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 1 /Users/meijiaojiao/opt/anaconda3/envs/RunToEnd/bin/python /Users/meijiaojiao/Desktop/Evolution_algorithm/stuck in local minima/L/Lamarck_main.py
 2 [['iterations', 'mutation_rate', 'num_individuals', 'crossover_probability', 'Mutation_type', 'Crossover_type', 'local_search_rate', 'Local_search_type', 'R']]
 3 [[1000000, 1.0, 200, 0.6, 'Normal', 'Probabilistic_crossover', 0.5, 'Uniform', 0.1]] [579]
 4 2022-11-20 20:19:51
 5 Now testing Function21
 6 Times is 0
 7 Iter at 1998,  best solution is -2.62814E+00,  optima is -10.1532,  similarity is 8.74989E+00,  phenotype is [2.9905020320074613, 6.999064747892255, 3.0116907482161874, 6.9861731290971845]
 8 Iter at 3998,  best solution is -2.62893E+00,  optima is -10.1532,  similarity is 4.82299E-01,  phenotype is [3.0013941319095285, 6.999064747892255, 3.0116907482161874, 6.9861731290971845]
 9 Iter at 5998,  best solution is -2.62979E+00,  optima is -10.1532,  similarity is 2.58691E-01,  phenotype is [3.0013941319095285, 6.999064747892255, 3.0116907482161874, 6.9861731290971845]
10 Iter at 7998,  best solution is -2.63038E+00,  optima is -10.1532,  similarity is 9.09956E-01,  phenotype is [3.001611524153871, 6.999047248000289, 3.003580364286843, 6.9951022091372055]
11 Iter at 9998,  best solution is -2.63045E+00,  optima is -10.1532,  similarity is 2.17880E-01,  phenotype is [3.001611524153871, 6.999047248000289, 3.000162951129107, 6.997837698624506]
12 Iter at 11998,  best solution is -2.63045E+00,  optima is -10.1532,  similarity is 1.21959E+00,  phenotype is [3.001611524153871, 6.998166589138557, 3.000162951129107, 6.997837698624506]
13 Iter at 13998,  best solution is -2.63045E+00,  optima is -10.1532,  similarity is 1.89006E+00,  phenotype is [3.001611524153871, 6.998166589138557, 3.000162951129107, 6.997837698624506]
14 Iter at 15998,  best solution is -2.63045E+00,  optima is -10.1532,  similarity is 7.14291E-02,  phenotype is [3.001611524153871, 6.998166589138557, 3.000162951129107, 6.9983310739087001]
15 Iter at 17998,  best solution is -2.63045E+00,  optima is -10.1532,  similarity is 0.00000E+00,  phenotype is [3.001611524153871, 6.998166589138557, 3.000162951129107, 6.9983310739087001]
16 Iter at 19998,  best solution is -2.63045E+00,  optima is -10.1532,  similarity is 3.66047E-02,  phenotype is [3.001611524153871, 6.998166589138557, 3.000162951129107, 6.9983310739087001]
17 Iter at 21998,  best solution is -2.63045E+00,  optima is -10.1532,  similarity is 4.09340E-01,  phenotype is [3.001611524153871, 6.998166589138557, 3.000162951129107, 6.9983310739087001]
18 Iter at 23998,  best solution is -2.63045E+00,  optima is -10.1532,  similarity is 2.73112E-01,  phenotype is [3.001611524153871, 6.998166589138557, 3.000162951129107, 6.9983310739087001]
19 Iter at 25998,  best solution is -2.63045E+00,  optima is -10.1532,  similarity is 1.88364E-01,  phenotype is [3.001611524153871, 6.998166589138557, 3.000162951129107, 6.9983310739087001]
20 Iter at 27998,  best solution is -2.63046E+00,  optima is -10.1532,  similarity is 1.99814E-01,  phenotype is [3.001611524153871, 6.998166589138557, 3.0029001345242965, 6.9983310739087001]
21 Iter at 29998,  best solution is -2.63046E+00,  optima is -10.1532,  similarity is 9.96174E-01,  phenotype is [3.001611524153871, 6.998212650129371, 3.0029001345242965, 6.9983310739087001]
22 Iter at 31998,  best solution is -2.63046E+00,  optima is -10.1532,  similarity is 8.69089E-01,  phenotype is [3.001611524153871, 6.998212650129371, 3.0029001345242965, 6.9983310739087001]
23 Iter at 33998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 3.84189E-01,  phenotype is [3.001611524153871, 6.998212650129371, 3.0012359222836102, 6.9983310739087001]
24 Iter at 35998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 1.40892E-02,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
25 Iter at 37998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 0.00000E+00,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
26 Iter at 39998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 6.97816E-01,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
27 Iter at 41998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 9.94709E-01,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
28 Iter at 43998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 1.62347E-01,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
29 Iter at 45998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 1.47900E+00,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
30 Iter at 47998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 8.08691E-01,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
31 Iter at 49998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 3.18719E-01,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
32 Iter at 51998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 2.03899E+00,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
33 Iter at 53998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 1.02037E+00,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
34 Iter at 55998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 1.53398E+00,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
35 Iter at 57998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 0.00000E+00,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
36 Iter at 59998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 8.49730E-01,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
37 Iter at 61998,  best solution is -2.63047E+00,  optima is -10.1532,  similarity is 1.08497E+00,  phenotype is [3.001611524153871, 6.998393281055816, 3.0012359222836102, 6.9983310739087001]
38 Iter at 63998,  best solution is -1.00734E+01,  optima is -10.1532,  similarity is 3.27281E+01,  phenotype is [3.9770028481792523, 4.0118457468851405, 3.9936962456696277, 4.009970183066282]
39 Iter at 65998,  best solution is -1.01340E+01,  optima is -10.1532,  similarity is 8.73333E-01,  phenotype is [4.011867612075181, 3.9996393863839987, 3.9936962456696277, 3.996682174342233]
40 Iter at 67998,  best solution is -1.01510E+01,  optima is -10.1532,  similarity is 9.18673E-01,  phenotype is [4.0028773116877225, 3.9996393863839987, 4.002607000543551, 3.9975474703344127]
41 Iter at 69998,  best solution is -1.01510E+01,  optima is -10.1532,  similarity is 1.35353E+00,  phenotype is [4.0028773116877225, 3.9996393863839987, 4.002607000543551, 3.9975474703344127]
42 Iter at 71998,  best solution is -1.01515E+01,  optima is -10.1532,  similarity is 1.94925E+00,  phenotype is [4.0028773116877225, 4.000467958169962, 3.998724392630907, 3.9975474703344127]
43 Iter at 73998,  best solution is -1.01522E+01,  optima is -10.1532,  similarity is 1.88077E+00,  phenotype is [3.9987100750665148, 4.000467958169962, 3.9988677871271223, 3.9975474703344127]
44 Iter at 75998,  best solution is -1.01523E+01,  optima is -10.1532,  similarity is 0.00000E+00,  phenotype is [3.9987100750665148, 4.000467958169962, 3.999169521520043, 3.9975474703344127]
45 Iter at 77998,  best solution is -1.01528E+01,  optima is -10.1532,  similarity is 2.08117E-01,  phenotype is [3.9987100750665148, 4.000467958169962, 3.999169521520043, 3.999023477675245]
46 Iter at 79998,  best solution is -1.01529E+01,  optima is -10.1532,  similarity is 1.66258E+00,  phenotype is [3.9987100750665148, 4.000467958169962, 3.999169521520043, 3.9999004879702054]
47 Iter at 81998,  best solution is -1.01529E+01,  optima is -10.1532,  similarity is 8.04527E-01,  phenotype is [3.9987100750665148, 4.000467958169962, 3.999169521520043, 3.9999004879702054]
48 Iter at 83998,  best solution is -1.01530E+01,  optima is -10.1532,  similarity is 1.69529E+00,  phenotype is [3.9987909955732306, 4.000467958169962, 3.999169521520043, 3.9999004879702054]
49 Iter at 85998,  best solution is -1.01530E+01,  optima is -10.1532,  similarity is 5.34510E-01,  phenotype is [3.9987909955732306, 4.000467958169962, 3.999169521520043, 3.9999004879702054]
50 Iter at 87998,  best solution is -1.01530E+01,  optima is -10.1532,  similarity is 0.00000E+00,  phenotype is [3.9987909955732306, 4.000467958169962, 3.999169521520043, 3.9999004879702054]
51 Iter at 89998,  best solution is -1.01530E+01,  optima is -10.1532,  similarity is 5.12367E-01,  phenotype is [3.9987909955732306, 4.000467958169962, 3.999169521520043, 3.9999004879702054]
52 Iter at 91998,  best solution is -1.01531E+01,  optima is -10.1532,  similarity is 0.00000E+00,  phenotype is [4.000317716617589, 4.000467958169962, 3.999169521520043, 3.9999004879702054]
53 Iter at 93998,  best solution is -1.01531E+01,  optima is -10.1532,  similarity is 6.63421E-01,  phenotype is [4.000317716617589, 4.000467958169962, 3.999169521520043, 3.9999004879702054]
54 Iter at 95998,  best solution is -1.01531E+01,  optima is -10.1532,  similarity is 5.65965E-01,  phenotype is [4.000317716617589, 4.000467958169962, 3.999169521520043, 3.9999004879702054]
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55 Iter at 97998,  best solution is -1.01531E+01,  optima is -10.1532,  similarity is 0.00000E+00,  phenotype is [4.000317716617589, 4.000467958169962, 3.999169521520043, 3.9999004879702054]
56 current optimal is -10.1532,global minima is -10.1532,similarity is 0.24722084161266045
57
58 Process finished with exit code 0
59
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