**HW 1 Unconstrained minimization Programing Report –**

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**Quadratic 1:**

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

**Chart, line chart

Description automatically generated**

* **Contours with iteration paths:**

**Chart

Description automatically generated**

* **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:**

**Chart

Description automatically generated**

* **Contours with iteration paths:**

**Chart

Description automatically generated**

* **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

**Quadratic 3:**

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

**Chart

Description automatically generated**

* **Contours with iteration paths:**

**Diagram

Description automatically generated**

* **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

**Sum of exponents:**

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

**Chart

Description automatically generated**

* **Contours with iteration paths:**

**Chart

Description automatically generated**

* **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:**

Graphical user interface

Description automatically generated with low confidence

* **Contours with iteration paths:**

Diagram, histogram

Description automatically generated

* **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:**

**Chart

Description automatically generated**

* **GD final iteration report:**

i=50, x=[-155.11059761 -143.08764839], f(x50)=-2075.364772796631, Success: True