

1. (2 points) You are given a feedforward neural network with 10 inputs, 20 neurons in the first hidden layer, 7 neurons in the second hidden layer, and 1 output neuron. What is the total number of weights in such neural network?
2. (1 point) A major issue when training neural networks is a “local minimum”. What does it refer to and why is it an issue?
3. (1 points) What is the Mean Squared Error and what is it used for?
4. (1 point) What is Keras?
5. (2 points) You are given a neuron with the RELU transfer function (negative inputs become 0 and positive are copied) with 2 inputs x_1 and x_2 and with weights $w_0 = 1$, $w_1 = 3$, $w_2 = -4$. What is the output of this neuron when $x_1 = 3$, $x_2 = 1$.
6. (3 points) You are given function $f(x) = x^4 - 3x + 7$. You want to use the gradient descent algorithm with learning rate $\alpha=0.01$ to find value x where $f(x)$ is the minimum. Your initial guess is $x^{(0)} = 2$. Calculate $x^{(1)}$, the value of you guess after one round of gradient descent.