

1 Binary Classification through Logistic Regression

In this exercise, we solved a Binary Classification problem using Logistic Regression. As the data points were linearly separable, we used a model of form $z = \theta_0 + x_1 * \theta_1 + x_2 * \theta_2$. The final model, visualized in Section 1.2 is of the form

$$x_2 = (\theta_0 + x_1 * \theta_1)(-1/\theta_2).$$

1.1 Final Model

The final model, e.g. the model where every point is classified correctly has the following parameter:

$$\alpha = 0.05$$

$$\theta_0 = 7.042258968144114$$

$$\theta_1 = -1.0005940726111886$$

$$\theta_2 = 2.9762343453321742$$

The next section shows the resulting model, where the black curve is the fitted model. The green curve shows the initial model with random, initialized parameter $\theta_j \in [-0.1, 0.1]$. We trained the model using the stochastic gradient descent method.

1.2 Plots

