

Ans-1.Change of Population Size

Population Size	Bestfun	Bestrun	BestVariables
10	11.4815	1	1.6606, 2.0201, 2.5132
20	0.0090	1	0.9721, 2.0018, 2.9940
30	0.0055	1	1.0183, 2.0062, 3.0067
40	0.0039	1	1.0047, 2.0121, 2.9950
50	5.5906e-04	1	1.0038, 2.0013, 3.0036

Best Population size=50**Ans-2.Change of Inertia Weight**

Inertia Weight(W)	Bestfun	Bestrun	BestVariables
0.1	2.9896e-05	1	1.0000, 2.0008, 3.0008
0.2	1.4205e-04	1	0.9983, 1.9976, 3.0000
0.3	0.0015	1	1.0116, 2.0024, 2.9998
0.4	0.0102	1	1.0042, 2.0220, 3.0035
0.5	0.0411	1	1.0042, 2.0338, 2.9754
0.6	0.0348	1	1.0298, 2.0345, 3.0084
0.7	0.1508	1	0.9146, 2.0620, 3.0058
0.8	0.3761	1	0.9437, 2.0637, 2.9063
0.9	0.2568	1	0.9389, 2.1001, 2.9748

Best Inertia Weight=0.1**Ans-3.Change the no of iteration**

No of Iteration	BestFun	Bestrun	BestVariables
10	2.9896e-05	1	1.0000, 2.0008, 3.0008

20	7.3022e-11	1	1.0000, 2.0000, 3.0000
30	1.7921e-16	1	1.0000, 2.0000, 3.0000
40	2.8752e-23	1	1.0000, 2.0000, 3.0000
50	6.3602e-29	1	1.0000, 2.0000, 3.0000
60	0	1	1,2,3
70	0	1	1,2,3
80	0	1	1,2,3
90	0	1	1,2,3
100	0	1	1,2,3

Best Iteration=50

Ans-4(a)Change the acceleration factor C1(for Pbest)

C1	BestFun	BestRun	BestVariables
0	6.0904e-06	1	1.0004, 2.0005, 2.9999
0.2	4.7387e-05	1	1.0010, 2.0006, 2.9990
0.4	4.1411e-05	1	0.9985, 1.9991, 3.0003
0.6	6.2247e-06	1	1.0007, 1.9997, 3.0000
0.8	8.0893e-06	1	0.9996, 1.9998, 3.0004
1.0	2.9896e-05	1	1.0000, 2.0008, 3.0008

Best Acceleration factor,C1=0.6

Ans-4(b)Change the acceleration factor C2(for Gbest)

C2	BestFun	BestRun	BestVariables
0	19.9587	1	0.9997, 2.9990 ,2.9985
0.2	3.3534	1	1.2613, 2.3601, 2.9491
0.4	1.2536	1	1.2522, 2.1700, 2.9636

0.6	0.8439	1	1.1949, 2.1509, 2.9831
0.8	0.1792	1	1.0220, 2.0905, 3.0187
1.0	0.0057	1	1.0068, 2.0040, 3.0128

Best Acceleration Factor(C2) = 1

Ans-5

If $C1 > C2$ then we will do more local search than global search. Hence, We will try to find the best local function in the algorithm.

If $C2 > C1$ then we will do more global search than local search. So, We will reach our global optimum.

Ans-6 Effect of Run

Run	BestFun	BestRun	BestVariables
1	2.9949e-05	1	0.9990 ,1.9990, 3.0000
3	9.0819e-06	1	0.9995, 2.0002, 2.9996
5	6.3498e-06	4	0.9994, 1.9999, 2.9997
10	0	2	1,2,3
50	0	8	1,2,3

Yes, Run Has effect. The best one is 10. Program runs for multiple times thus giving the program more opportunity to come up with a better solution and thus it gives a more accurate solution.