HW 1 Unconstrained minimization Programing Report –

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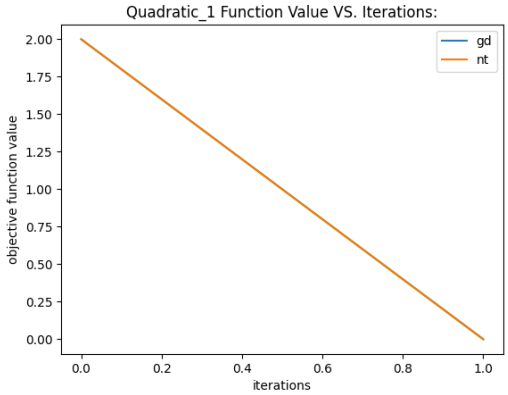
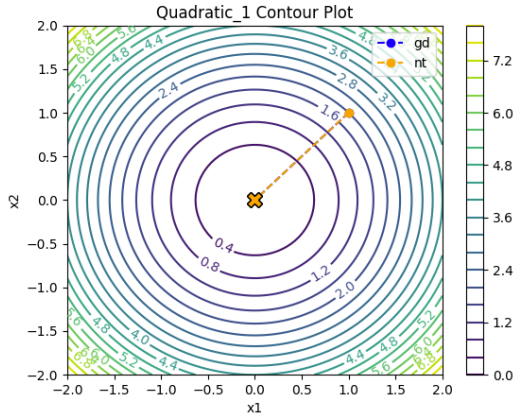
Quadratic 1:

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



- **Contours with iteration paths:**

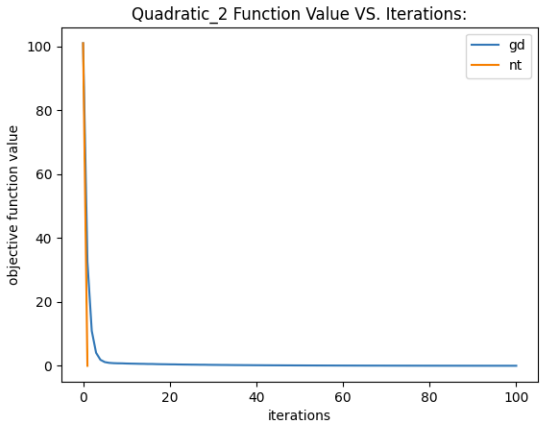


- **GD final iteration report:**
- i=1, x=[0. 0.], f(x1)=0.0, Success: True
- **NT final iteration report:**

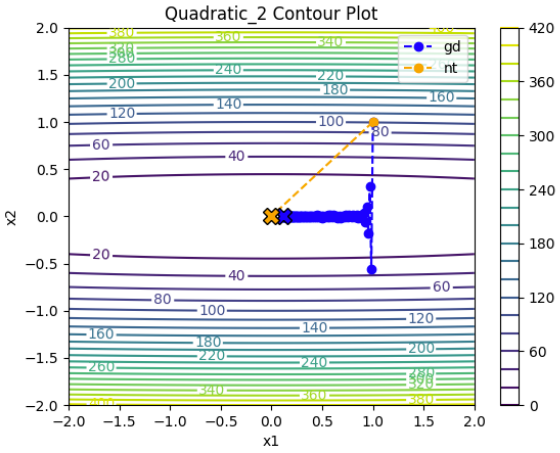
  i=1, x=[0. 0.], f(x1)=0.0 Succes: True

Quadratic 2:

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



- **Contours with iteration paths:**

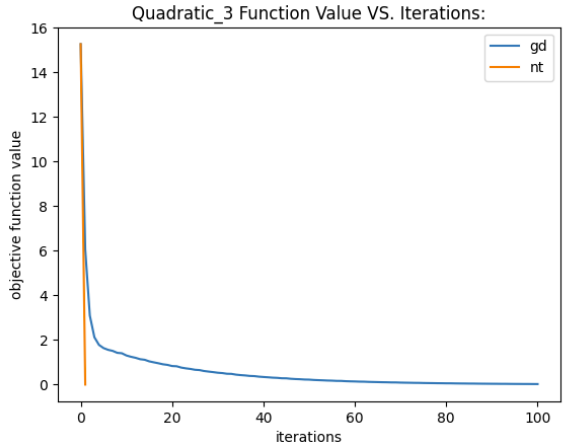


- **GD final iteration report:**
- i=100, x=[0.11271997 0.0008856], f(x100)=0.012784220095399295, Success: False
- **NT final iteration report:**

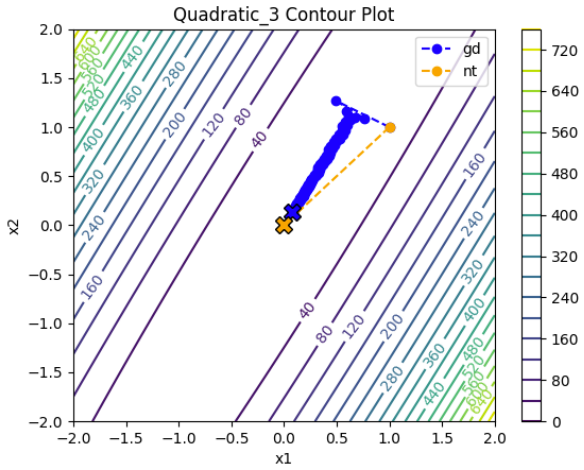
  i=1, x=[0. 0.], f(x1)=0.0 Succes: True

<u>Quadratic 3:</u>

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



- **Contours with iteration paths:**



- **GD final iteration report:**

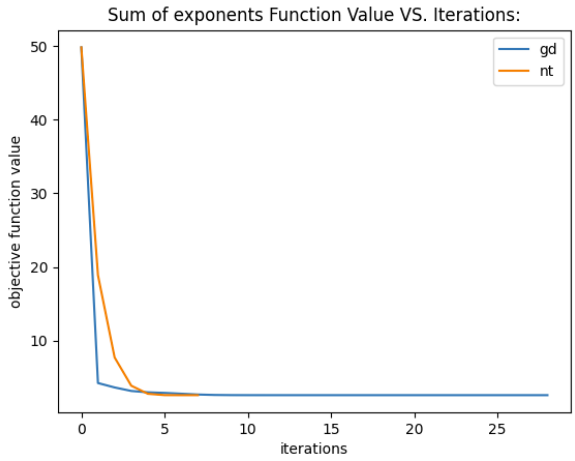
  i=100, x=[0.07682763 0.13062022], f(x100)=0.02311258419270041, Success: False

- **NT final iteration report:**

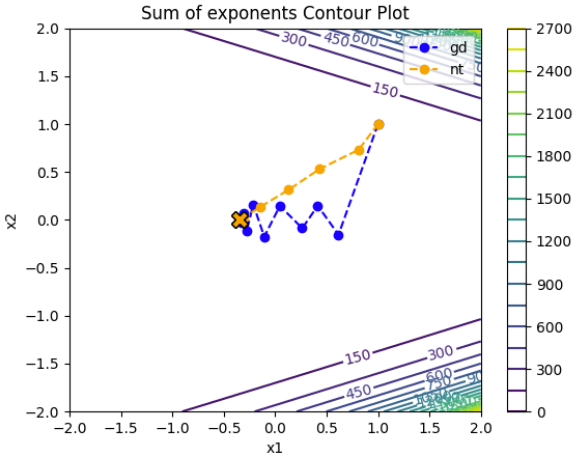
  i=1, x=[0. 0.], f(x1)=0.0, Succes: True

<u>Sum of exponents:</u>

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



- **Contours with iteration paths:**



- **GD final iteration report:**

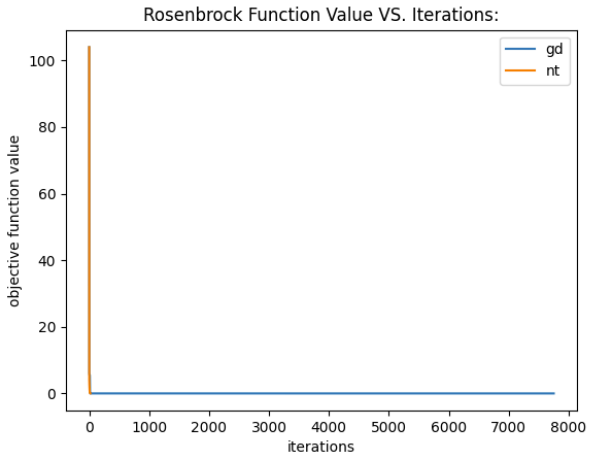
  i=28, x=[-3.46571635e-01 5.19800828e-07], f(x28)=2.5592666966646647, Success: True

- **NT final iteration report:**

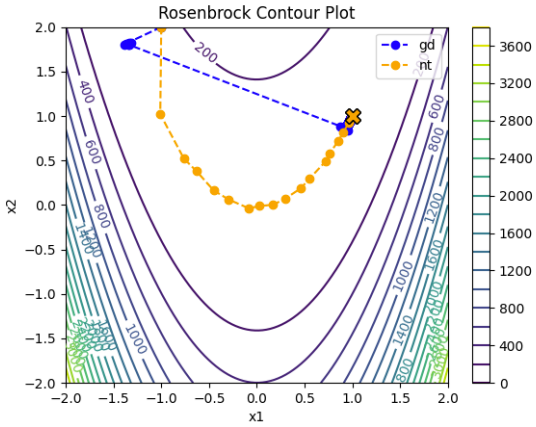
  i=7, x=[-3.46570386e-01 2.12417725e-06], f(x7)=2.559266696697338, Success: True

Rosenbrock:

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



- **Contours with iteration paths:**



- **GD final iteration report:**

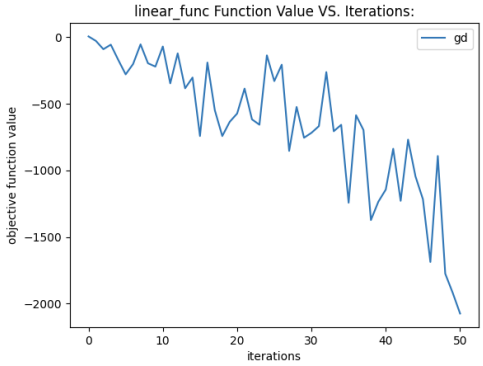
  i=7750, x=[0.99989387 0.99978754], f(x7750)=1.1267921607675336e-08, Success: True

- **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(x50)=-2075.364772796631, Success: True