	9.67	39	19	2	73	4.28965
40	76	1.34055	40	20.6143	0	76	2.61344	9.88	40	21	3	76	4.4391

Population=100 cxp=0.5 mutpb=0.3 ngen=40

gen	nevals	avg	gen	max	min	nevals	std	avg	gen	max	min	nevals	std
0	100	inf	0	inf	1.34219	100	nan	3.94	0	7	2	100	1.62985
1	66	inf	1	inf	1	66	nan	4.29	1	13	1	66	2.3719
2	73	inf	2	inf	1	73	nan	4.65	2	13	1	73	2.5976
3	62	inf	3	inf	1	62	nan	4.73	3	12	1	62	2.27971
4	71	3.34198	4	20.6143	0	71	3.41268	5.29	4	11	1	71	2.22843
5	69	2.94413	5	25	0	69	4.29329	5.59	5	12	1	69	2.11232
6	73	2.32793	6	25	0	73	4.08866	6.38	6	11	1	73	1.9989
7	74	inf	7	inf	0	74	nan	7.01	7	15	1	74	2.52783
8	69	1.61386	8	29.8083	0	69	3.65488	7.44	8	15	1	69	2.32946
9	73	1.58006	9	19.5024	0	73	3.27509	7.29	9	15	1	73	2.61647
10	70	1.05454	10	9	0	70	1.92898	7.59	10	14	3	70	2.42938
11	65	1.50543	11	23.4398	0	65	3.35819	7.97	11	17	1	65	2.77292
12	62	inf	12	inf	0	62	nan	8.1	12	14	1	62	2.87576
13	64	1.256	13	9	0	64	2.14996	8.26	13	27	1	64	3.74865
14	66	1.28367	14	25	0	66	2.98378	8.97	14	18	1	66	3.07068
15	66	inf	15	inf	0	66	nan	8.75	15	18	1	66	3.25998
16	60	0.879755	16	11.9695	0	60	1.9807	8.62	16	16	1	60	2.9556
17	71	1.29818	17	16	0	71	2.83929	8.54	17	15	1	71	2.57457
18	70	1.42882	18	11.9695	0	70	2.53156	8.96	18	16	1	70	2.94931
19	61	2.1354	19	36	0	61	5.45778	8.93	19	17	1	61	3.28407
20	69	2.17015	20	25	0	69	4.34228	9.44	20	18	1	69	3.28122
21	56	1.25294	21	23.4398	0	56	3.41822	9.63	21	20	1	56	3.52606
22	60	1.42486	22	25	0	60	3.89882	9.72	22	18	1	60	3.4988
23	68	0.593033	23	9	0	68	1.28444	10.16	23	23	3	68	3.53757
24	68	1.48199	24	20.6143	0	68	3.22176	9.59	24	21	3	68	3.14673
25	71	1.56206	25	25	0	71	3.65064	9.28	25	19	2	71	3.33191
26	72	1.10189	26	10.8977	0	72	2.08166	8.95	26	19	5	72	3.13488
27	75	1.73557	27	36	0	75	4.45464	8.99	27	19	1	75	3.35707
28	57	1.02144	28	16.5472	0	57	2.5902	8.84	28	21	1	57	3.27329
29	69	0.829181	29	9.24344	0	69	1.68827	8.96	29	16	3	69	2.74197
30	72	inf	30	inf	0	72	nan	8.32	30	15	1	72	3.02285
31	61	1.53053	31	9.97631	0	61	2.90907	8.6	31	19	1	61	3.38231
32	64	inf	32	inf	0	64	nan	8.74	32	19	2	64	3.00872
33	66	1.20742	33	9.97631	0	66	2.44103	9.31	33	19	1	66	2.99565
34	64	1.50558	34	25	0	64	3.77845	9.15	34	17	1	64	3.20117
35	57	0.895971	35	25	0	57	2.85822	8.93	35	18	1	57	2.88532
36	67	1.09588	36	12.5337	0	67	2.39501	9.4	36	21	1	67	3.28024
37	65	inf	37	inf	0	65	nan	9.13	37	25	1	65	3.53456
38	65	inf	38	inf	0	65	nan	9.65	38	20	3	65	3.0639
39	66	1.66951	39	23.4398	0	66	3.83644	8.62	39	18	1	66	3.06196
40	71	0.959879	40	9	0	71	2.06309	9.19	40	17	1	71	2.81672

Population=100 cxp=0.5 mutpb=0.5 ngen=40

	fitness						size					
gen	nevals	avg	gen	max	min	nevals	std	avg	gen	max	min	nevals	std
0	100	13.3124	0	36	4	100	7.62667	3.58	0	7	2	100	1.51116
1	68	8.53956	1	25	1.73464	68	4.92452	4.7	1	11	1	68	2.24722
2	80	nan	2	nan	nan	80	nan	5.42	2	15	1	80	2.6615
3	74	6.81197	3	49	0.0890238	74	6.74004	5.58	3	16	1	74	2.9366
4	72	inf	4	inf	0.0890238	72	nan	6.24	4	18	1	72	3.94745
5	73	inf	5	inf	0.0890238	73	nan	8.86	5	25	1	73	4.93563
6	75	inf	6	inf	0	75	nan	10.08	6	21	1	75	4.87787
7	75	inf	7	inf	0	75	nan	10.77	7	22	2	75	4.72621
8	71	inf	8	inf	0	71	nan	11.68	8	23	1	71	4.69655
9	73	2.65363	9	32.5086	0	73	4.35717	12.08	9	28	1	73	5.56899
10	75	inf	10	inf	0	75	nan	11.96	10	26	2	75	4.83926
11	80	inf	11	inf	0	80	nan	11.07	11	30	1	80	4.88724
12	70	1.31687	12	19.1563	0	70	2.99683	12.59	12	34	2	70	5.07562
13	74	inf	13	inf	0	74	nan	12.15	13	28	1	74	4.82157
14	69	1.71198	14	23.4398	0	69	3.4501	12.34	14	33	1	69	4.88512
15	79	inf	15	inf	0	79	nan	12.6	15	25	1	79	4.75184
16	72	inf	16	inf	0	72	nan	12.29	16	23	1	72	4.73137
17	87	inf	17	inf	0	87	nan	12.7	17	31	1	87	5.50182
18	68	1.53508	18	9	0	68	2.71417	12.6	18	29	1	68	4.78121
19	76	1.62243	19	25	0	76	3.52381	11.94	19	23	1	76	4.38821
20	76	2.70957	20	53.4068	0	76	6.32	12.28	20	25	2	76	4.99616
21	76	1.69641	21	25	0	76	3.81547	13.72	21	33	1	76	5.2803
22	80	1.3365	22	16	0	80	2.83477	14.23	22	30	1	80	5.52242
23	73	nan	23	nan	nan	73	nan	14.38	23	30	1	73	4.86987
24	80	nan	24	nan	nan	80	nan	14.35	24	29	1	80	5.47974
25	70	nan	25	nan	nan	70	nan	13.53	25	27	1	70	5.26204
26	77	nan	26	nan	nan	77	nan	14.23	26	28	1	77	5.73211
27	75	nan	27	nan	nan	75	nan	14.22	27	30	1	75	6.4243
28	74	nan	28	nan	nan	74	nan	14.72	28	33	1	74	6.21785
29	71	nan	29	nan	nan	71	nan	14.84	29	31	3	71	5.84418
30	75	nan	30	nan	nan	75	nan	14.2	30	36	1	75	6.46838
31	73	nan	31	nan	nan	73	nan	14.59	31	35	2	73	6.43598
32	74	nan	32	nan	nan	74	nan	13.76	32	35	1	74	6.22434
33	75	nan	33	nan	nan	75	nan	15.07	33	35	1	75	6.2582
34	79	nan	34	nan	nan	79	nan	14.39	34	40	3	79	6.37792
35	81	nan	35	nan	nan	81	nan	13.25	35	29	1	81	6.44263
36	74	nan	36	nan	nan	74	nan	13.84	36	27	1	74	5.96275
37	75	inf	37	inf	0	75	nan	14.79	37	27	1	75	5.65207
38	82	inf	38	inf	0	82	nan	16.26	38	39	1	82	7.29879
39	74	inf	39	inf	0	74	nan	17.61	39	41	3	74	7.79602
40	77	inf	40	inf	0	77	nan	18.6	40	36	5	77	7.67463

Population=100 cxp=0.5 mutpb=0.4 ngen=40

	fitness						size					
gen	nevals	avg	gen	max	min	nevals	std	avg	gen	max	min	nevals	std
0	100	nan	0	nan	nan	100	nan	3.79	0	7	2	100	1.73375
1	69	9.05707	1	25	0.0890238	69	4.59891	4.25	1	11	1	69	2.0168
2	72	7.64155	2	36	0	72	5.35493	4.84	2	13	1	72	2.23929
3	71	inf	3	inf	0	71	nan	5.87	3	13	1	71	2.64066
4	69	4.82518	4	37.1317	0	69	6.48408	6.74	4	17	1	69	2.74088
5	75	inf	5	inf	0	75	nan	7.19	5	16	1	75	3.18024
6	64	inf	6	inf	0	64	nan	7.58	6	17	1	64	3.35016
7	76	2.5115	7	34.1228	0	76	4.47511	8.16	7	18	1	76	3.22403
8	71	1.88373	8	42.8787	0	71	5.56642	9.62	8	20	1	71	3.33101
9	69	3.26821	9	40.6635	0	69	7.19275	9.61	9	17	1	69	3.43772
10	86	4.52724	10	91.2492	0	86	12.0145	10.45	10	19	1	86	3.69966
11	70	2.52914	11	16	0	70	4.05504	10.73	11	22	1	70	3.56891
12	69	3.33422	12	100	0	69	10.5518	10.3	12	20	3	69	3.9
13	76	nan	13	nan	nan	76	nan	10.68	13	25	1	76	4.60191
14	72	nan	14	nan	nan	72	nan	10.84	14	21	1	72	4.23962
15	69	nan	15	nan	nan	69	nan	11.08	15	21	1	69	3.6323
16	68	inf	16	inf	0	68	nan	11.46	16	21	2	68	3.33892
17	65	1.91669	17	16	0	65	3.66683	10.9	17	23	1	65	4.05093
18	65	2.58596	18	43.1017	0	65	7.10418	10.91	18	21	3	65	3.35588
19	73	inf	19	inf	0	73	nan	11.14	19	21	1	73	3.84973
20	68	inf	20	inf	0	68	nan	11.19	20	21	1	68	3.99674
21	75	2.35936	21	36	0	75	5.53341	11.04	21	24	2	75	4.04949
22	68	3.71765	22	36	0	68	6.47658	10.52	22	25	1	68	4.42601
23	71	inf	23	inf	0	71	nan	11.1	23	27	1	71	5.82323
24	71	inf	24	inf	0	71	nan	11.26	24	27	1	71	4.71512
25	61	2.5666	25	25	0	61	5.33029	11.49	25	27	2	61	4.57929
26	67	2.07607	26	25.8125	0	67	4.4699	10.44	26	27	1	67	4.38707
27	66	inf	27	inf	0	66	nan	10.66	27	19	3	66	3.1913
28	75	inf	28	inf	0	75	nan	10.92	28	25	2	75	4.60365
29	68	2.05686	29	25	0	68	4.81454	10.75	29	19	4	68	3.10282
30	67	2.11374	30	36	0	67	5.06164	10.92	30	22	3	67	3.4574
31	73	inf	31	inf	0	73	nan	10.83	31	23	1	73	4.0769
32	70	2.58573	32	36	0	70	5.41443	11.4	32	23	3	70	4.10366
33	70	2.68063	33	70.2092	0	70	7.80918	11.25	33	23	1	70	4.3735
34	73	inf	34	inf	0	73	nan	12.85	34	31	1	73	4.86287
35	74	inf	35	inf	0	74	nan	13.2	35	25	1	74	4.54313
36	68	inf	36	inf	0	68	nan	14.19	36	25	2	68	4.78685
37	64	2.72724	37	64	0	64	8.58281	13.9	37	29	3	64	5.01896
38	66	inf	38	inf	0	66	nan	13.26	38	25	1	66	5.25094
39	71	inf	39	inf	0	71	nan	12.81	39	27	3	71	4.67268
40	69	inf	40	inf	0	69	nan	11.58	40	27	1	69	5.0243

Population=100 cxp=0.5 mutpb=0.1 ngen=30

gen	nevals	avg	gen	max	min	nevals	std	avg	gen	max	min	nevals	std
0	100	inf	0	inf	1	100	nan	3.65	0	7	2	100	1.51905
1	59	9.0944	1	25	0	59	4.70854	3.75	1	8	1	59	1.57718
2	64	6.21721	2	19.8889	0	64	3.19167	4.18	2	10	1	64	1.85138
3	65	4.28603	3	29.8083	0	65	3.74973	4.88	3	10	1	65	2.03116
4	44	1.93484	4	9	0	44	1.77334	6.06	4	10	3	44	1.88053
5	58	0.983561	5	9	0	58	1.46396	6.72	5	14	1	58	1.88191
6	59	1.05028	6	25	0	59	2.88646	7.17	6	12	1	59	1.70912
7	50	0.352872	7	9	0	50	1.02328	7.22	7	12	1	50	1.43234
8	49	0.567647	8	9	0	49	1.3212	7.25	8	14	1	49	1.92029
9	59	0.828639	9	16	0	59	2.34822	7.39	9	15	3	59	1.85954
10	50	1.04889	10	16	0	50	2.75677	7.13	10	12	1	50	1.80917
11	46	0.625047	11	25	0	46	2.80105	7.13	11	12	1	46	1.62268
12	52	0.455379	12	11.9695	0	52	1.50878	7.25	12	12	2	52	1.49248
13	55	0.382377	13	9.97631	0	55	1.19814	7.2	13	12	2	55	1.38564
14	50	0.524979	14	11.9695	0	50	1.7659	7.25	14	13	1	50	1.73997
15	50	0.462877	15	16	0	50	1.76917	7.26	15	14	3	50	1.59135
16	67	0.414478	16	9	0	67	1.2958	7.23	16	13	1	67	1.59909
17	67	0.53634	17	9	0	67	1.20153	7.32	17	14	1	67	1.79377
18	62	0.802314	18	20.6143	0	62	2.64209	7.28	18	13	3	62	1.74402
19	62	1.06729	19	25	0	62	3.08115	7.53	19	15	2	62	2.10454
20	62	0.489511	20	11.9695	0	62	1.39379	7.82	20	15	2	62	2.10893
21	57	0.866122	21	16	0	57	2.23096	7.8	21	15	1	57	2.27596
22	61	0.799804	22	25	0	61	3.003	7.98	22	20	2	61	2.43302
23	53	0.269658	23	4	0	53	0.566943	8.03	23	13	3	53	1.84637
24	55	0.329444	24	4	0	55	0.684184	7.75	24	14	3	55	1.86748
25	52	0.52049	25	9	0	52	1.47148	7.97	25	20	3	52	2.61325
26	52	0.884848	26	16	0	52	2.71633	7.81	26	13	1	52	2.22574
27	61	0.715541	27	25	0	61	2.59998	8.35	27	15	3	61	2.31679
28	66	inf	28	inf	0	66	nan	8.49	28	18	3	66	2.80533
29	62	0.652897	29	23.4398	0	62	2.60219	8.16	29	19	3	62	2.67851
30	48	0.698388	30	25	0	48	2.73645	8.07	30	15	3	48	2.15525

Population=100 cxp=0.5 mutpb=0.1 ngen=30

gen	nevals	avg	gen	max	min	nevals	std	avg	gen	max	min	nevals	std
0	100	13.3124	0	36	1	100	7.19077	3.56	0	7	2	100	1.58947
1	56	9.13285	1	25	4	56	3.81444	3.71	1	9	1	56	1.6929
2	50	7.07247	2	25	4	50	3.11528	3.97	2	8	1	50	1.52614
3	53	5.2137	3	16	1	53	2.45573	3.64	3	8	1	53	1.22082
4	57	4.80909	4	25	0	57	3.12255	3.7	4	10	1	57	1.69411
5	67	4.01071	5	16	0	67	2.29435	4.04	5	11	2	67	1.83804
6	52	3.42825	6	16	0	52	2.6498	4.77	6	11	1	52	2.29284
7	58	2.08324	7	16	0	58	2.63935	6.25	7	13	1	58	2.71431
8	53	1.20993	8	16	0	53	2.28839	7.09	8	15	3	53	2.19132
9	57	0.9127	9	16	0	57	2.05544	7.38	9	13	3	57	1.85892
10	58	0.932837	10	9	0	58	1.77773	7.28	10	16	1	58	2.11225
11	57	1.501	11	19.8889	0	57	3.37685	7.43	11	14	3	57	2.21926
12	61	1.31243	12	25	0	61	3.25011	7.39	12	12	2	61	2.05862
13	59	inf	13	inf	0	59	nan	7.58	13	12	3	59	2.07451
14	53	0.96439	14	9	0	53	2.11354	7.52	14	15	1	53	2.18852
15	46	0.860761	15	11.9695	0	46	1.95773	7.32	15	14	1	46	2.14886
16	44	inf	16	inf	0	44	nan	7.41	16	13	2	44	1.80607
17	57	0.82	17	25	0	57	2.90303	7.49	17	13	1	57	1.84117
18	55	0.864411	18	9	0	55	1.73891	7.7	18	15	1	55	2.39792
19	41	0.512199	19	11.9695	0	41	1.50934	7.7	19	16	3	41	2.1
20	57	0.828889	20	19.8889	0	57	2.28443	7.65	20	14	3	57	1.90984