1.3: Exercise 1.3 Optimization in Relation to Problem-Solving

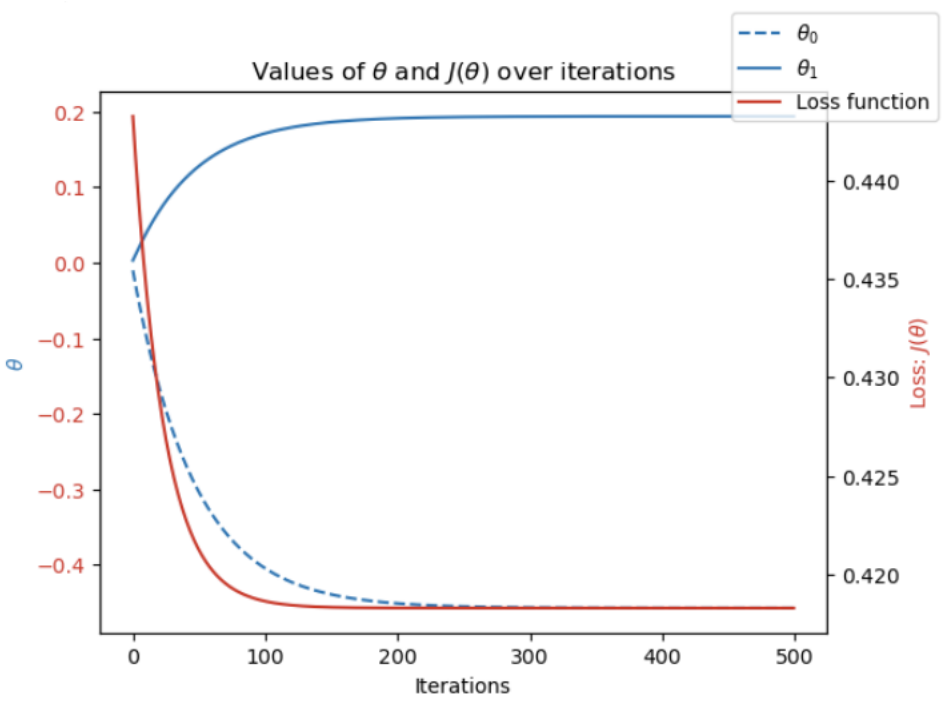
By Daniel Mueller

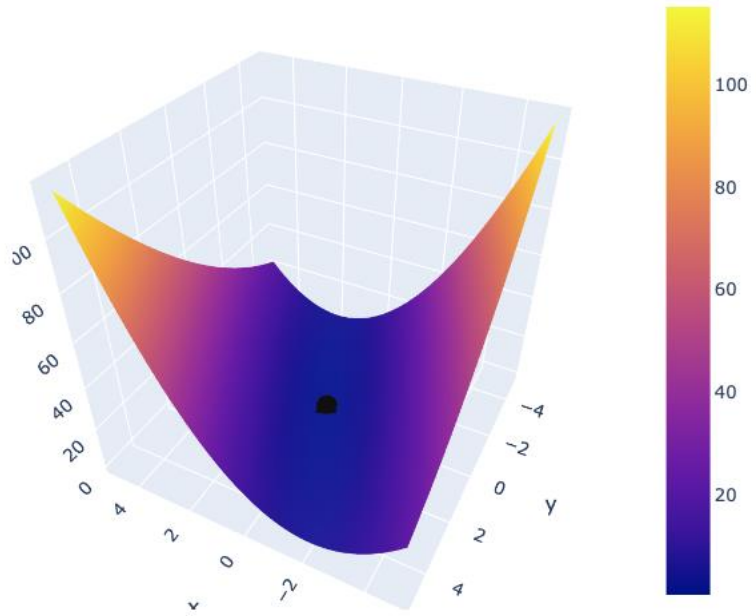
Weather Station	Year	Thetha0	Theta1	Iteration	Step Size
Munich	1960	-0.05	-0.05	500	0.1
Munich	1990	-0.05	-0.05	500	0.1
Munich	2020	-0.05	-0.05	500	0.1
Madrid	1960	-0.05	-0.05	500	0.1
Madrid	1990	-0.05	-0.05	500	0.1
Madrid	2020	-0.05	-0.05	500	0.1
Heathrow	1960	-0.05	-0.05	500	0.1
Heathrow	1990	-0.05	-0.05	500	0.1
Heathrow	2020	-0.05	-0.05	500	0.1

Observations: Please find the visualizations within the notebook.

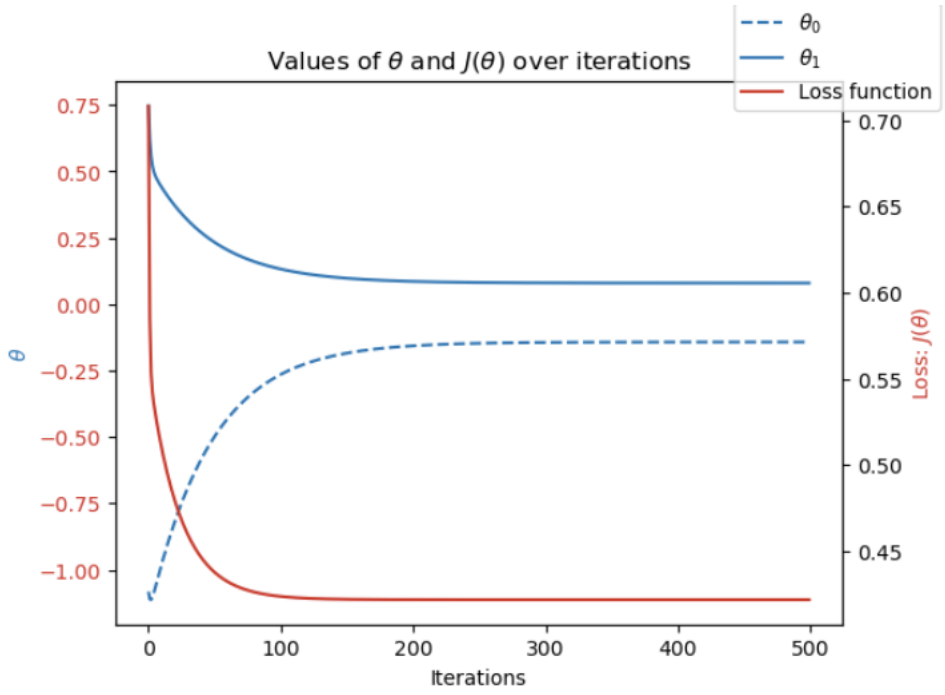
- 1. Scatterplot: The temperature across all weather stations increased in the past 60 years. Interessting to observe is that the maximum temperature increase is lower compared the to decrease of the minimum temperature. Munich accounts the lowest temperature of the three weather stations.
- 2. Histogram: The count of certain temperature is the most balanced in Madrid in a range between **5°C - 25°C** and shows the highest temperature of **(33°C)** and in Munich I can find the widest spectrum of different temperatures **-20°C - 29°C**
- 3. Line Chart: Munich has the biggest increase in average temperature over the past 60 years.

Weather Station Munich in 1960

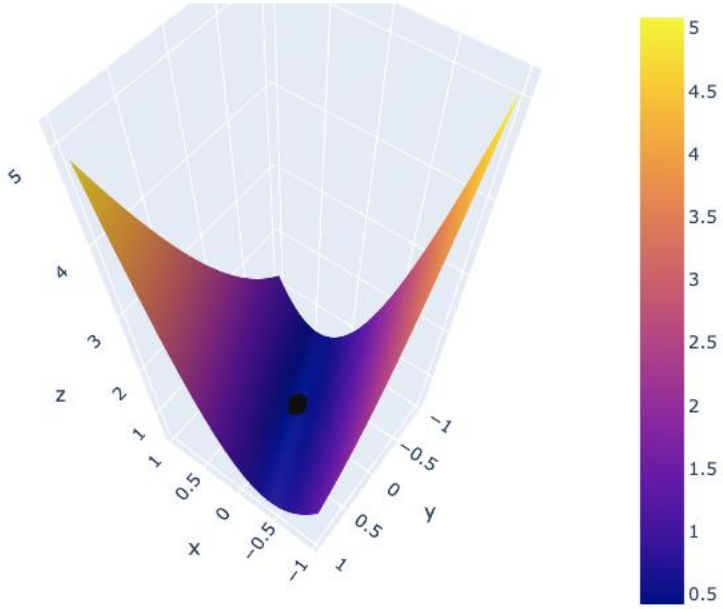




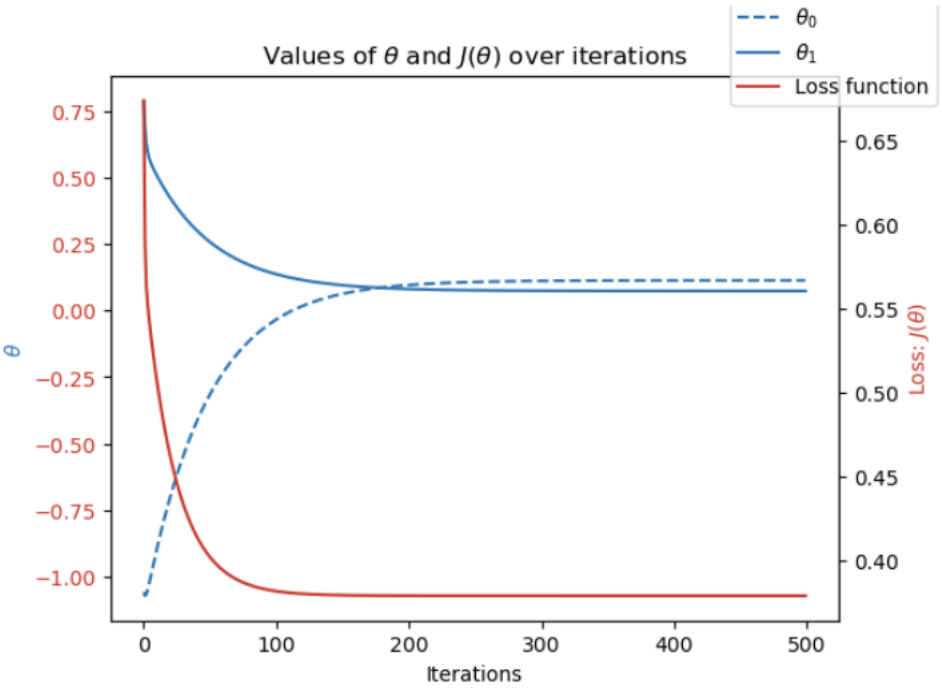
Weather Station Munich in 1990



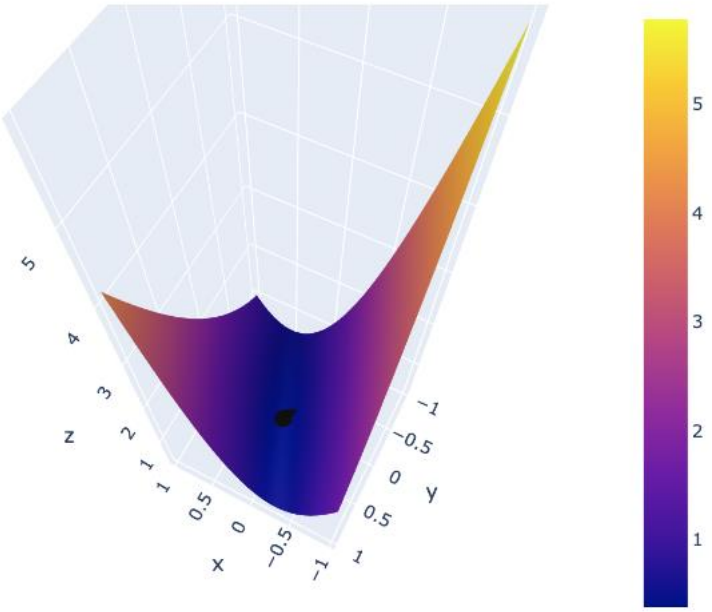
Loss function for different thetas



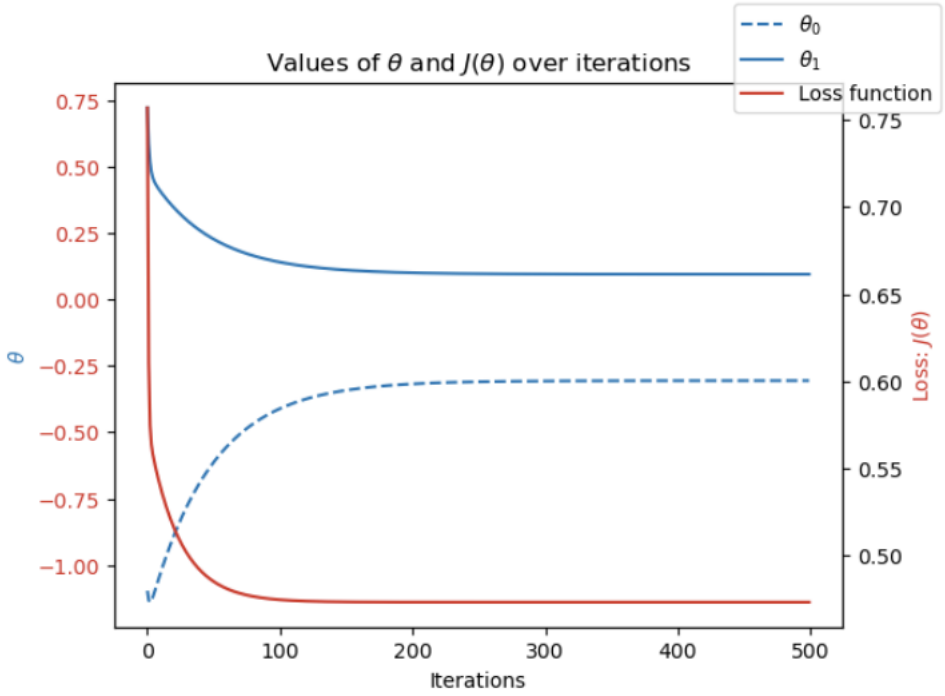
Weather Station Munich in 2020



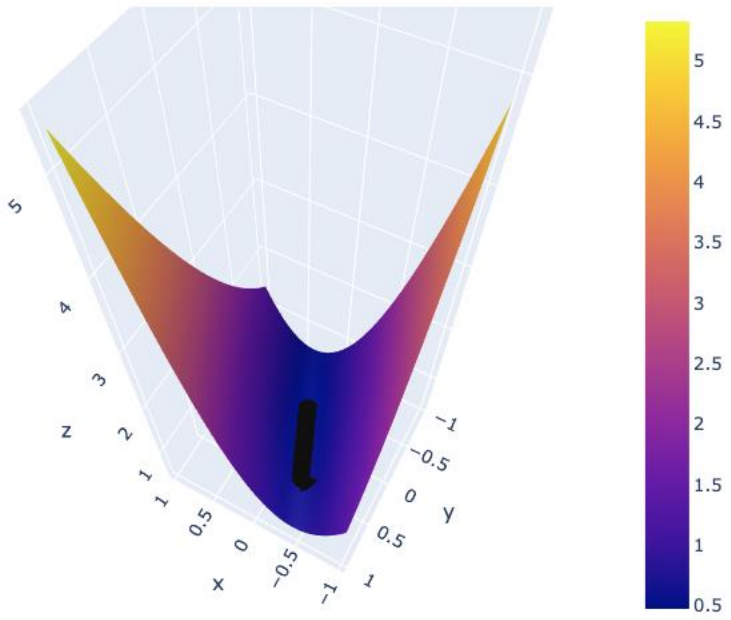
Loss function for different thetas



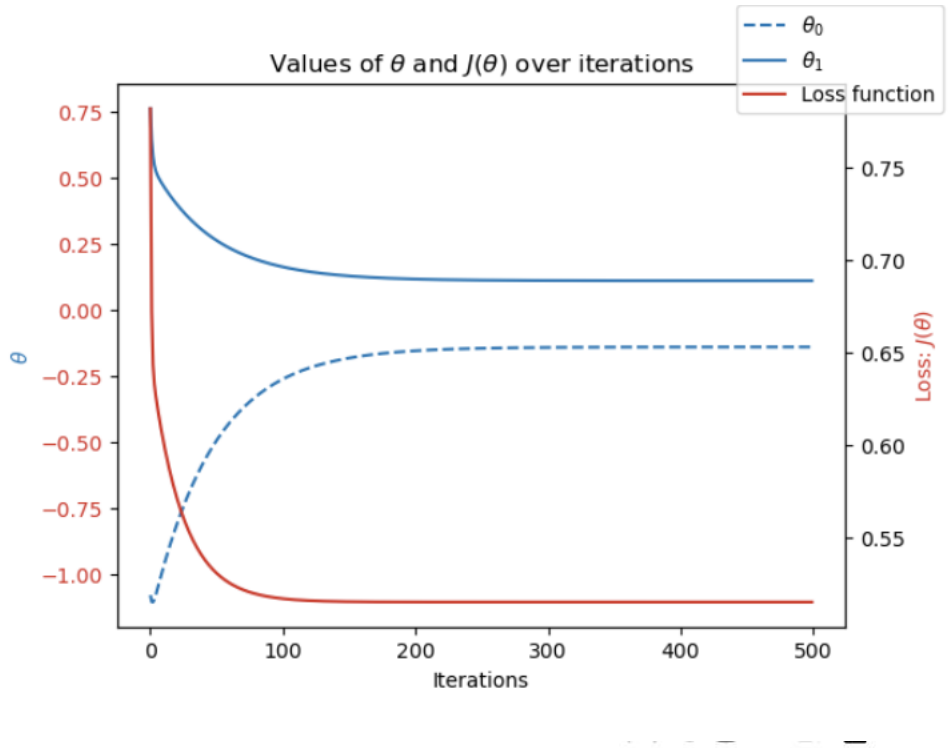
Weather Station Madrid in 1960



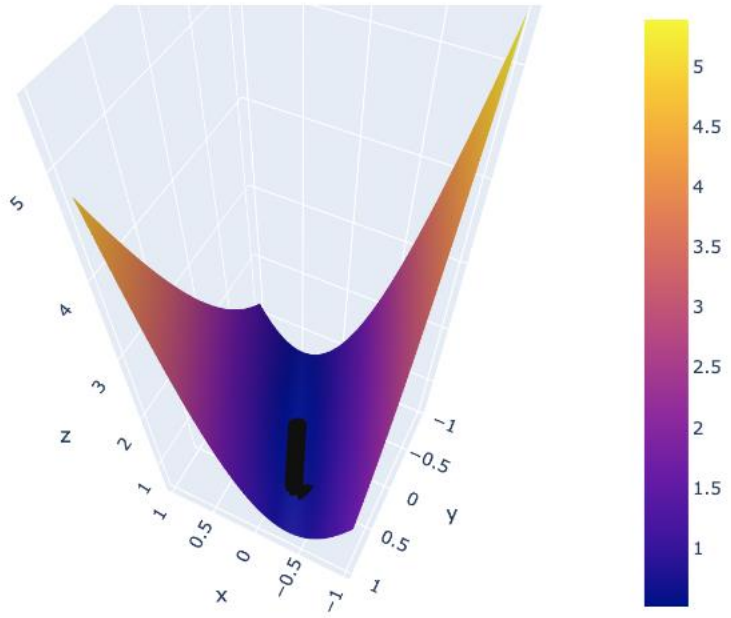
Loss function for different thetas



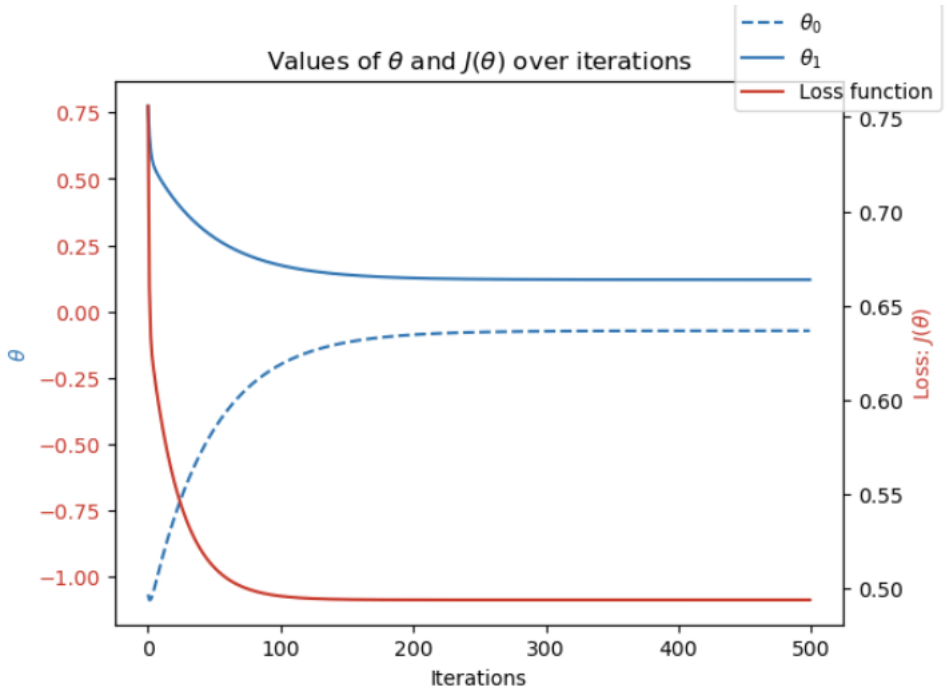
Weather Station Madrid in 1990



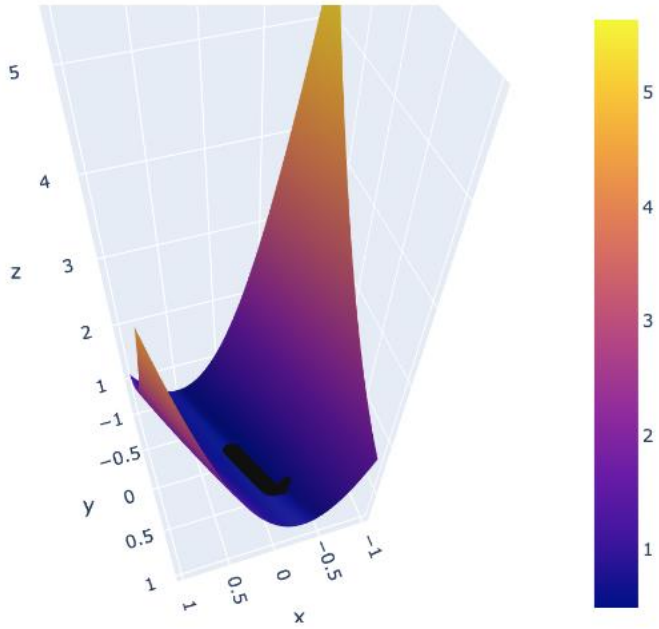
Loss function for different thetas



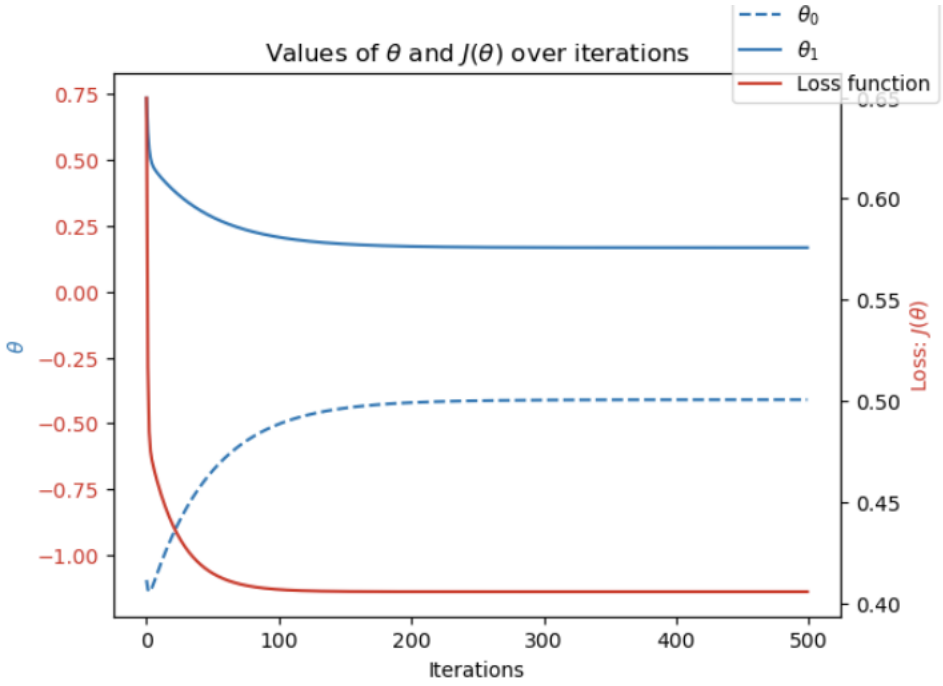
Weather Station Madrid in 2020



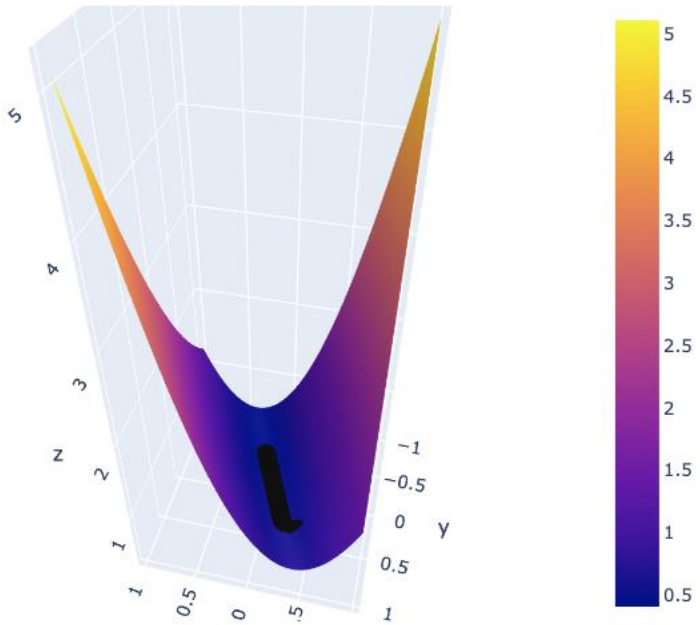
Loss function for different thetas



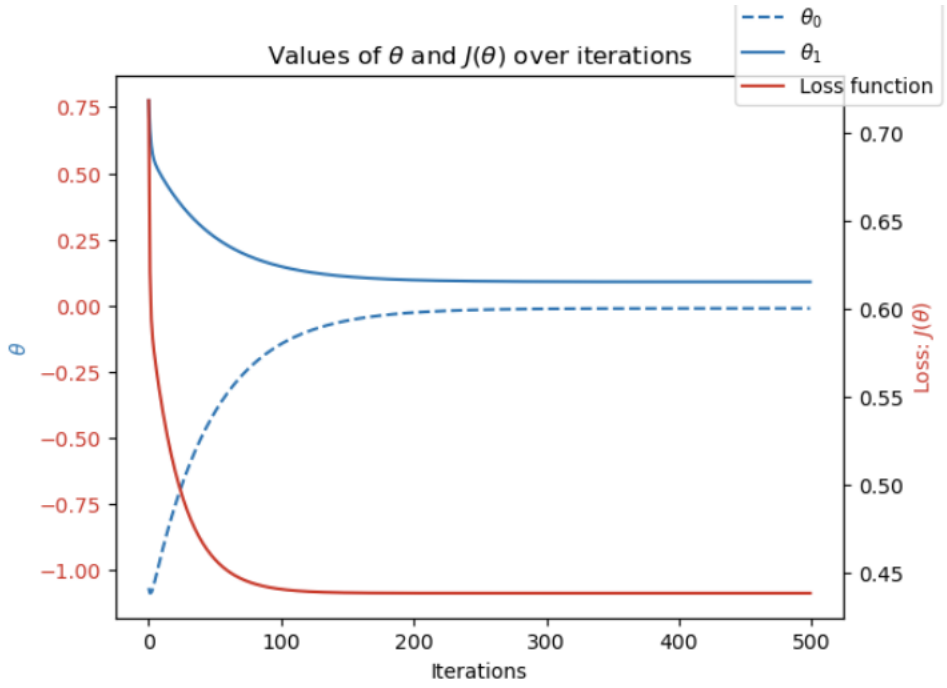
Weather Station Heathrow in 1960



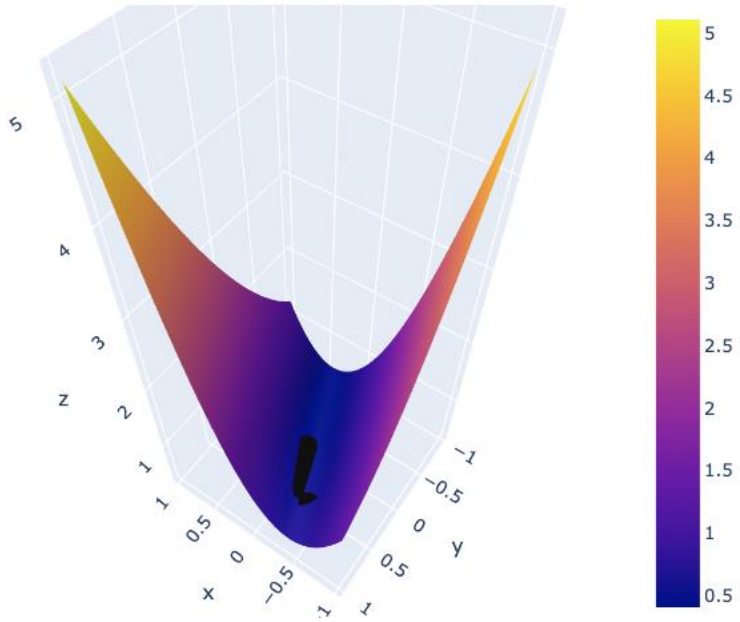
Loss function for different thetas



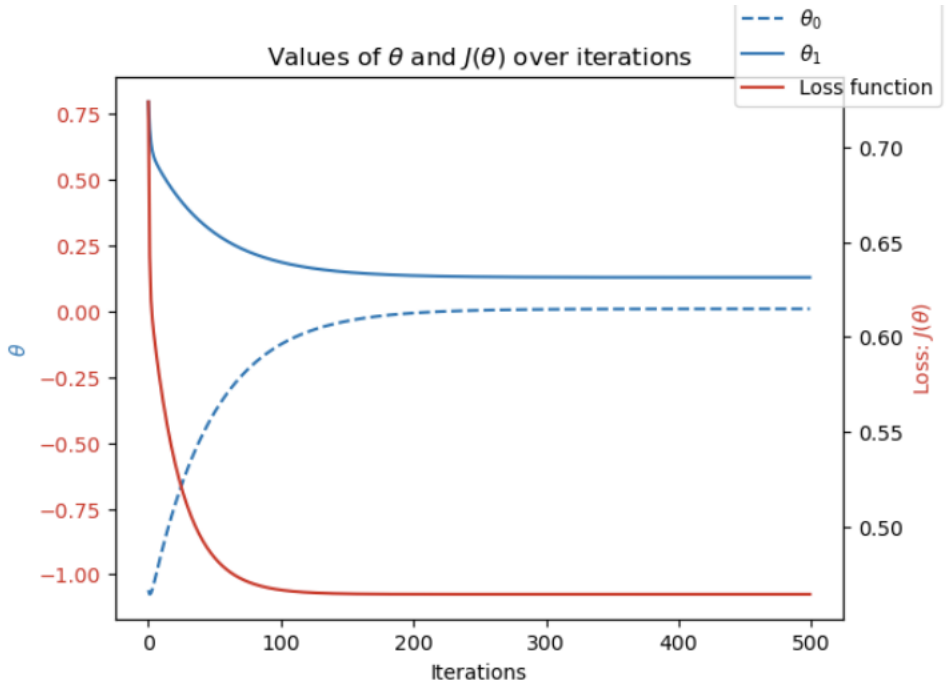
Weather Station Heathrow in 1990



Loss function for different thetas



Weather Station Heathrow in 2020



Loss function for different thetas