

atol= 1.0000000000000001e-20  
Number of iterates= 30  
initial point= [-0.48255541 -0.40253848]  
function value at initial point=  
0.128237859762474942741069510004507674930944699182787418825980070430075596034129  
90442635577008459414228730211088529586207546356805546881725633202858670916422013  
255582818873754796686610614239371621214457  
Value of the system of equations at initial point  
[ 0.50634995438972398760861234450885902924644344321976002539891972114969352777850  
72612239606285780900912368362380752759488556232397678434813025416542160147313862  
7276942921479051488988523548067334036969855]  
[0.009243549884883130418912568089239773599981605171093231740758688537391329957360  
42406229129229594631775641157718884525559903597434872777489612798492256466882789  
29482077798433685963719388681455956995465753]  
Value of the Jacobian of the system of equations at initial point [-  
0.022801260190068332472281387922871780573740589096210392738354901152194417641778  
47937192388640778857342333101284478905811014878286249772761678172699483150547306  
9418994697804957437627468792409656542422204 -  
0.009796884535016249787443253701389301467085263681968012587452277008871750655854  
46336711642474749539453509830633758131628348397279478643806889158298162705736194  
28413301976433766063482559175045382241250238]  
[0.009796884535016249787443253701389301467085263681968012587452277008871750655854  
46336711642474749539453509830633758131628348397279478643806889158298162705736194  
28413301976433766063482559175045382241250238 -  
0.022801260190068332472281387922871780573740589096210392738354901152194417641778  
47937192388640778857342333101284478905811014878286249772761678172699483150547306  
9418994697804957437627468792409656542422204]  
Value of the gradient of the cost function at initial point [-  
0.011635975048185191482233209647437167007563469395052767103027879879113795741409  
72552677070760160530974225119962876612856467742964455043135075694033808914760333  
7116686942122003807143533030721255924784726  
0.004749887451461774271827128121805262588023932059039027424212971880947689698147  
00337698914020129860518744490185340679497724885483715126613034924991701131273313  
89547344229080602614481804999800701864763999]  
Value of Jacobian multiplied with the system at initial point [-  
0.011454859066353466671567040732455092313713574713190673276374826038979313076012  
15937980547280338917466971294771087739732526790665333881110664751606641434164264  
6670953290469556646575164916115615159982643]  
[-  
0.005171416623471966815291699696896451777044661110039386202915416640507388286300  
25487089485044502752115035485161086851459471377520626072484780007219952202400342  
02619685380655379282034923791474428742458972]  
Value of the Hessian of the cost function at initial point  
[ 0.0128616118609992446781463186230041729631981941061051560520047125293083006172  
58779797609442135250938362808141075086780995479789204263238834100081164565560410  
309463548861223122744536168831311557832440776 -  
0.000386210521661898430799173776447411037386508939808561540972642212161339532521  
36860534129892936926161733738686556877215982052915166255350515741491349475993160  
106360965637452124866407075512370621950530485]  
[-  
0.000386210521661898430799173776447411037386508939808561540972642212161339532521  
36860534129892936926161733738686556877215982052915166255350515741491349475993160

106360965637452124866407075512370621950530485 -  
0.011629859035303973618411453803035670982338113213301673691762731558236803458857  
21040119763383141168264592290209213813770245461892198422932356620801151207764621  
4535671063825837544374401625359165022665134]  
z00\_old= [ 0.0]  
[1000000000.93333327770233154296875]  
The point =  
[0.042000683941829000036753642656405832200226721951032024229960769928050077779595  
04923202453472115748626868311920428797927028552992429180349313148553831071648764  
2138175063519242362507144590207013608594091]  
[ 1000000001.00947586022751877747185082486239104560323326436500002262402302306553  
12142352065016259276360810692490886226495879367155911997998926320791172441100912  
980004889347531459040134501321161388083997]  
The function value =  
(4.160621536452838947783852592707645133045604752040288039708707908697564657217962  
55707381006257567206101085370981149513016195722414818272780601532291159542768198  
49587030289321659105857342419198566836321e-341094072 +  
3.342917456905870240851740396818460808545065323521695707220627296746136303602803  
37991328729181917640831459177165470484234708715139404043733591359409228910220581  
64280643617027641907733881219978978078758e-341094072j)  
The learning rate = 1  
The iterate = 0  
The point = [-  
0.0111667659735294246677143075925074189888784426434834336169002516912505772211810  
27403108570231633688509356253125671172968831871525192069526794778425067724579063  
660111532384027863522058020080082063452403]  
[ 1000000001.6162098628713329530471393156391577390510047306109951027060513957158  
18540548061257111130700454413079236009471851662310871987505417657060332218757634  
4571028502190327953671663796538214187294072]  
The function value =  
(3.041775467559196688497250449617700730423413618303762118664223980029836125968992  
10184366633380633304414715538880641534348470964274742000434224731730583315032472  
81370271319479531070918798550053379945752e-341094072 +  
3.246681865914203189606699205607680727657340217240243088370815597892874439675451  
86579273363736766162475200710090552316546798006585246046758069678611971527256227  
94195974377461952746438371894613980985161e-341094072j)  
The learning rate = 0.5  
The iterate = 1  
The point =  
[0.036462409595137219679368010158046992204498127916686972837270212482614309001548  
92589536171677086520178620765278159272650588228941660619877239211037098918614533  
4718206187758957993240785722761480994312472]  
[ 1000000001.63466004716613594761310845833329609123045039618525173278647501884944  
55396357865501302205736931675807483446548564675050251002023323845120032635926316  
339534285377463258055385704314332681512464]  
The function value =  
(2.099907259547943789303436849490881410861349419183675237599182290984886138671844  
09119471749629426974759287433882621657309728534543400431295521765471326304154604  
74908665158141637476712266059806884896605e-341094072 +  
1.672471929065210457492608015438976529165111082066338002540892392660164158575684  
64002540366904026927646725949521970742256805078935392569184314139599555393027694  
77165314607737501782923606782910424426195e-341094072j)

The learning rate = 1

The iterate = 2

The point =

[0.083474274380366720354539937073415849847679933961933764177755695557878589323529  
67657250071829653280420029133710570044046262727900710978918621007747131804220398  
7782139876036116002141780406630802472772475]

[ 1000000001.6565698659691134470199680226463274398800360147256250192046747348095  
90757306051186606849434508098166961195503772035778673674518150797347725876287056  
722942933335905033528420559781299230046362]

The function value =

(1.428249141377831909580718726838450641333500378495733170186906121930993498210069  
01161309362623625377325528068698257221329926263401406410894050018791326711602669  
04909542503988828512133585702290179444361e-341094072 +  
7.615637202407627563747240020775604961172634772484894631717778271277058292771538  
17616046057446433273358740401362917324855348136534997128755346031038955692098278  
21796943737742895301789722002579018374402e-341094073j)

The learning rate = 1

The iterate = 3

The point =

[0.129821972487099182395932438667667408306938754858228045745088193930647551861611  
49787301967454690265750458188086001055646562533051418867429809634081279911592699  
561783235737555528479110591073405866300263]

[ 1000000001.68198477378018454996656482513413563179975648791455531690813779342595  
47148009031329382755619256541816363573513644375176028105356781872244564949584254  
413867375811627120238097942108483946050372]

The function value =

(9.400328423912106012386143934101051282983058790682774426340599139570198246192249  
61582105188002878298421582379662972003189024786075556479697199024175383939011539  
75038234912920424807335962921150530106823e-341094073 +  
2.586545134687150404540755181368444706931033929667268917061262496495309286309462  
55044929597125240047866119198429175913626776939565958416843441042642837114440338  
24606271819788032044749936836232986576133e-341094073j)

The learning rate = 1

The iterate = 4

The point =

[0.175398904779884479303562079067719938255212448701653461029914414150998192502442  
61675383467173355362847496770342518469406785390705656018291058476931560619687785  
964247252662327117653291143095619113210017]

[ 1000000001.71143599156459150777515712996191073824402400690804022497107170942412  
65481855328757788505946488106331199774661150589417662879794995623921138959356176  
662395265420437047621606476376964142339522]

The function value =

(5.866713503662980817327845462851937411635711736658220750708625597489354441175426  
60528087145835100238490980683150833323956203922654118941287332018675254662587409  
75719455066557316518472246304059310284534e-341094073 +  
1.101047051392573907724006274973315796556716925305815743547117246769372275327648  
2208019070811122008050648884884556617275624307041964450362173776223438165965792  
00215081040789961587036343173629392342815e-341094075j)

The learning rate = 1

The iterate = 5

The point =

[0.219582162393166739122607117093763823945406969500445941100162319861059235795577

94042857554012711909879557599811135482363934287473008432292158450278091474343880  
164879155645595238268097412103016736130407]  
[ 1000000001.75123933146289979135261213415344750884773367981374996063533677885970  
14529374195360132580716475292195961293723096126743274711051073047711791738129148  
059683227586341984841972614204848385273533]

The function value =

(3.274580755988510723158309730494182360701947838554651460364843323081960584369614  
19232158180842551457691568824727809312710317585379421555909391905628514306186486  
24201020593977416806863643125398617734051e-341094073 -  
1.303484022896937241973343986224314298806528211216966981922657766933633142982065  
56949562565174810272215366475512733434809522245290826140735625286232273039961055  
94423472509469624980407237999225663663833e-341094073j)

The learning rate = 1

The iterate = 6

The point =

[0.258566910613428806892375906875639407879863337098339451863840074768832806857367  
84541260639083588740522536557791583728492995062590346076314283526344497367556797  
505258763559931139379632211334797612824189]  
[ 1000000001.84655482908704696792527382638819083894219494483136472915821223784595  
57777535942956272877999036105863316240330231319827815707297172396408045834074447  
475578423508232316178081352574758912974173]

The function value =

(3.875043353175281030914196199043963869204616271433872704640486140356172841212604  
65490660770851742790722745137875781283607703726877664377124957756398563575237345  
43038893264532078287378833481764733891325e-341094074 -  
2.049727338872345876899591938326223922340095934657224012984944861019547973005107  
03960249279100187759281395868859887446622496127275086847339528512378174921364177  
74117575071335184644461484528830817540833e-341094073j)

The learning rate = 1

The iterate = 7

The point =

[0.300906047981113792161815928168776147598304007837472315631255464475360456366126  
75897500924965057198734718444252494117807059139370182263121679323867701765176920  
536066607199109083791976117569420978471788]  
[ 1000000001.89549681989614998892685619967959392470437309488242257247300534321241  
24120032115849134126131691553047652443723064293348070112276632522798033585208954  
207760042233696878135263027300267056952757]

The function value = (-

4.095480849675980369947053133419702422365418539617396564331806180544602686139338  
48760285386196957949399899277006764240321417458433471303273912742323855371703401  
89029043877215675736423645777905492113234e-341094074 -  
1.138771285537373937616268725306201608311318712097744898747241269961573065226203  
28106123866547146542842333101704616087354322168610224714649713692205060846705907  
7104463494703590137677340066369091642728e-341094073j)

The learning rate = 1

The iterate = 8

The point =

[0.343049251481863858643121587312482705402828841419217542493198305988087142948051  
31415977257793030258166634929140144472292922447064426671040444756179565035952946  
227554214757608669477856553163884661068752]

[ 1000000001.92075114328236348203976609282787153950772633947794282926877463897405  
20649032035187018493227483168042682398003129909865141722912104605591004548126709  
821108515929837429219806783569706521884796]

The function value = (-

4.059823336704513732023631914535192775725383375222952140682461500813562629287577  
22841758143294508236978286697034107450491874442338063525308535256127167098792413  
10998630470664045299526520436589950117423e-341094074 -

5.5768861535133418692183558261114638640631552754908941107719352275406174563980741  
18651228157498237477643682397827707779483982132405911278354512051219585578988556  
4381154904489030165300314339015700081292e-341094074j)

The learning rate = 1

The iterate = 9

The point =

[0.383058222750981834606943514233373419935753513324965608812613478382638498958755  
20361387556551059408640365807009344393408998644227114493707186813196416505362203  
507612386884509726575884705207480220872453]

[ 1000000001.93427203081637831240092659923383890366269293901719220692720577664603  
49802160939497900247361282834226242793687801071079101250635403241692518356436227  
014538310098504835382190198405310579681054]

The function value = (-

2.731990880483293039165822361213418780296443905007848241876949890545788019518014  
50876982451336486554997115922041922843901998020860803652065158937520938193768615  
35326628449795601673521593052184546393068e-341094074 -

2.722938941976798470814447435181097466324761380837289517011674078082526744079125  
04226924265412254697749199533039773425011242287171153226335575223582754982701089  
08698689002417867350161880727487650853126e-341094074j)

The learning rate = 1

The iterate = 10

The point =

[0.419891717134216092187310256934383357234378554945950072996877658149706228750545  
95216518297328895567893449345633190491372074331393235335846892853812097148576637  
229646987748329472143682200064642355372904]

[ 1000000001.93655937864403331424316612572091092184779443612896069570639723139096  
44807257732495250232278322681191095590833315863768430822447877072729183558719624  
94902272926941693736225480861564642182566]

The function value = (-

1.521949282600506645120856336311905811498873890584173158407213352486647354041286  
27662754268734521682520348463377911952612444894005919050906649132110569098109001  
86448746526788775469122350733279706677055e-341094074 -

1.480159157538438358646249816067743608346085586101688372265097909458270309328294  
30488908021729294144122615106272087252012060813390292075556770628095674116327291  
11390317303842463519737139866506664982368e-341094074j)

The learning rate = 1

The iterate = 11

The point =

[0.454308709328367258412177594449967728728549469912505189737761128770247800440591  
60919713745590132272209098548497689105692209548950082891375704449948711740003509  
721451612036950748259599738114533866506455]

[ 1000000001.91998716227117239173737131396447303075106296434577255078094391745492  
60969851067698775660593748828583171974965965789152632370971947118252685136277415  
616781514359418252520636921221196207153606]

The function value = (-

4.744521014714948930795469274411907409186576920854225869242954793402897329342077  
46828352737084542899494168335952934795469279173164102155333541330819670705355714  
24969226918745187822919589409981580016434e-341094075 -  
9.579155698091380381420914953489252104556693473769790496946225236253122131923649  
57678253838302404658966960980049796486960617554367021083853239182609279512381844  
54163754589104462377006397849449910150759e-341094075j)

The learning rate = 1

The iterate = 12

The point =

[0.485872831049719673907376773341062653038638640144388825324242503069668370932925  
20744008790583880307309285236464217968422289718487720151846147631696941470242257  
834465696753431735475992274602751661244556]  
[ 1000000001.90544491835753449822124823883900321416648273516819416557832029068595  
93424233176748442780729659417636241513560721048256440247543086302637403105078789  
439366905484247360874984771976059258535745]

The function value =

(7.985809431591165159727339910932431905812603248016363822858953417191272017585755  
37611506880535596301630565589236389104783891718028956196218012907534415764935410  
00006933240733304508857702777408658562358e-341094076 -  
3.261033174311869998841792669853901833630038347926095969574363730392978723768986  
03562810859683346588614541141126412559725991992865142953762577613881425832585435  
21908245678127552655959632004225441850331e-341094075j)

The learning rate = 1

The iterate = 13

The point =

[0.498791464808848849599048769083403612047494871986106423967707313513559544106179  
79415598733067052779859837790061464025773372900381085365613501950296347483808505  
42462903069196684081007750847895015279336]  
[1000000001.908859070087741568429779682239470856613015067505142081010732624832861  
49333581937416867833278246001520544885099103531547723352323891370654537318270549  
21162895085166386693631081098707443871781]

The function value =

(2.183060624508972328473513184784188239891836633800097964808804228194766096604875  
22226356407804985732162517155623035338266119167209130816718613360865515303891425  
4184423998445318908223616024625504246656e-341094076 -  
2.691986483892342422661575557756873783768310963238688924655656730551508907724646  
10734266019236799520874615892385688850456592864903598287850194435066799031030119  
20112166612658983410336717773725009583132e-341094076j)

The learning rate = 1

The iterate = 14

The point =

[0.499988286035858609089706907319263868229786217250788741956368358312333266663882  
19555040923989580468267038980254055975022120138875099726702026513093368051794181  
538589985541218421833713799236275640152573]  
[ 1000000001.90983023952546402983425618166704929804660862322285212594988536648999  
06459910349643138940075527169816236018214987924136733399113221833172339627173202  
010159743778333457851507209729509674075081]

The function value =

(4.475074522021573017063358508885565826399682213533243826818420009133554555083416  
81456682726963340518261359255813588514682860089698538020744501371723002372625526  
05609322354884683358372653186579255760998e-341094078 -

2.585468865776236429274194317092110724001673959327214814462608865245384272228614  
66823434761863561861384053962729193922214213073092286138954680342741832455039960  
89843910576474647085164703094761442274413e-341094078j)

[1000000001.9098505173208544921453764429077427970089304959331882496393260943191716479864695135197665458694720064828650108798551674414991444115717019435267067878519048799717037119725842010613883086902432]



The function value = (-  
5.873159023022544541924064820514368686527882504331860966372498377032232948929068  
31730214005121402226258183040028388626107815419437817849190825204141614740624879  
55974801674243506437440582115746811058392e-341094268 +  
6.156557788696719266718900578641457262812408722761427792352154210603756864965347  
09155960611428713674900663648624018441282281357530474140104957613675305230784720  
47448514822467217310265658459552406081509e-341094284j)  
The learning rate = 4.082563051969564e-202  
The iterate = 22  
The point = [  
0.5]  
[1000000001.909850517320854492145376442907742797008930495933188249639326094319171  
64798646951351976654586947200648286501087985516744149914441157170194352670678785  
19048799717037119725842010613883086902432]  
The function value = (-  
5.873159023022544541924064820514368686527882504331860966372498377032232948929068  
31730214005121402226258183040028388626107815419437817849190825204141614740624879  
55974801674243506437440582115746811058392e-341094268 +  
6.156557788696719266718900578641457262812408722761427792352154210603756864965347  
09155960611428713674900663648624018441282281357530474140104957613675305230784720  
47448514822467217310265658459552406081509e-341094284j)  
The learning rate = 4.082563051969564e-202  
The iterate = 23  
The point = [  
0.5]  
[1000000001.909850517320854492145376442907742797008930495933188249639326094319171  
64798646951351976654586947200648286501087985516744149914441157170194352670678785  
19048799717037119725842010613883086902432]  
The function value = (-  
5.873159023022544541924064820514368686527882504331860966372498377032232948929068  
31730214005121402226258183040028388626107815419437817849190825204141614740624879  
55974801674243506437440582115746811058392e-341094268 +  
6.156557788696719266718900578641457262812408722761427792352154210603756864965347  
09155960611428713674900663648624018441282281357530474140104957613675305230784720  
47448514822467217310265658459552406081509e-341094284j)  
The learning rate = 4.082563051969564e-202  
The iterate = 24  
The point = [  
0.5]  
[1000000001.909850517320854492145376442907742797008930495933188249639326094319171  
64798646951351976654586947200648286501087985516744149914441157170194352670678785  
19048799717037119725842010613883086902432]  
The function value = (-  
5.873159023022544541924064820514368686527882504331860966372498377032232948929068  
31730214005121402226258183040028388626107815419437817849190825204141614740624879  
55974801674243506437440582115746811058392e-341094268 +  
6.156557788696719266718900578641457262812408722761427792352154210603756864965347  
09155960611428713674900663648624018441282281357530474140104957613675305230784720  
47448514822467217310265658459552406081509e-341094284j)  
The learning rate = 4.082563051969564e-202  
The iterate = 25

The point = [

0.5]

[1000000001.9098505173208544921453764429077427970089304959331882496393260943191716479864695135197665458694720064828650108798551674414991444115717019435267067878519048799717037119725842010613883086902432]

The function value = (-

5.8731590230225445419240648205143686865278825043318609663724983770322329489290683173021400512140222625818304002838862610781541943781784919082520414161474062487955974801674243506437440582115746811058392e-341094268 +

6.1565577886967192667189005786414572628124087227614277923521542106037568649653470915596061142871367490066364862401844128228135753047414010495761367530523078472047448514822467217310265658459552406081509e-341094284j)

The learning rate = 4.082563051969564e-202

The iterate = 26

The point = [

0.5]

[1000000001.9098505173208544921453764429077427970089304959331882496393260943191716479864695135197665458694720064828650108798551674414991444115717019435267067878519048799717037119725842010613883086902432]

The function value = (-

5.8731590230225445419240648205143686865278825043318609663724983770322329489290683173021400512140222625818304002838862610781541943781784919082520414161474062487955974801674243506437440582115746811058392e-341094268 +

6.1565577886967192667189005786414572628124087227614277923521542106037568649653470915596061142871367490066364862401844128228135753047414010495761367530523078472047448514822467217310265658459552406081509e-341094284j)

The learning rate = 4.082563051969564e-202

The iterate = 27

The point = [

0.5]

[1000000001.9098505173208544921453764429077427970089304959331882496393260943191716479864695135197665458694720064828650108798551674414991444115717019435267067878519048799717037119725842010613883086902432]

The function value = (-

5.8731590230225445419240648205143686865278825043318609663724983770322329489290683173021400512140222625818304002838862610781541943781784919082520414161474062487955974801674243506437440582115746811058392e-341094268 +

6.1565577886967192667189005786414572628124087227614277923521542106037568649653470915596061142871367490066364862401844128228135753047414010495761367530523078472047448514822467217310265658459552406081509e-341094284j)

The learning rate = 4.082563051969564e-202

The iterate = 28

The point = [

0.5]

[1000000001.9098505173208544921453764429077427970089304959331882496393260943191716479864695135197665458694720064828650108798551674414991444115717019435267067878519048799717037119725842010613883086902432]

The function value = (-

5.8731590230225445419240648205143686865278825043318609663724983770322329489290683173021400512140222625818304002838862610781541943781784919082520414161474062487955974801674243506437440582115746811058392e-341094268 +

6.156557788696719266718900578641457262812408722761427792352154210603756864965347

09155960611428713674900663648624018441282281357530474140104957613675305230784720  
47448514822467217310265658459552406081509e-341094284j)  
The learning rate = 4.082563051969564e-202  
The iterate = 29