HW8

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All results can be reproduced by running HW8.m. I commented out the lines that generate plots.

1 Problem 1

1.1 Part i

Using the gradient descent method with golden section search gave me an optimal solution of $\mathbf{x} = \begin{pmatrix} -2.1418 \\ 2.8582 \end{pmatrix}$ and an optimal value of -4.1423.

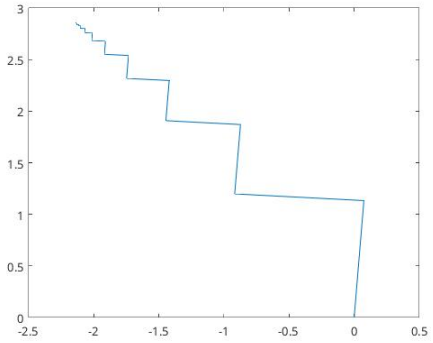

Figure 1: Gradient Descent with Golden Search Solution Path

1.2 Part ii

Using the gradient descent method with backtracking line search gave me an optimal solution of $\mathbf{x} = \begin{pmatrix} -2.1418 \\ 2.8582 \end{pmatrix}$ and an optimal value of -4.1423.

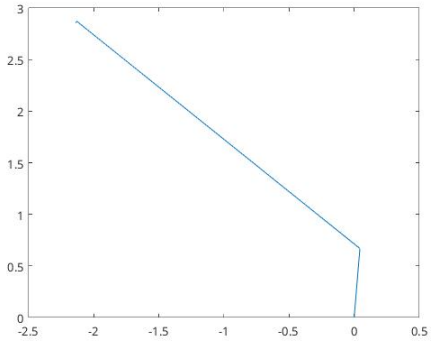

Figure 2: Gradient Descent with Backtracking Line Search Solution Path

2 Problem 2

Using Newton's method gave me an optimal solution of $\mathbf{x} = \begin{pmatrix} -2.1418 \\ 2.8582 \end{pmatrix}$ and an optimal value of -4.1423.

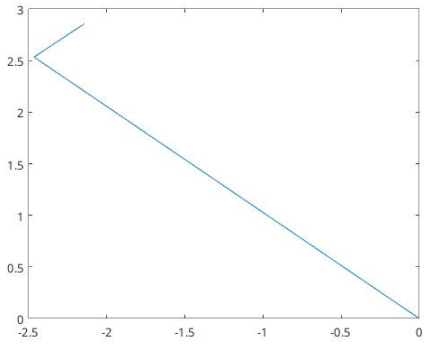

Figure 3: Newton's Method Solution Path

3 Problem 3

Using both the gradient projection method and CVX gave me an optimal solution of $\mathbf{x} = \begin{pmatrix} -.5183 \\ 1.2500 \\ .6728 \end{pmatrix}$ and an optimal value of -2.2524.