Table 1: Performance Results for Himmelblau_2D Problem

Optimizer	Mean Final Value	Std Dev	Best Value	Worst Value	Mean Func Evals	Success Rate (%)	Mean Time (s)
L-BFGS-MoreThuente	1.02e-1	7.28e-2	8.92e-3	2.39e-1	36.3	100.0	0.000
GD	1.53e-1	6.88e-2	2.80e-2	2.41e-1	42.9	100.0	0.001
QQN-Bisection-2	8.17e-2	6.08e-2	2.27e-3	2.05e-1	55.1	100.0	0.001
L-BFGS-Limited	9.58e-2	8.02e-2	7.81e-3	2.40e-1	60.9	100.0	0.001
QQN-StrongWolfe	9.18e-2	6.79e-2	9.60e-3	2.15e-1	61.5	100.0	0.001
QQN-CubicQuadraticInterpolation	9.46e-2	7.76e-2	5.19e-3	2.45e-1	68.0	100.0	0.002
QQN-GoldenSection	7.91e-2	6.51e-2	1.17e-4	2.36e-1	102.8	100.0	0.001
QQN-Bisection-1	1.09e-1	4.94e-2	2.06e-2	2.13e-1	107.9	100.0	0.002
L-BFGS-Conservative	2.03e-1	2.91e-2	1.42e-1	2.47e-1	264.2	100.0	0.006
Adam-WeightDecay	2.41e-1	4.02e-3	2.34e-1	2.48e-1	1744.1	100.0	0.037
Trust Region-Adaptive	1.32e-1	5.93e-2	7.13e-2	2.46e-1	2048.1	100.0	0.013
Trust Region-Standard	1.50e-1	8.67e-2	3.76e-3	3.03e-1	516.7	80.0	0.003
GD-WeightDecay	3.93e-1	4.16e-1	8.90e-2	1.20e0	29.6	75.0	0.001
GD-Nesterov	9.49e0	7.94e0	3.27e-2	2.11e1	26.7	40.0	0.001
L-BFGS	6.22e0	5.64e0	1.56e-2	1.80e1	93.7	35.0	0.001
Trust Region-Aggressive	6.71e-1	4.77e-1	1.80e-2	1.52e0	133.1	25.0	0.001
GD-Momentum	4.37e1	1.60e1	3.43e0	7.63e1	24.3	0.0	0.001
L-BFGS-Aggressive	3.44e1	1.81e1	4.95e0	7.59e1	3850.9	0.0	0.022
Adam-Fast	5.29e0	2.08e-1	4.98e0	5.82e0	69.3	0.0	0.001
GD-AdaptiveMomentum	6.94e1	3.44e0	5.87e1	7.33e1	22.8	0.0	0.001
Adam-AMSGrad	8.17e1	5.99e0	7.19e1	9.17e1	2502.0	0.0	0.055
Adam	8.20e1	5.99e0	7.20e1	9.40e1	2502.0	0.0	0.048
Adam-Robust	1.05e2	5.73e0	9.10e1	1.15e2	2502.0	0.0	0.055
Trust Region-Precise	1.07e2	3.03e0	1.02e2	1.12e2	3002.0	0.0	0.018
Trust Region-Conservative	1.60e2	3.17e0	1.52e2	1.65e2	3002.0	0.0	0.018