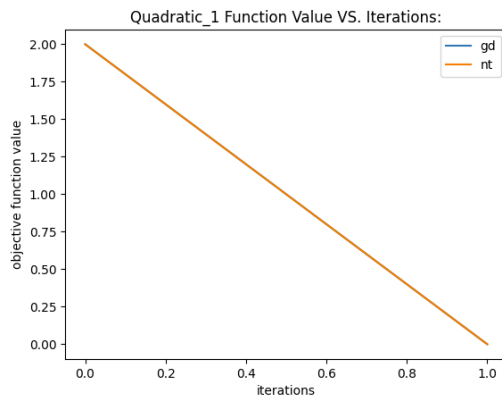


HW 1 Unconstrained minimization Programing Report –

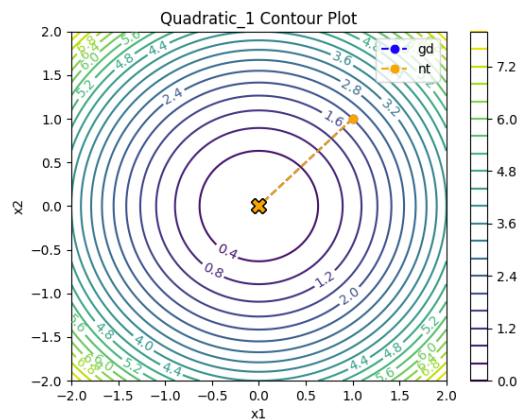
Yuval Barkan

Quadratic 1:

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



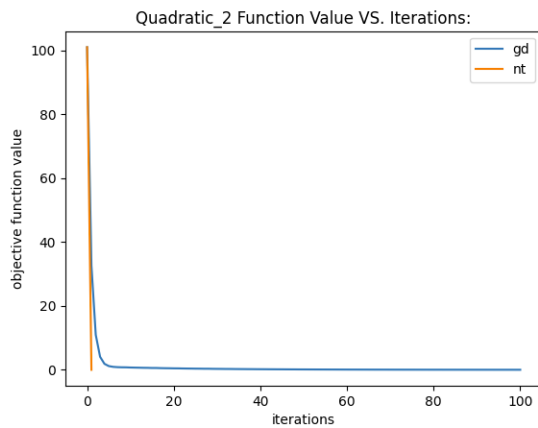
- **Contours with iteration paths:**



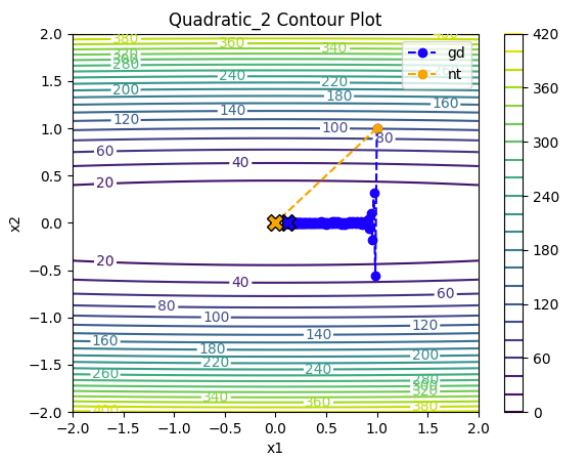
- **GD final iteration report:**
- $i=1$, $x=[0.0]$, $f(x_1)=0.0$, Success: True
- **NT final iteration report:**
- $i=1$, $x=[0.0]$, $f(x_1)=0.0$ Success: True

Quadratic 2:

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



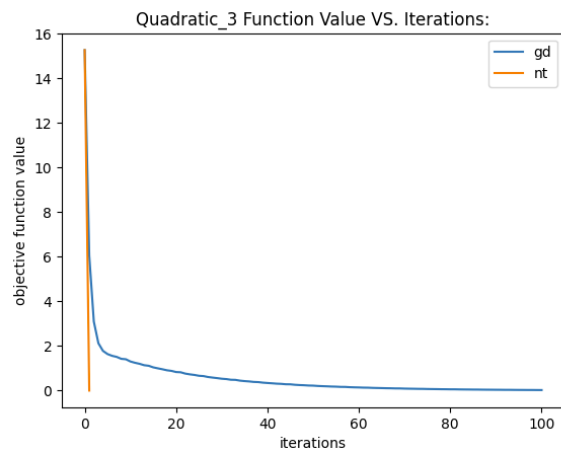
- **Contours with iteration paths:**



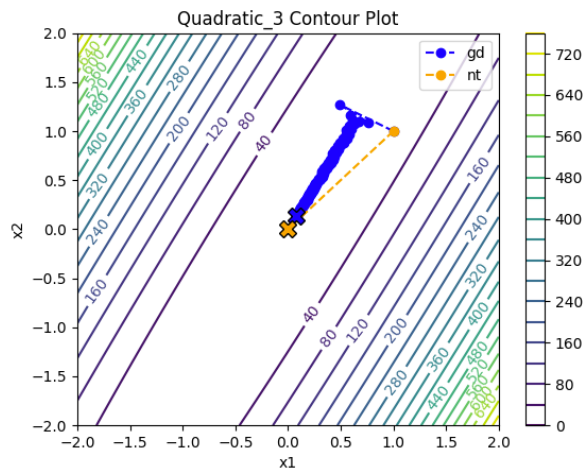
- **GD final iteration report:**
- $i=100$, $x=[0.11271997 \ 0.0008856]$, $f(x_{100})=0.012784220095399295$, Success: False
- **NT final iteration report:**
- $i=1$, $x=[0. \ 0.]$, $f(x_1)=0.0$ Success: True

Quadratic 3:

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



- **Contours with iteration paths:**



- **GD final iteration report:**

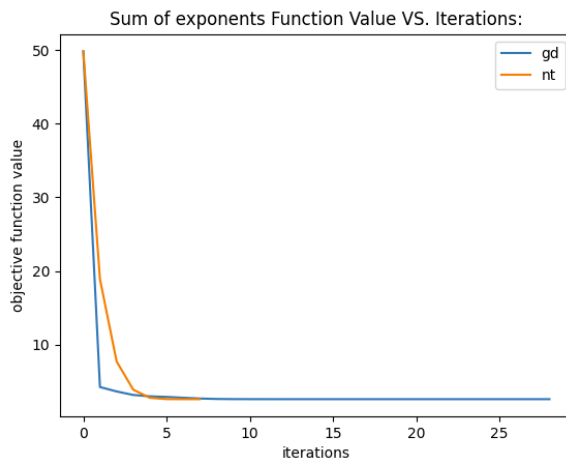
i=100, x=[0.07682763 0.13062022], f(x100)=0.02311258419270041, Success: False

- **NT final iteration report:**

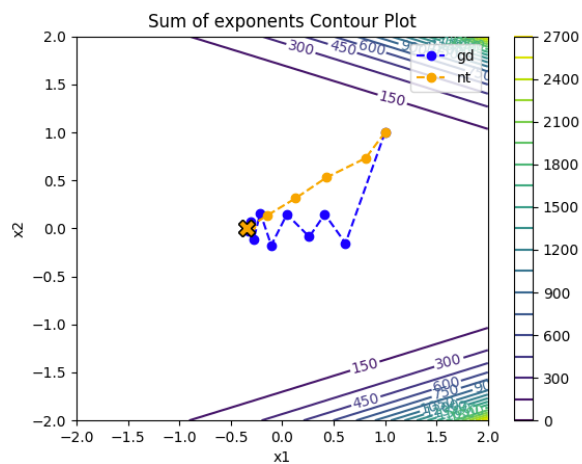
i=1, x=[0. 0.], f(x1)=0.0, Success: True

Sum of exponents:

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



- **Contours with iteration paths:**



- **GD final iteration report:**

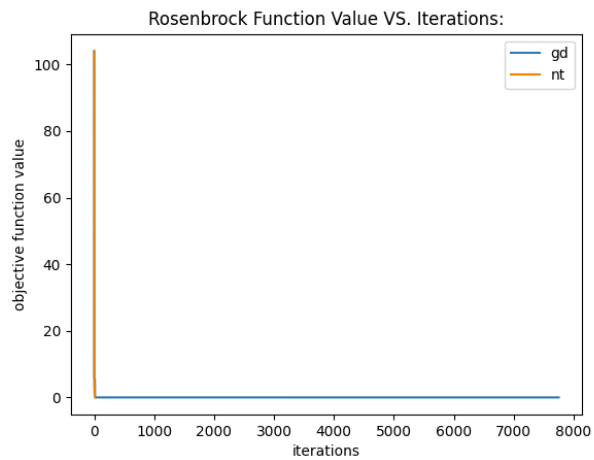
i=28, x=[-3.46571635e-01 5.19800828e-07], f(x28)=2.5592666966646647, Success: True

- **NT final iteration report:**

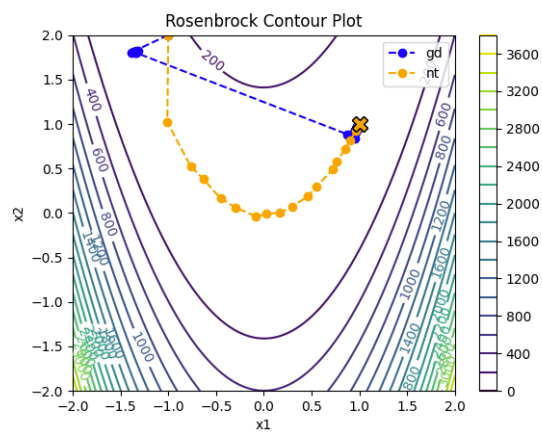
i=7, x=[-3.46570386e-01 2.12417725e-06], f(x7)=2.559266696697338, Success: True

Rosenbrock:

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



- **Contours with iteration paths:**



- **GD final iteration report:**

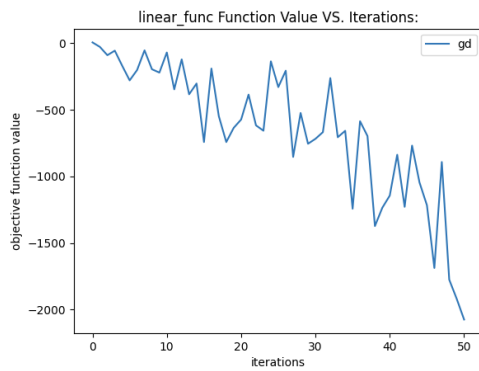
i=7750, x=[0.99989387 0.99978754], f(x7750)=1.1267921607675336e-08, Success: True

- **NT final iteration report:**

i=19, x=[0.9999622 0.99992331], f(x19)=1.5495537433920102e-09, Success: True

Linear function:

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



- **GD final iteration report:**

$i=50$, $x=[-155.11059761 \ -143.08764839]$, $f(x_{50})=-2075.364772796631$, Success: True