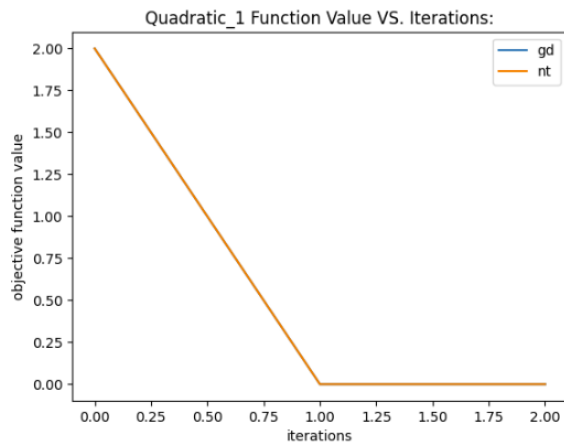


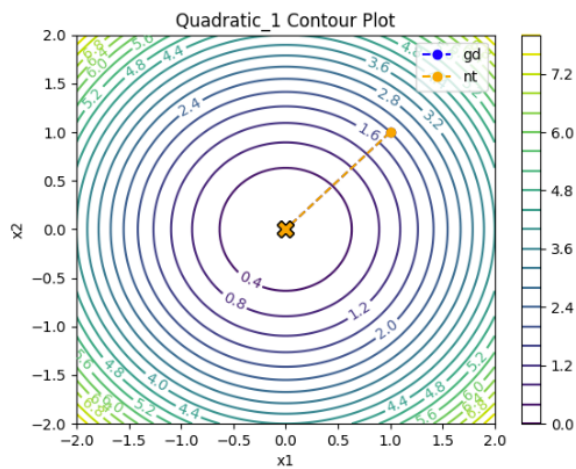
## HW1 – unconstrained minimization programming – Oren Ben Eliyahu 204079453

### Quadratic 1:

- **Function value vs. iteration plot:**



- **Contours with iteration paths:**



- **GD final iteration report:**

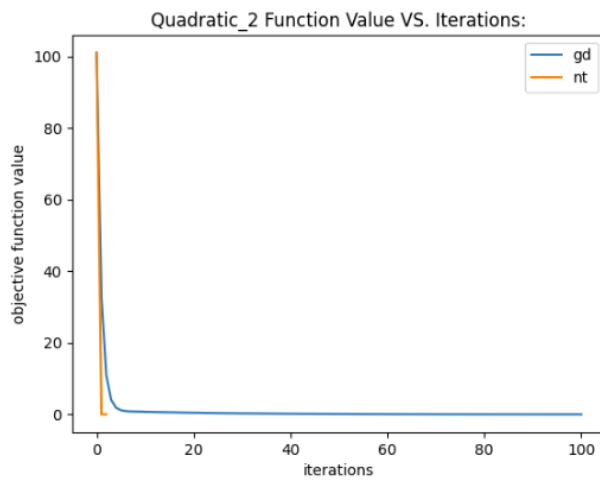
i=2, x=[0. 0.], f(x2)=0.0 Succes: True

- **NT final iteration report:**

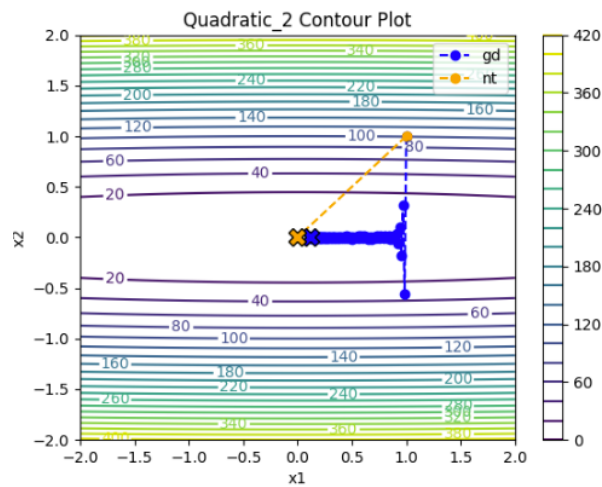
i=2, x=[0. 0.], f(x2)=0.0 Succes: True

## Quadratic 2:

- **Function value vs. iteration plot:**



- **Contours with iteration paths:**



- **GD final iteration report:**

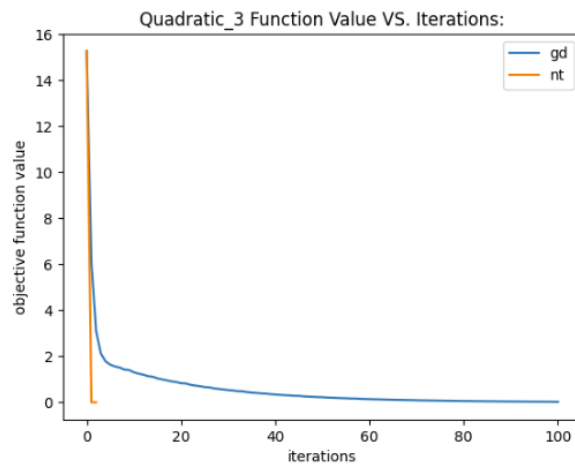
i=100, x=[0.11271997 0.0008856 ], f(x100)=0.012784220095399295 Succes: False

- **NT final iteration report:**

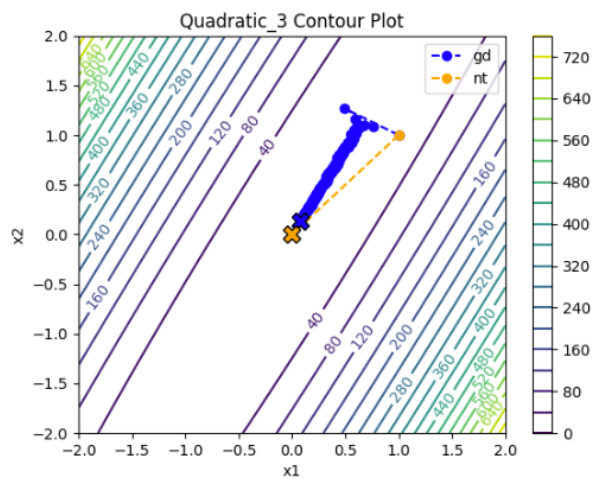
i=2, x=[0. 0.], f(x2)=0.0 Succes: True

### Quadratic 3:

- **Function value vs. iteration plot:**



- **Contours with iteration paths:**



- **GD final iteration report:**

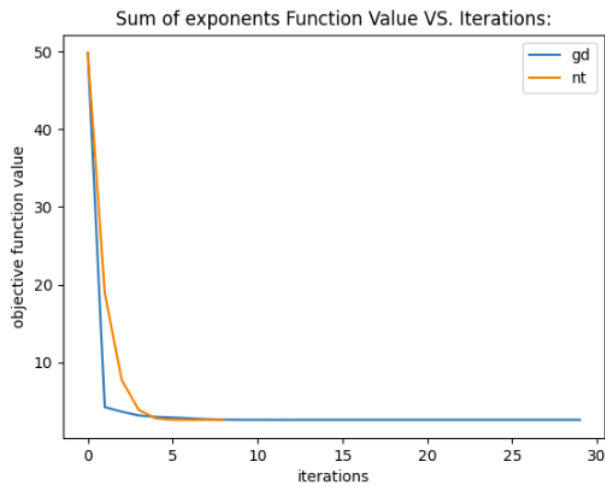
i=100, x=[0.07682763 0.13062022], f(x100)=0.02311258419270041 Succes: False

- **NT final iteration report:**

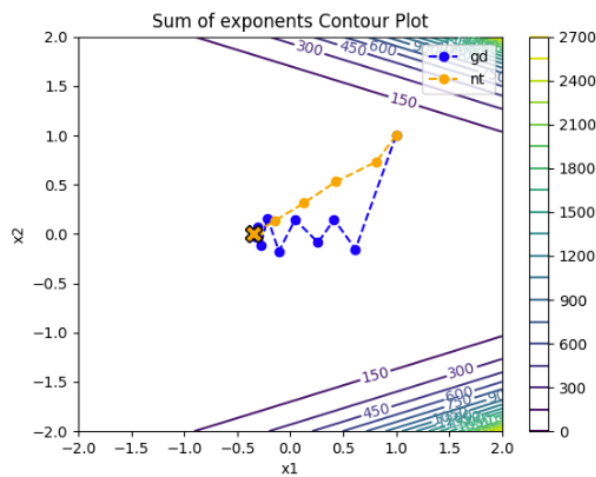
i=2, x=[0. 0.], f(x2)=0.0 Succes: True

## Sum of exponents:

- **Function value vs. iteration plot:**



- **Contours with iteration paths:**



- **GD final iteration report:**

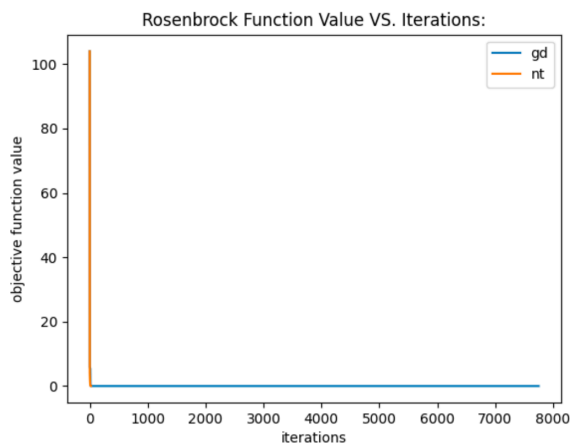
i=29, x=[-3.46572886e-01 -9.76799665e-07], f(x29)=2.559266696664345, Succes: True

- **NT final iteration report:**

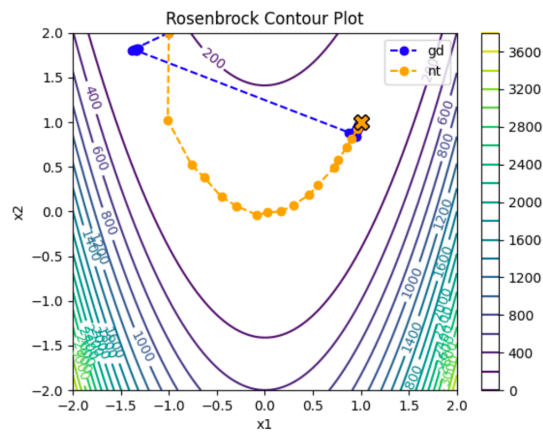
i=8, x=[-3.46573590e-01 6.80690347e-12], f(x8)=2.5592666966582156, Succes: True

## Rosenbrock:

- **Function value vs. iteration plot:**



- **Contours with iteration paths:**



- **GD final iteration report:**

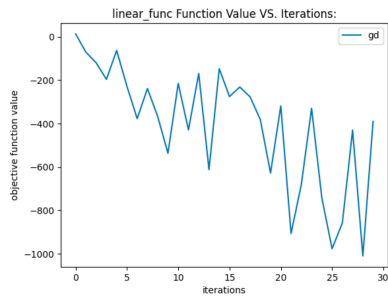
$i=7751$ ,  $x=[0.99989437 \ 0.99978771]$ ,  $f(x_{7751})=1.1267173492101773e-08$ , Succes: True

- **NT final iteration report:**

$i=20$ ,  $x=[0.99999999 \ 0.99999998]$ ,  $f(x_{20})=2.7300933598972337e-16$  Succes: True

## Linear function:

- **Function value vs. iteration plot:**



- **GD final iteration report:**

i=29, x=[-79.71875572 -75.28125668], f(x29)=-389.71878051757903, Success: True