Numerical optimization with Python – programming assignment 1
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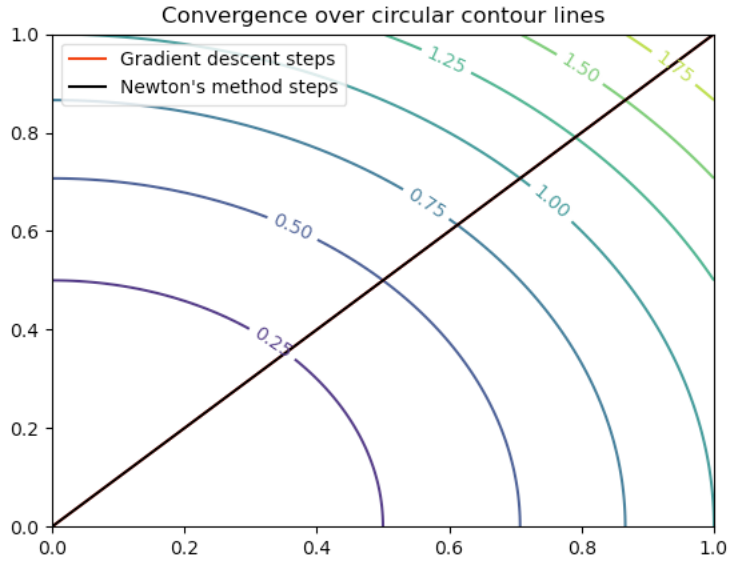
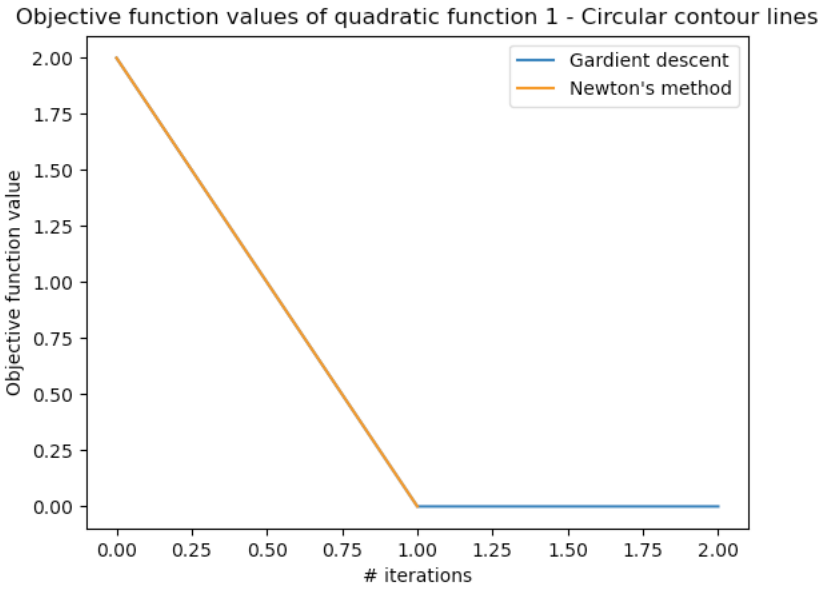
Quadratic function 1 - Circle contour lines:

point of convergence - newton: [0. 0.], value: 0.0, success: True
point of convergence - GD: [0. 0.], value: 0.0, success: True

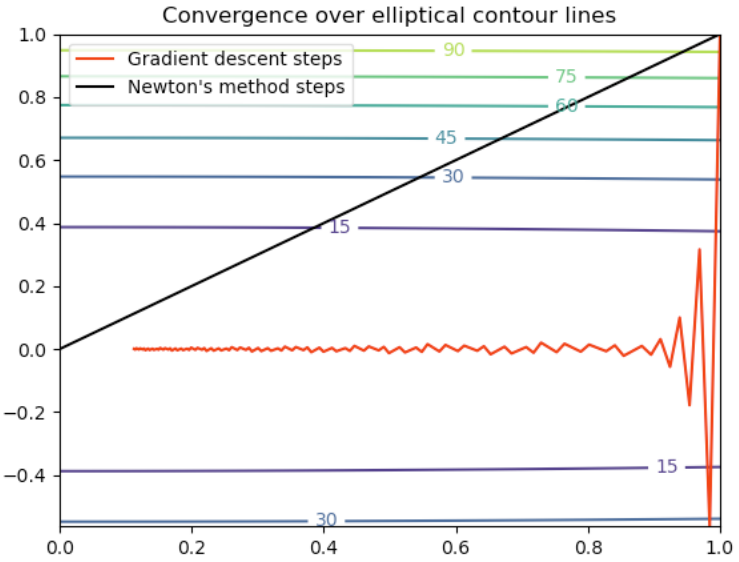


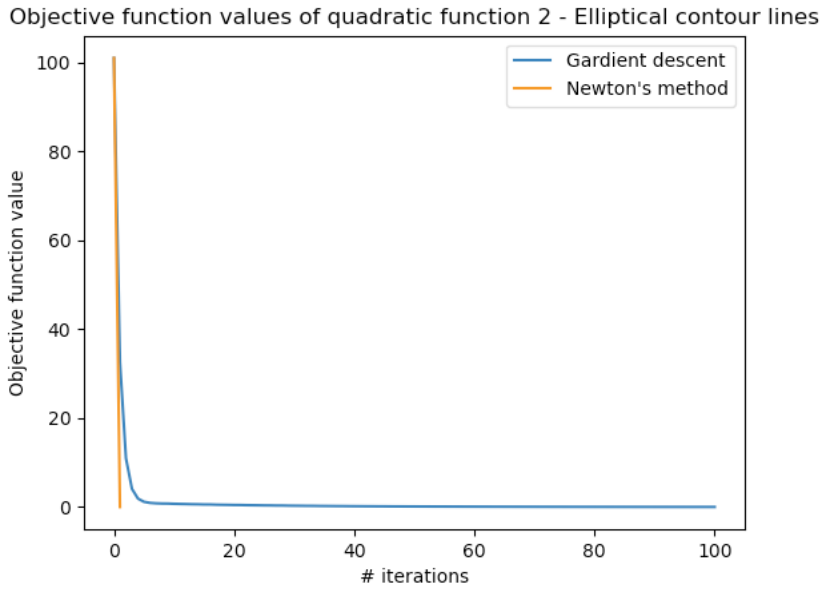


Quadratic function 2 – Elliptical contour lines:

point of convergence - newton: [0. 0.], value: 0.0, success: True

point of convergence - GD: [0.11271997 0.0008856], value: 0.012784220095399295, success: False

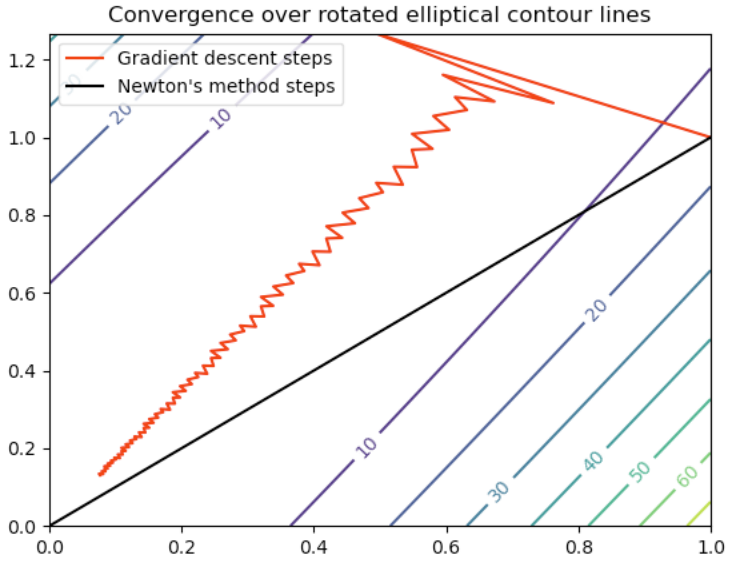


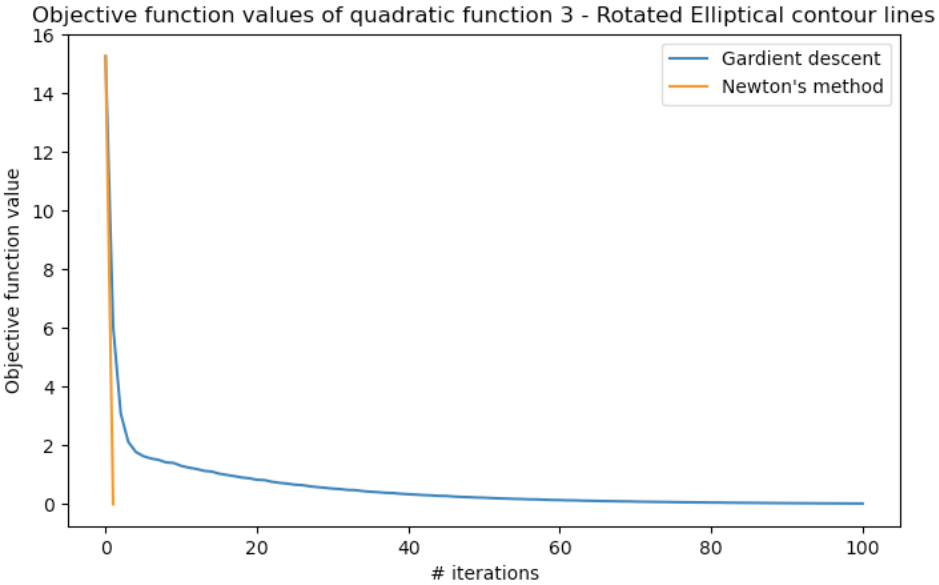


Quadratic function 3 – Rotated elliptical contours:

point of convergence - newton: [-6.66133815e-16 -8.88178420e-16], value: 2.9785327031956913e-30, success: True

point of convergence - GD: [0.07682763 0.13062022], value: 0.02311258419270041, success: False

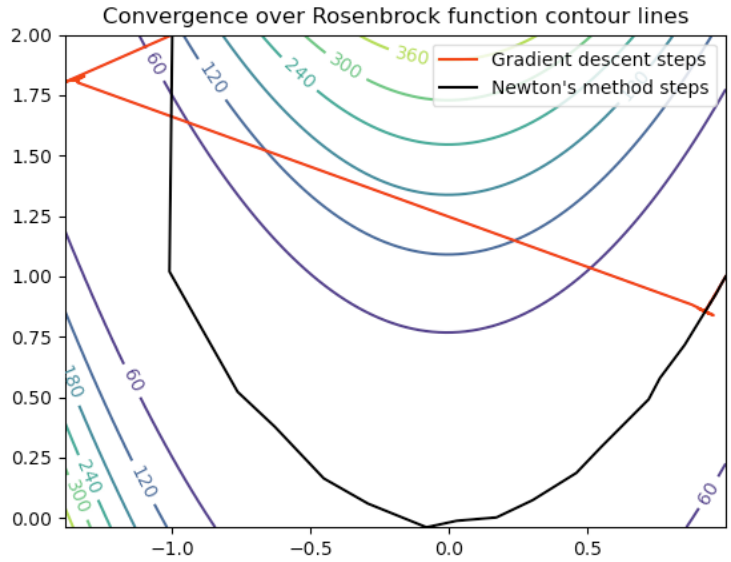


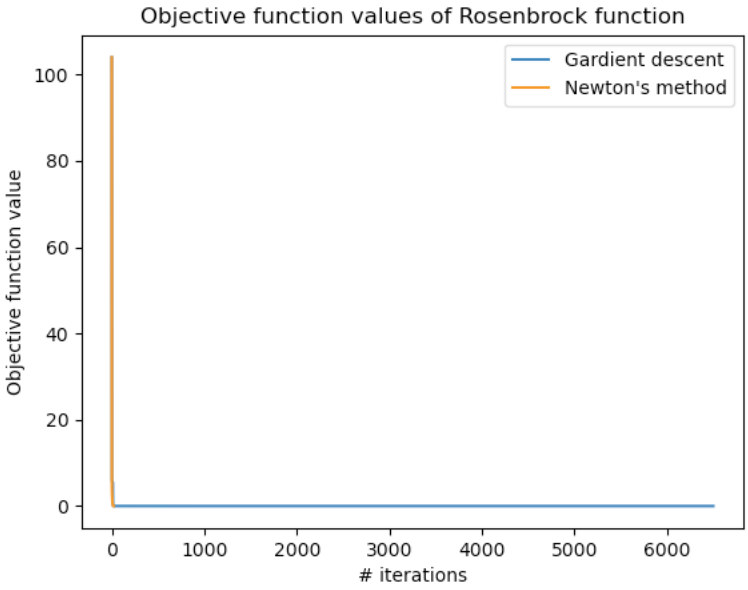


Rosenbrock function:

point of convergence - newton: [0.99999999 0.99999998], value: 2.7300933598972337e-16, success: True

point of convergence - GD: [0.99970701 0.99941465], value: 8.587653457911118e-08, success: True

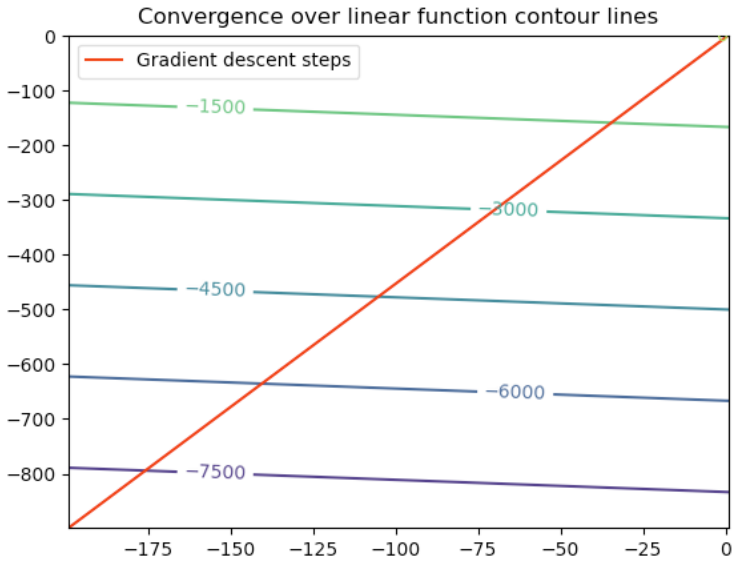


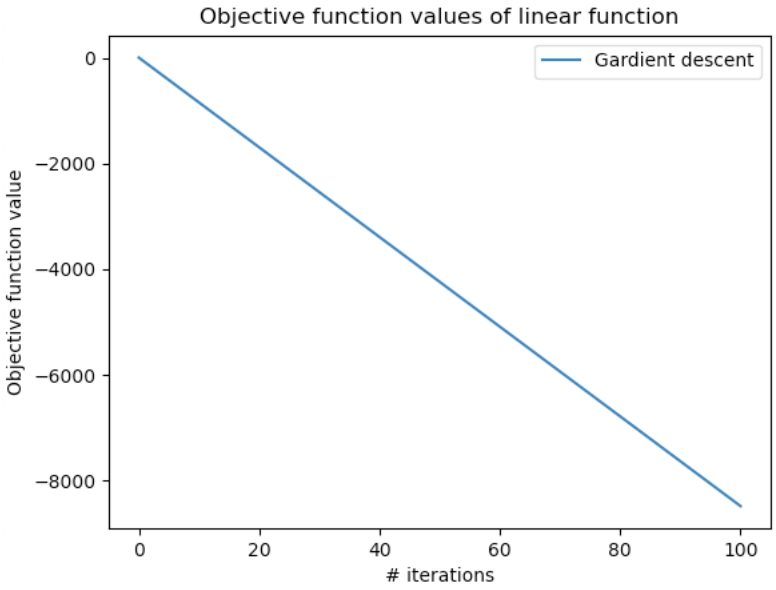


Linear function:

point of convergence - GD: [-199 -899], value: -8489, success: False

This function cannot converge since its strictly monotonic,
Moreover, Newton's method is invalid here since the Hessian is 0.





Smoothed corner triangles function:

point of convergence - newton: [-3.46573016e-01 -3.46939879e-18], value: 2.5592666966586375, success: True

point of convergence - GD: [-3.46571692e-01 -2.84037017e-06], value: 2.559266696709286, success: True