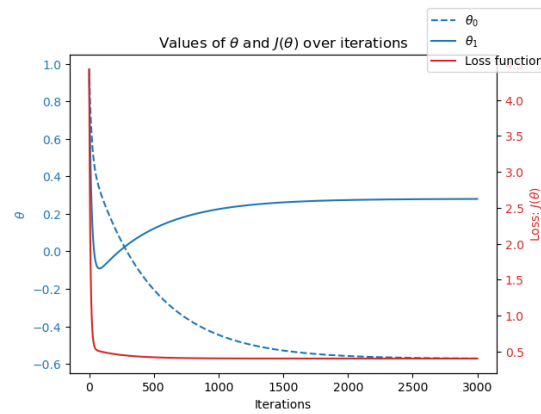*Luis Gil*

Summary:

- **Iterations (num_iterations):** 3000 seems sufficient for decent convergence.

- **Learning Rate (alpha):** 0.01 is a good balance, providing a reasonable speed of convergence.

- **Initial Thetas:** The initial guesses of $\theta_0=1$ and $\theta_1=1$ are working fine, and the final values after optimization are around $\theta_0=-0.57$ and $\theta_1=0.28$.
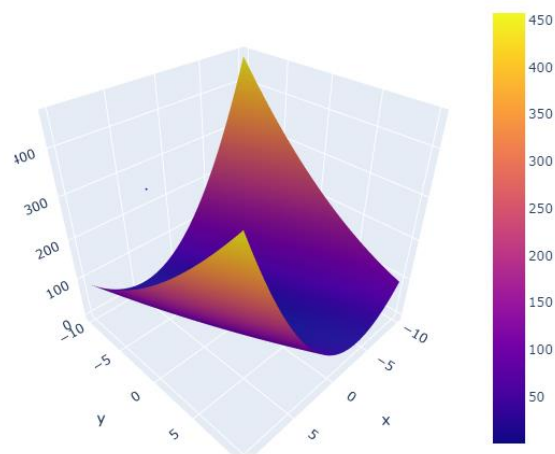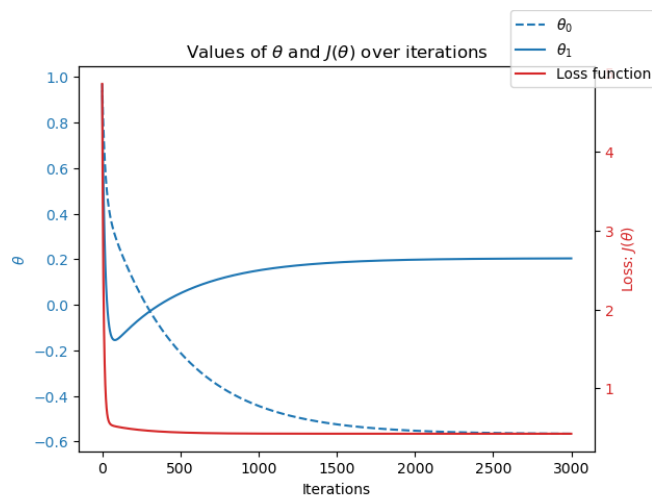
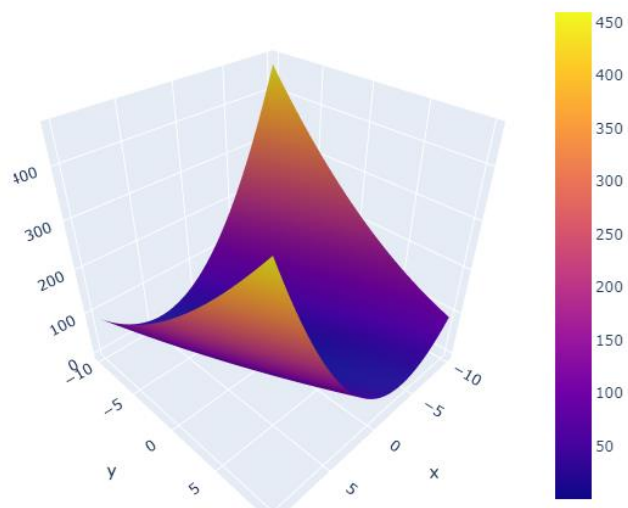# Budapest 1960

Loss Function

Loss Profile

Luis Gil

Budapest 1980

Loss Function

Loss Profile

Budapest 2000

Loss Function
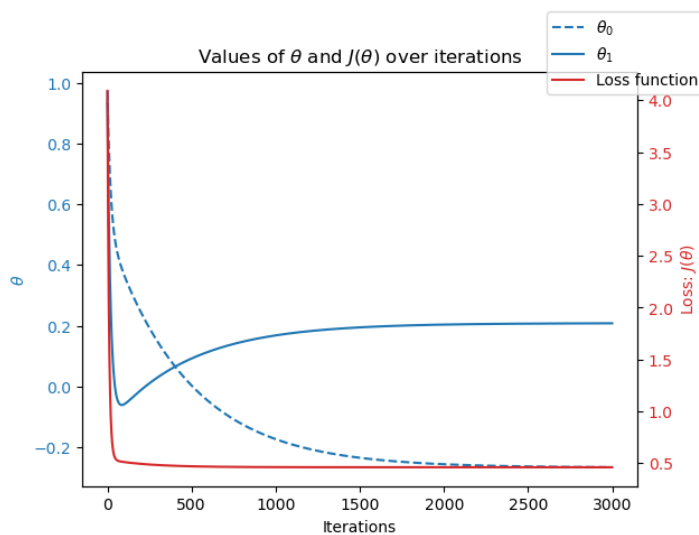
Loss Profile

Loss function for different thetas

Basel 1960

Loss Function

Loss Profile
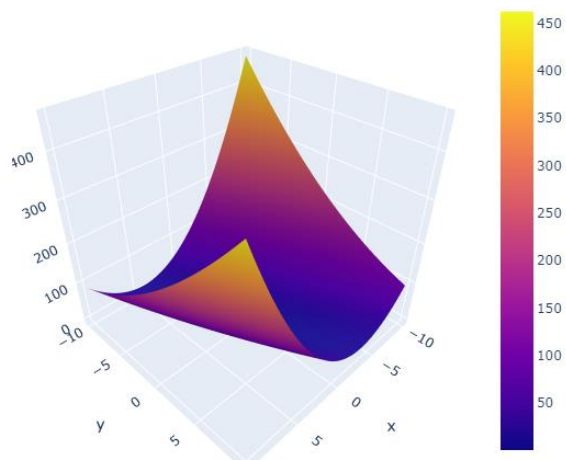
Basel 1980

Loss Function

Loss Profile

Loss function for different thetas

Luis Gil
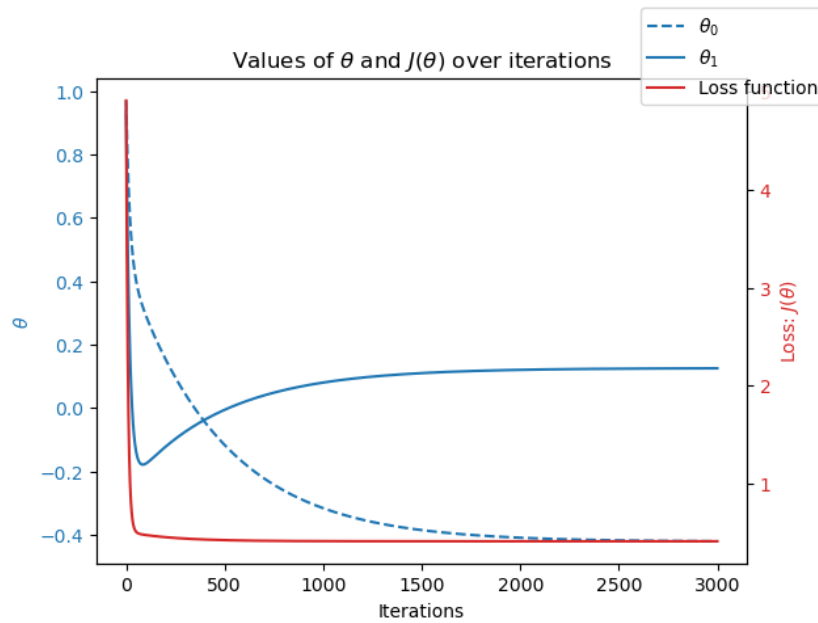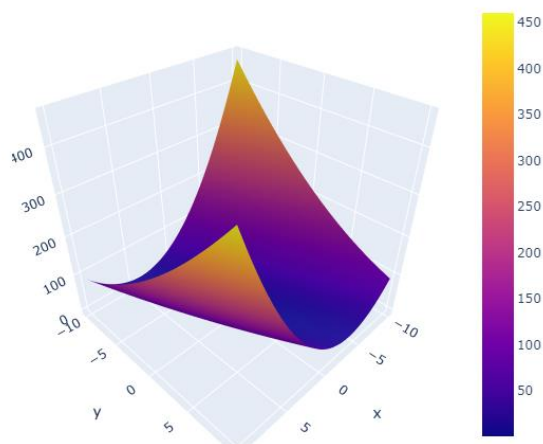
Basel 2000
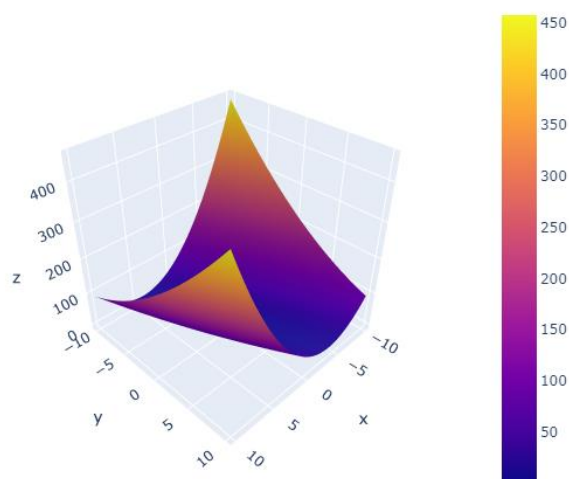
Loss Function

Loss Profile

Loss function for different thetas
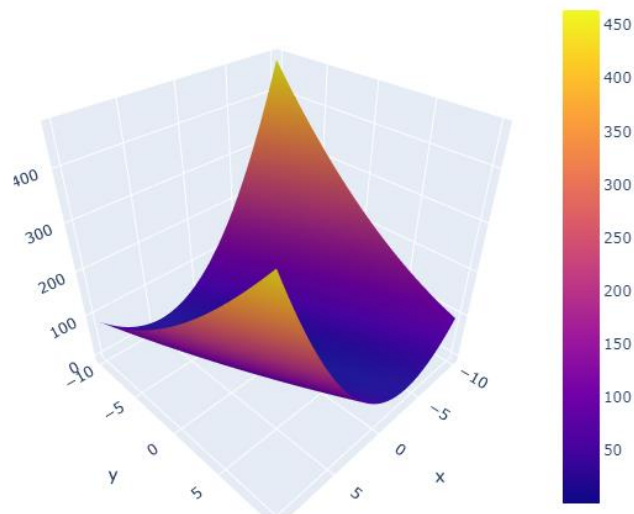
Luis Gil

Belgrade 1960

Loss Function
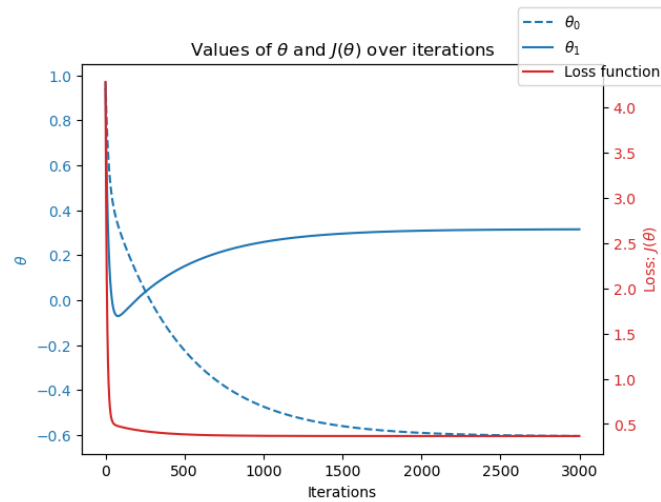
Loss Profile

Loss function for different thetas

Luis Gil

Belgrade 1980

Loss Function
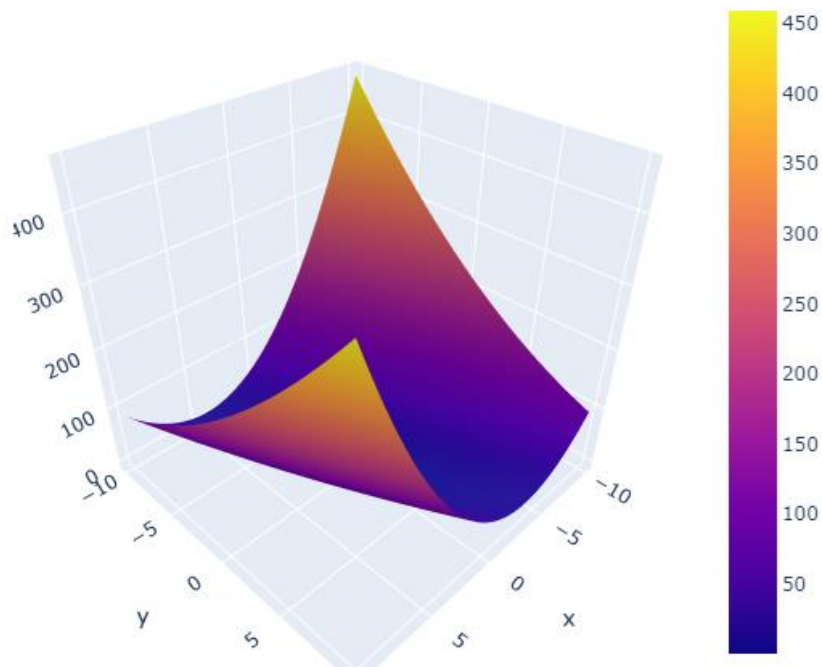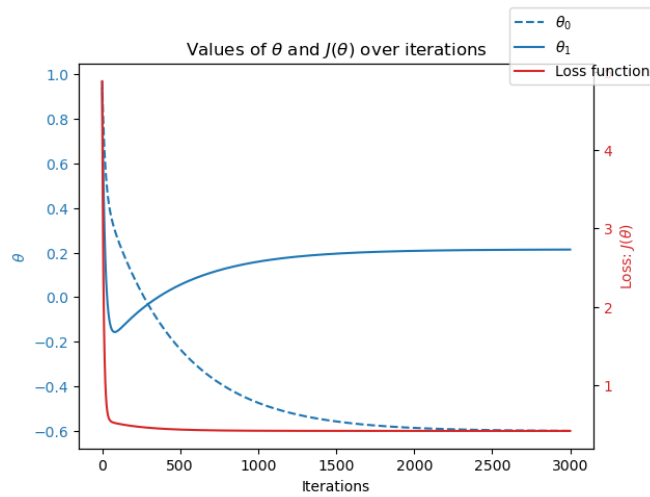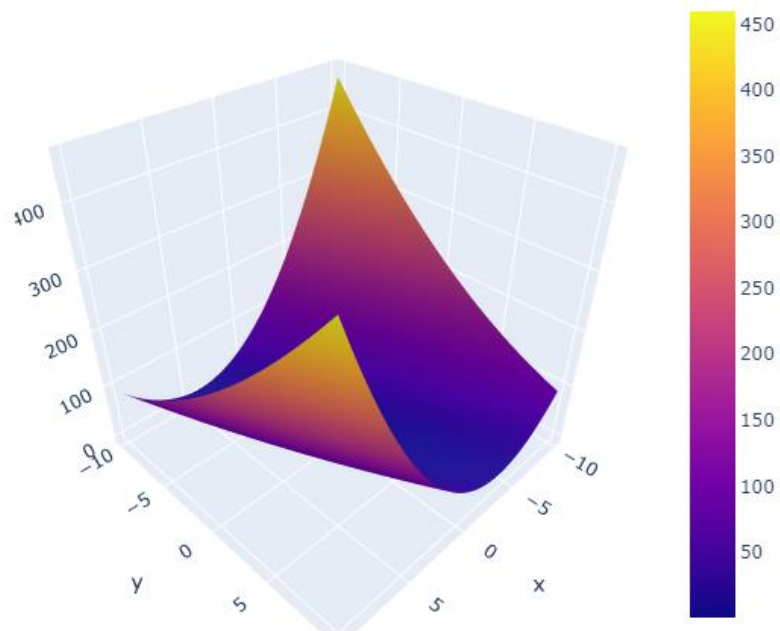

Loss Profile

Loss function for different thetas

Luis Gil

Belgrade 2000

Loss Function

Loss Profile

Loss function for different thetas
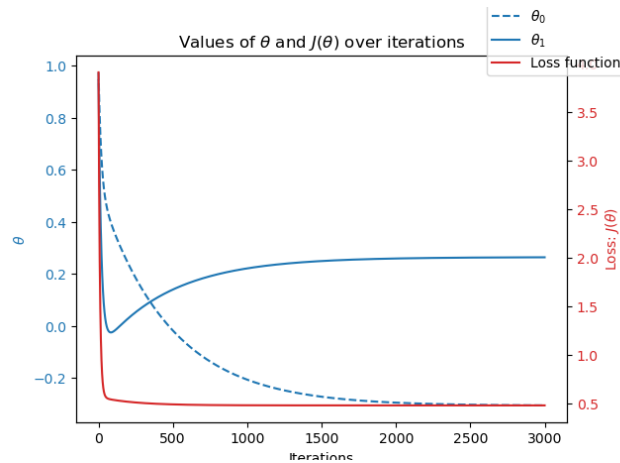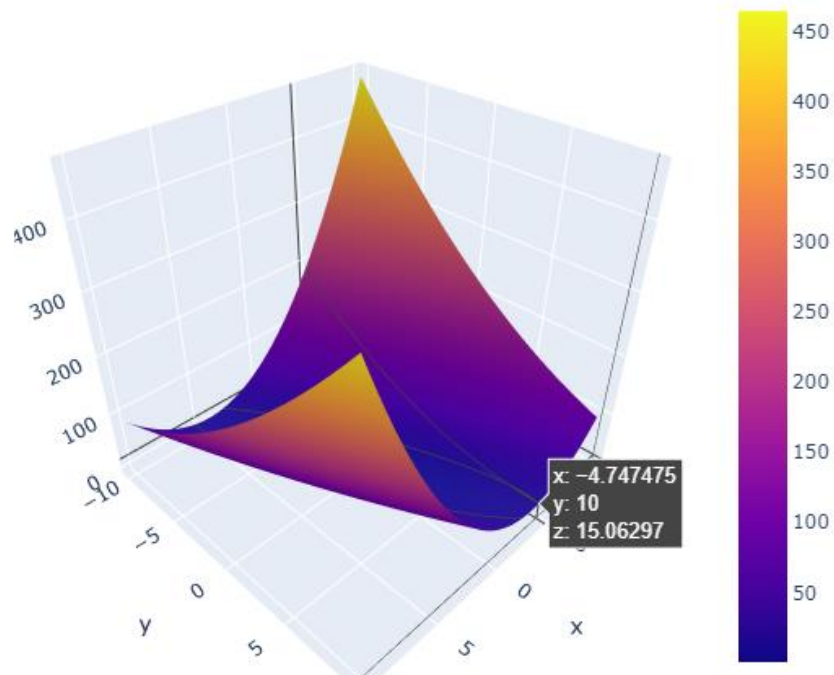
Luis Gil

Observations:

1. General Seasonal Pattern in Temperatures:

Across the weather stations, the temperature data follows a clear seasonal pattern with significant fluctuations throughout the year. The temperatures tend to peak in mid-year (around the summer months) and drop towards the end of the year (during winter). This cyclical trend indicates the influence of the changing seasons on temperature variations, which remains consistent over the years.

2. Steady Temperature Variation Over Time:

Over the course of 60 years, there is no drastic change in the overall temperature profile for most weather stations. The seasonal patterns repeat in a stable manner, suggesting that the average temperature fluctuations between seasons remain relatively constant over time. However, the data does not seem to indicate any immediate evidence of long-term warming or cooling trends at these specific stations.

3. Potential Anomalies in Specific Years or Weather Stations:

While most weather stations exhibit regular temperature fluctuations, there may be occasional outlier years or weather stations with abnormal temperature patterns. These could reflect local climatic events such as heatwaves or unusual cold spells that disrupt the regular seasonal pattern. These anomalies could be important to investigate further for understanding extreme weather events or localized climate changes.