

HIMMELBLAU

Mk function: @(x)hessf(x)

x0 = [-1.20 ; 1.00]

.. #	0: R=	NaN	f(x)=	125.11	x(1)=	-1.2	x(2)=	1	step=	NaN	crate=	NaN	gradf =	53.112
Gr # 1:	R=	0.83975	f(x)=	27.301	x(1)=	-2.868	x(2)=	3.87	step=	0.0625	crate=	NaN	gradf =	81.311
NF # 2:	R=	0.47927	f(x)=	1.1598	x(1)=	-2.8036	x(2)=	3.2968	step=	1	crate=	NaN	gradf =	14.369
NF # 3:	R=	0.67355	f(x)=	0.0052912	x(1)=	-2.8046	x(2)=	3.1427	step=	1	crate=	0.26715	gradf =	0.92645
NF # 4:	R=	0.77279	f(x)=	1.4916e-07	x(1)=	-2.8051	x(2)=	3.1314	step=	1	crate=	0.073871	gradf =	0.0049016
NF # 5:	R=	0.78155	f(x)=	1.2136e-16	x(1)=	-2.8051	x(2)=	3.1313	step=	1	crate=	0.0053469	gradf =	1.3981e-07

Mk function: @(x)hessf(x)

Hessian approximation at last iterate (rank = 2, condition = 1.242283e+00, eigenvalues = (64.8404, 80.5501)):

64.9494998551747	1.3047777324691
1.3047777324691	80.4409448262722

Hessian (exact) at last iterate (rank = 2, condition = 1.242283e+00, eigenvalues = (64.8404, 80.5501)):

64.9494998551747	1.3047777324691
1.3047777324691	80.4409448262722

x0 = [-1.20 ; 1.00]
x = [-2.80511809 ; 3.13131252]
f(x) = 1.2135569e-16
#it = 5 #f = 20 #gradf = 6 #hessf = 5

Mk function: @(x)diag(diag(hessf(x)))

x0 = [-1.20 ; 1.00]

.. #	0: R=	NaN	f(x)=	125.11	x(1)=	-1.2	x(2)=	1	step=	NaN	crate=	NaN	gradf =	53.112
Gr # 1:	R=	0.90734	f(x)=	27.301	x(1)=	-2.868	x(2)=	3.87	step=	0.0625	crate=	NaN	gradf =	81.311
NF # 2:	R=	0.50745	f(x)=	1.2078	x(1)=	-2.8355	x(2)=	3.2986	step=	1	crate=	NaN	gradf =	14.578
NF # 3:	R=	0.72586	f(x)=	0.0064933	x(1)=	-2.8096	x(2)=	3.1434	step=	1	crate=	0.27498	gradf =	1.0111
NF # 4:	R=	0.80289	f(x)=	2.8759e-06	x(1)=	-2.8054	x(2)=	3.1315	step=	1	crate=	0.080623	gradf =	0.019763
NF # 5:	R=	0.80755	f(x)=	9.4538e-10	x(1)=	-2.8051	x(2)=	3.1313	step=	1	crate=	0.022672	gradf =	0.00037686
NF # 6:	R=	0.80742	f(x)=	3.0811e-13	x(1)=	-2.8051	x(2)=	3.1313	step=	1	crate=	0.017239	gradf =	6.4709e-06
NF # 7:	R=	0.80742	f(x)=	1.004e-16	x(1)=	-2.8051	x(2)=	3.1313	step=	1	crate=	0.01898	gradf =	1.2281e-07

Mk function: @(x)diag(diag(hessf(x)))

Hessian approximation at last iterate (rank = 2, condition = 1.238515e+00, eigenvalues = (64.9495, 80.4409)):

64.9494999217264	0
0	80.4409447940155

Hessian (exact) at last iterate (rank = 2, condition = 1.242283e+00, eigenvalues = (64.8404, 80.5501)):

64.9494999217264	1.30477772692401
1.30477772692401	80.4409447940155

x0 = [-1.20 ; 1.00]
x = [-2.80511809 ; 3.13131252]
f(x) = 1.0039683e-16
#it = 7 #f = 26 #gradf = 8 #hessf = 7

Mk function: @(x)hessf(x0)

x0 = [-1.20 ; 1.00]

.. #	0: R=	NaN	f(x)=	125.11	x(1)=	-1.2	x(2)=	1	step=	NaN	crate=	NaN	gradf =	53.112
Gr # 1:	R=	0.83975	f(x)=	27.301	x(1)=	-2.868	x(2)=	3.87	step=	0.0625	crate=	NaN	gradf =	81.311
Gr # 2:	R=	0.83975	f(x)=	9.5784	x(1)=	-2.8313	x(2)=	2.6001	step=	0.015625	crate=	NaN	gradf =	32.756
Gr # 3:	R=	0.83975	f(x)=	0.016405	x(1)=	-2.8032	x(2)=	3.1111	step=	0.015625	crate=	0.40285	gradf =	1.6116
Gr # 4:	R=	0.83975	f(x)=	0.00098129	x(1)=	-2.8047	x(2)=	3.1362	step=	0.015625	crate=	0.0492	gradf =	0.39821
Gr # 5:	R=	0.83975	f(x)=	6.6971e-05	x(1)=	-2.8052	x(2)=	3.13	step=	0.015625	crate=	0.24709	gradf =	0.10383
Gr # 6:	R=	0.83975	f(x)=	4.4544e-06	x(1)=	-2.8051	x(2)=	3.1316	step=	0.015625	crate=	0.26074	gradf =	0.026791
Gr # 7:	R=	0.83975	f(x)=	2.9829e-07	x(1)=	-2.8051	x(2)=	3.1312	step=	0.015625	crate=	0.25803	gradf =	0.0069319
Gr # 8:	R=	0.83975	f(x)=	1.994e-08	x(1)=	-2.8051	x(2)=	3.1313	step=	0.015625	crate=	0.25874	gradf =	0.0017923
Gr # 9:	R=	0.83975	f(x)=	1.3335e-09	x(1)=	-2.8051	x(2)=	3.1313	step=	0.015625	crate=	0.25856	gradf =	0.0004635
Gr # 10:	R=	0.83975	f(x)=	8.9172e-11	x(1)=	-2.8051	x(2)=	3.1313	step=	0.015625	crate=	0.2586	gradf =	0.00011986
Gr # 11:	R=	0.83975	f(x)=	5.9631e-12	x(1)=	-2.8051	x(2)=	3.1313	step=	0.015625	crate=	0.25859	gradf =	3.0994e-05
Gr # 12:	R=	0.83975	f(x)=	3.9876e-13	x(1)=	-2.8051	x(2)=	3.1313	step=	0.015625	crate=	0.2586	gradf =	8.015e-06
Gr # 13:	R=	0.83975	f(x)=	2.6665e-14	x(1)=	-2.8051	x(2)=	3.1313	step=	0.015625	crate=	0.25859	gradf =	2.0726e-06
Gr # 14:	R=	0.83975	f(x)=	1.7831e-15	x(1)=	-2.8051	x(2)=	3.1313	step=	0.015625	crate=	0.25859	gradf =	5.3597e-07

Mk function: @(x)hessf(x0)

Hessian approximation at last iterate (rank = 2, condition = 1.135021e+00, eigenvalues = (-21.0096, -18.5104)):

-20.72	-0.8
-0.8	-18.8

Hessian (exact) at last iterate (rank = 2, condition = 1.242283e+00, eigenvalues = (64.8404, 80.5501)):

64.949499843183	1.30477775393258
1.30477775393258	80.4409451961506

x0 = [-1.20 ; 1.00]
x = [-2.80511809 ; 3.13131252]
f(x) = 1.7831499e-15
#it = 14 #f = 125 #gradf = 15 #hessf = 14