Erster Anlauf 17 Dimensionen
Genetischer Alg.
Range : -100 und 100
Startwert: 10000
Auswahl der Besten 30
450 Mutationen

Problem: isFeasable immer auf false…
Deswegen ohne Prüfung

Gen 1
Element at 0 with value 0 as 9.02401696815511
Element at 0 with value 1 as -11.783067617228625
Element at 0 with value 2 as 66.98747661810441
Element at 0 with value 3 as -19.410477598594994
Element at 0 with value 4 as 49.45787709439952
Element at 0 with value 5 as -26.12945108390727
Element at 0 with value 6 as -38.902105234693394
Element at 0 with value 7 as -48.973386136411314
Element at 0 with value 8 as 31.876601878596034
Element at 0 with value 9 as 35.36112109613083
Element at 0 with value 10 as 1.2151739331387716
Element at 0 with value 11 as 25.95882310961302
Element at 0 with value 12 as 24.200075621484146
Element at 0 with value 13 as 36.67826624564668
Element at 0 with value 14 as -23.30575427042099
Element at 0 with value 15 as -7.944963955929325
Element at 0 with value 16 as -28.54105976800203
Result of Element 0 : 4.053730322942888E9

Gen 6
Element 0
Element at 0 with value 0 as -0.9104626453370921
Element at 0 with value 1 as -17.592117488401627
Element at 0 with value 2 as -14.940729104341017
Element at 0 with value 3 as -18.470656497525162
Element at 0 with value 4 as -11.71170012395545
Element at 0 with value 5 as 8.065493344331244
Element at 0 with value 6 as 10.105470610923074
Element at 0 with value 7 as 21.18345737649748
Element at 0 with value 8 as 10.685819863166884
Element at 0 with value 9 as 31.20785699665561
Element at 0 with value 10 as -17.87831489241077
Element at 0 with value 11 as 22.83111784958502
Element at 0 with value 12 as 20.305590998779675
Element at 0 with value 13 as -10.98501067472475
Element at 0 with value 14 as -9.953095831805598
Element at 0 with value 15 as -22.063535513159003
Element at 0 with value 16 as -51.912860662149484
Result of Element 0 : 2.33744997454489296E8

Zweiter Anlauf

Gen 0
Element at 0 with value 0 as -22.655170495449923
Element at 0 with value 1 as 23.51536460655555
Element at 0 with value 2 as 31.79663174517836
Element at 0 with value 3 as -45.78663471837208
Element at 0 with value 4 as 6.199341585656114
Element at 0 with value 5 as -62.29340430795449
Element at 0 with value 6 as 55.59544242847073
Element at 0 with value 7 as 22.88880249786851
Element at 0 with value 8 as -23.247583972335278
Element at 0 with value 9 as 6.639193047635985
Element at 0 with value 10 as -25.07882647965991
Element at 0 with value 11 as 39.92106028114563
Element at 0 with value 12 as -16.542717398554913
Element at 0 with value 13 as 32.09343584534403
Element at 0 with value 14 as -10.077767787692537
Element at 0 with value 15 as 43.1235529025644
Element at 0 with value 16 as -13.410838930714135
Result of Element 0 : 1.9226355158666275E7

Gen´3
Element at 0 with value 0 as 8.925294648667819
Element at 0 with value 1 as -9.882870900098915
Element at 0 with value 2 as 6.602248128356789
Element at 0 with value 3 as 11.914973981884998
Element at 0 with value 4 as -14.720758249596942
Element at 0 with value 5 as 7.923715562182509
Element at 0 with value 6 as -9.508758516703956
Element at 0 with value 7 as -18.41978729128985
Element at 0 with value 8 as 18.258633158583
Element at 0 with value 9 as 28.32406754824066
Element at 0 with value 10 as 2.8061102694893636
Element at 0 with value 11 as -20.016705326522967
Element at 0 with value 12 as -31.8600325715312
Element at 0 with value 13 as -6.523239466702977
Element at 0 with value 14 as -20.65035614572043
Element at 0 with value 15 as -7.910285136026749
Element at 0 with value 16 as -12.342649847620272
Result of Element 0 : 1149617.2437977262

-> Werte Range wird kleiner

Generation 4
 [*] Waiting for messages. To exit press CTRL+C
Element 0
Element at 0 with value 0 as 9.002205046547218
Element at 0 with value 1 as -9.228152355625648
Element at 0 with value 2 as 6.275335231570926
Element at 0 with value 3 as 11.38278927606381
Element at 0 with value 4 as -15.492256437929944
Element at 0 with value 5 as 7.399373776725074
Element at 0 with value 6 as -9.398623791150008
Element at 0 with value 7 as 23.369140001607704
Element at 0 with value 8 as 18.29656206183899
Element at 0 with value 9 as 27.464024968248285
Element at 0 with value 10 as 3.728580029622867
Element at 0 with value 11 as -20.32860474227813
Element at 0 with value 12 as -13.792318196838437
Element at 0 with value 13 as -6.785033600710976
Element at 0 with value 14 as -19.935933474785603
Element at 0 with value 15 as -8.029470882347514
Element at 0 with value 16 as -11.314113919232597
Result of Element 0 : 704917.9654557402

Anpassen der Range auf -40 und 30

Gen 0
Element 0
Element at 0 with value 0 as -5.189757715827348
Element at 0 with value 1 as 4.4093741030770275
Element at 0 with value 2 as 14.141750687499595
Element at 0 with value 3 as 9.189915260225852
Element at 0 with value 4 as 12.920934172606799
Element at 0 with value 5 as 3.58855027581167
Element at 0 with value 6 as 5.175448004064549
Element at 0 with value 7 as 7.074003132277191
Element at 0 with value 8 as -4.400168407194947
Element at 0 with value 9 as 1.7027556799254313
Element at 0 with value 10 as 16.453939342341116
Element at 0 with value 11 as -0.5429229282623496
Element at 0 with value 12 as -2.8084599194883424
Element at 0 with value 13 as -11.740190857834367
Element at 0 with value 14 as 2.920884387033226
Element at 0 with value 15 as 12.979302162271594
Element at 0 with value 16 as -18.02117320224122
Result of Element 0 : 140970.64314322727

-> Erste / Nullte Generation wesentlich besser

Gen 5
Element 0
Element at 0 with value 0 as -1.8072233414241439
Element at 0 with value 1 as -0.5936399257468481
Element at 0 with value 2 as 2.638231486773109
Element at 0 with value 3 as -8.51448618135829
Element at 0 with value 4 as -2.2382027495361845
Element at 0 with value 5 as 2.223975848731999
Element at 0 with value 6 as -4.824969982171526
Element at 0 with value 7 as 5.373606926087406
Element at 0 with value 8 as 5.377959010394741
Element at 0 with value 9 as 2.1733112388265834
Element at 0 with value 10 as -8.672418610823327
Element at 0 with value 11 as -0.8582628651463362
Element at 0 with value 12 as 7.923005498325181
Element at 0 with value 13 as -3.2492605953695017
Element at 0 with value 14 as 7.090355774314615
Element at 0 with value 15 as -1.9050103434922596
Element at 0 with value 16 as 5.869923480389534
Result of Element 0 : 7201.3379294171

Wertebereich angepasst auf -10 10
Nur noch die 10 Besten
100 Mutationen
Startwerte immer noch 10000
Abbruch bei > 0

Gen 0
Element 0
Element at 0 with value 0 as -4.546964023043736
Element at 0 with value 1 as -0.23665281211891198
Element at 0 with value 2 as -1.166984031468841
Element at 0 with value 3 as 2.1854236736864223
Element at 0 with value 4 as -2.1811031023413268
Element at 0 with value 5 as -1.1652761319572704
Element at 0 with value 6 as 4.951500388081465
Element at 0 with value 7 as -3.619019064223618
Element at 0 with value 8 as -2.0921316184455456
Element at 0 with value 9 as 4.111019076702178
Element at 0 with value 10 as 4.337675660146756
Element at 0 with value 11 as 1.987830123320613
Element at 0 with value 12 as -3.2322967471169717
Element at 0 with value 13 as -5.527872223589032
Element at 0 with value 14 as -6.126430315017877
Element at 0 with value 15 as -2.538184148690073
Element at 0 with value 16 as 0.38448728429357004
Result of Element 0 : 574.0536559002043

-> Wesentliche Verbesserung

Gen 1
Element 0
Element at 0 with value 0 as 2.4941709934936203
Element at 0 with value 1 as -3.6571862208716026
Element at 0 with value 2 as 2.376362017660383
Element at 0 with value 3 as -2.2353881477007578
Element at 0 with value 4 as -2.730900786095349
Element at 0 with value 5 as 2.9322093781184377
Element at 0 with value 6 as 0.12431874485567562
Element at 0 with value 7 as -4.013723476545503
Element at 0 with value 8 as -4.479462104898547
Element at 0 with value 9 as -0.11176662502648604
Element at 0 with value 10 as -3.267264095309555
Element at 0 with value 11 as 1.1365950823679372
Element at 0 with value 12 as 3.6208304491499517
Element at 0 with value 13 as 4.036121743040885
Element at 0 with value 14 as -3.4887077672255957
Element at 0 with value 15 as -3.812710047751302
Element at 0 with value 16 as 4.421296592338208
Result of Element 0 : -197.31536444211983

->
Wertebereich verkleinern -4 und 4
Abbruch verändern -1000

Gen 0
Element at 0 with value 0 as -0.45470754175895145
Element at 0 with value 1 as -3.3324340493052675
Element at 0 with value 2 as 3.4258028130908045
Element at 0 with value 3 as -2.817159689628463
Element at 0 with value 4 as -2.8257023478556285
Element at 0 with value 5 as -0.8456134324791602
Element at 0 with value 6 as -2.042136018224869
Element at 0 with value 7 as -1.158055198597455
Element at 0 with value 8 as -3.098411117990624
Element at 0 with value 9 as -2.5223626956383134
Element at 0 with value 10 as -3.3263013698810076
Element at 0 with value 11 as -2.6680338501472294
Element at 0 with value 12 as -3.0864831300090705
Element at 0 with value 13 as -2.3541269321139353
Element at 0 with value 14 as 3.4704925266585667
Element at 0 with value 15 as 1.810763671909445
Element at 0 with value 16 as -1.785188996897598
Result of Element 0 : -462.01903961630427

Geringere Population -> deutlich schneller

Generation 7
Element at 0 with value 0 as 2.9414916270420184
Element at 0 with value 1 as -3.1275666662827994
Element at 0 with value 2 as 0.013913745411407503
Element at 0 with value 3 as -2.919534407836712
Element at 0 with value 4 as 2.066008115756965
Element at 0 with value 5 as 2.529399864710472
Element at 0 with value 6 as -3.0507257926141564
Element at 0 with value 7 as 2.305521848824039
Element at 0 with value 8 as -2.8560123289118464
Element at 0 with value 9 as -1.8293987650168566
Element at 0 with value 10 as -2.321298921283806
Element at 0 with value 11 as -2.9868978157122443
Element at 0 with value 12 as 1.9304711824026213
Element at 0 with value 13 as -2.777331595638625
Element at 0 with value 14 as -2.262537876335098
Element at 0 with value 15 as 1.946672349853257
Element at 0 with value 16 as -2.5683623139833496
Result of Element 0 : -491.93258960460844

-> Werte werden schlechter
-> nimmt Alg. nicht alle auf ?
-> großer Unterschied der einzelnen Variablen ?
-> Werte werden mit zunehmender dauer schlechter

Niedrigstes Ergebnis -> Gen 7

-> Schwankungen bei Ergebnis
-> Elg bleiben besten immer erhalten
-> Warum nicht hier
Bis Gen 47 kaum Verbesserung zwischen -300 und - 400 schwankend

Neustart mit mehr Mutationen
Anmerkungen. Mutationen werden geklont, nicht überschrieben.
Überlegung: Gute werden evtl. unnötig mutiert und überschrieben.
Mutationen: 200

Element 0
Element at 0 with value 0 as -2.0403014489216584
Element at 0 with value 1 as -3.2593148504132756
Element at 0 with value 2 as 1.6062807210220518
Element at 0 with value 3 as -2.0883373850078675
Element at 0 with value 4 as -2.1276693725870137
Element at 0 with value 5 as -2.935709395654409
Element at 0 with value 6 as -2.281179997964159
Element at 0 with value 7 as -3.243494731375046
Element at 0 with value 8 as 2.260151414724189
Element at 0 with value 9 as 0.6639866148855349
Element at 0 with value 10 as 2.5830874009192275
Element at 0 with value 11 as -3.1123150711649723
Element at 0 with value 12 as 1.541489594751691
Element at 0 with value 13 as -3.458360532760742
Element at 0 with value 14 as -2.72289540782627
Element at 0 with value 15 as -1.9935255581838316
Element at 0 with value 16 as -2.481210807575213
Result of Element 0 : -487.6205959588877

Generation 9
Element 0
Element at 0 with value 0 as -2.749662996678939
Element at 0 with value 1 as -2.4223873423851794
Element at 0 with value 2 as 2.8701757379770214
Element at 0 with value 3 as -2.8136838936305115
Element at 0 with value 4 as -2.716331766158797
Element at 0 with value 5 as 2.240944278305262
Element at 0 with value 6 as -2.9261047454386153
Element at 0 with value 7 as 1.0858151715187234
Element at 0 with value 8 as -2.229001900284313
Element at 0 with value 9 as 3.270946042705045
Element at 0 with value 10 as -2.948986854571422
Element at 0 with value 11 as -2.3316239091131075
Element at 0 with value 12 as -2.606103195133187
Element at 0 with value 13 as -2.559995872129254
Element at 0 with value 14 as -2.546919419069448
Element at 0 with value 15 as 3.239096306169282
Element at 0 with value 16 as -2.406929758939043
Result of Element 0 : -539.7007831520406

Viele Startwerte
ca. 30 Beste
und 300 Mutationen
liefert schnell gute Ergebnisse

Generation 5
Dimension 0 with value: -3.1916840763274834
Dimension 1 with value: -3.274100924200547
Dimension 2 with value: -2.695685379058683
Dimension 3 with value: 1.6563923318760787
Dimension 4 with value: -3.558227358645396
Dimension 5 with value: -2.889054719646805
Dimension 6 with value: -2.4364587652098764
Dimension 7 with value: -2.6054027178635804
Dimension 8 with value: -2.5905952775767545
Dimension 9 with value: -2.392343412594756
Dimension 10 with value: -1.8867208572332927
Dimension 11 with value: 3.260831666567854
Dimension 12 with value: 2.8337716916611693
Dimension 13 with value: -2.6398821748996903
Dimension 14 with value: -2.44336546327291
Dimension 15 with value: -2.1260033927496798
Dimension 16 with value: -1.9353703704258742
Result of Best Element: -547.881147859163

Generation 6
Dimension 0 with value: -2.944852386670229
Dimension 1 with value: -2.809420736111674
Dimension 2 with value: 2.94179110878588
Dimension 3 with value: -2.450611504175148
Dimension 4 with value: -2.7293473375937354
Dimension 5 with value: -3.1740772249720193
Dimension 6 with value: -1.9839274993001146
Dimension 7 with value: -2.4008414931142013
Dimension 8 with value: -2.575689269095781
Dimension 9 with value: -2.858044948254509
Dimension 10 with value: -0.9887626128377232
Dimension 11 with value: -2.7106131372909177
Dimension 12 with value: 1.0181283160558499
Dimension 13 with value: -3.4552176682544973
Dimension 14 with value: -2.4481073273982714
Dimension 15 with value: -3.4116265236525782
Dimension 16 with value: -2.6722165131428657
Result of Best Element: -550.8153925192415

Generation 9
Dimension 0 with value: -2.845232561784274
Dimension 1 with value: 2.901713226539287
Dimension 2 with value: -3.0044581067646807
Dimension 3 with value: 2.2244512350625287
Dimension 4 with value: -2.793140136853993
Dimension 5 with value: -3.2655588074058124
Dimension 6 with value: -2.986727131913874
Dimension 7 with value: -2.3217520631972652
Dimension 8 with value: -2.8254545357088245
Dimension 9 with value: -2.6514781921453636
Dimension 10 with value: 2.161615135655402
Dimension 11 with value: 2.797223636237651
Dimension 12 with value: 2.5445896436203586
Dimension 13 with value: 2.114834354205926
Dimension 14 with value: -2.7445063272486374
Dimension 15 with value: -2.79796596397865
Dimension 16 with value: -2.3985935015823796
Result of Best Element: -554.9993386109861

Bisher Bester Wert
Generation 10
Dimension 0 with value: -2.9883899123337234
Dimension 1 with value: -3.4615617161852166
Dimension 2 with value: -2.7924103827435776
Dimension 3 with value: 2.1974011296671407
Dimension 4 with value: -2.777220477239749
Dimension 5 with value: -2.9984579100269197
Dimension 6 with value: -2.835116984633576
Dimension 7 with value: -2.191915543432801
Dimension 8 with value: -2.845613157832519
Dimension 9 with value: -2.7474811128576655
Dimension 10 with value: -2.689651186777686
Dimension 11 with value: 3.001537836922715
Dimension 12 with value: 2.261869898385324
Dimension 13 with value: 2.135746662849333
Dimension 14 with value: -2.7298153370965292
Dimension 15 with value: -2.9519591744797253
Dimension 16 with value: -2.4928637358709436
Result of Best Element: -579.2352715521621