Assignment 2
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Question 4
4a Experiment on the number of neurons in each hidden layer. Plot the performance on the validation set as a function of the number of neurons in each hidden layer.

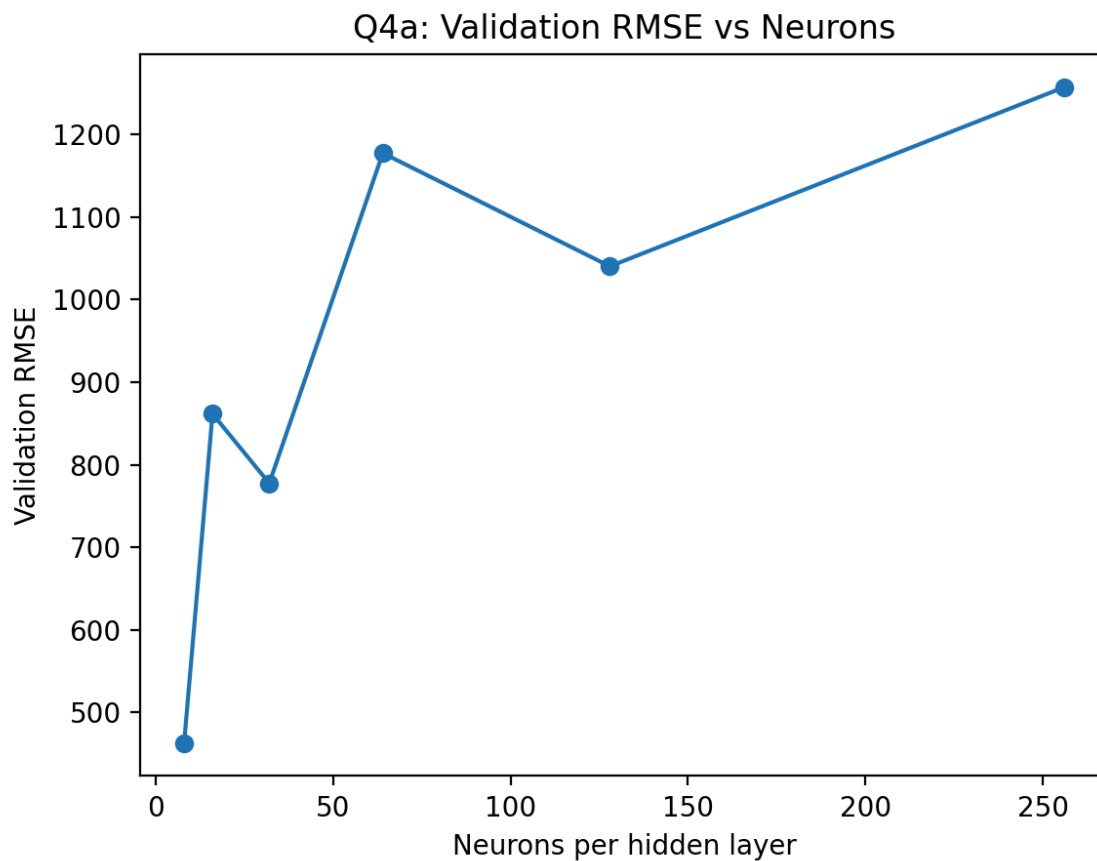   neurons = 8 val RMSE = 462.48443603515625
       neurons = 16 val RMSE = 861.6358032226562
       neurons = 32 val RMSE = 777.4713745117188
       neurons = 64 val RMSE = 1177.670166015625
       neurons = 128 val RMSE = 1040.4510498046875
       neurons = 256 val RMSE = 1257.5548095703125

Q4a: Validation RMSE vs Neurons

4b Experiment on the number of hidden layers in your network. Plot the performance on the validation set as a function of the number of hidden layers in your network.
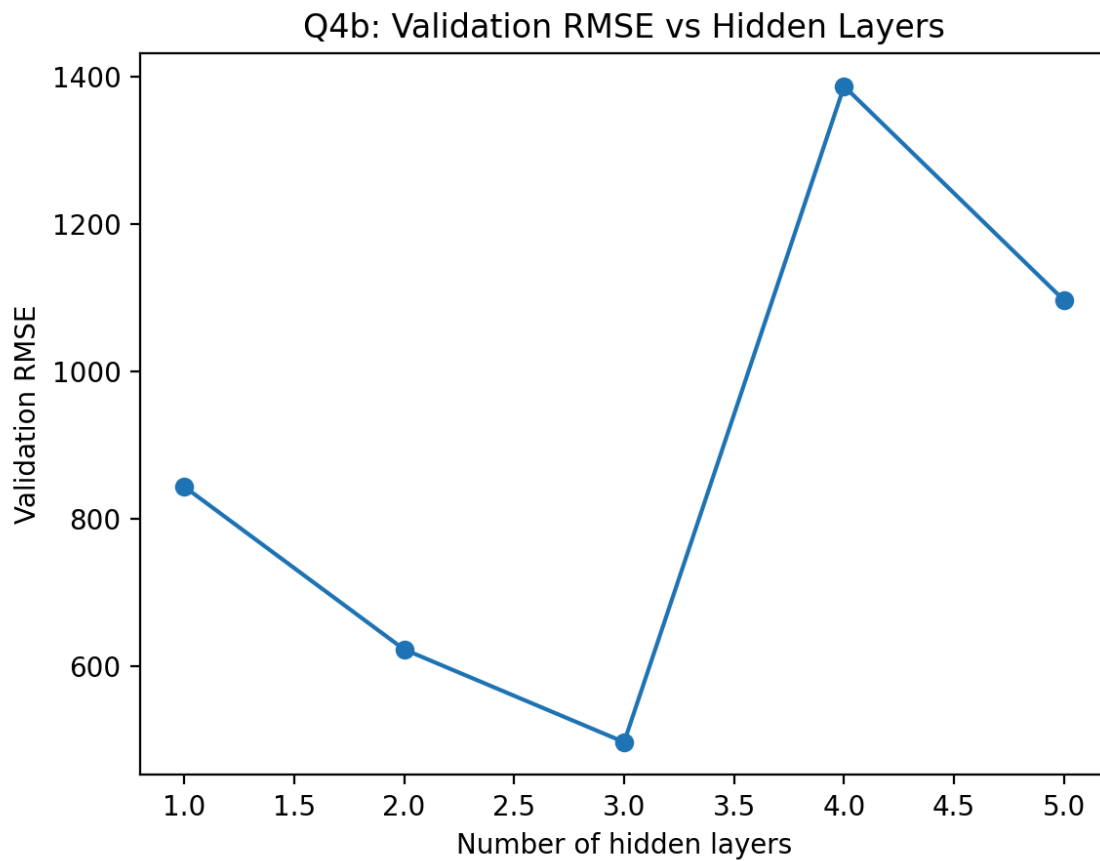
       layers = 1 val RMSE = 843.345458984375
       layers = 2 val RMSE = 622.4334106445312
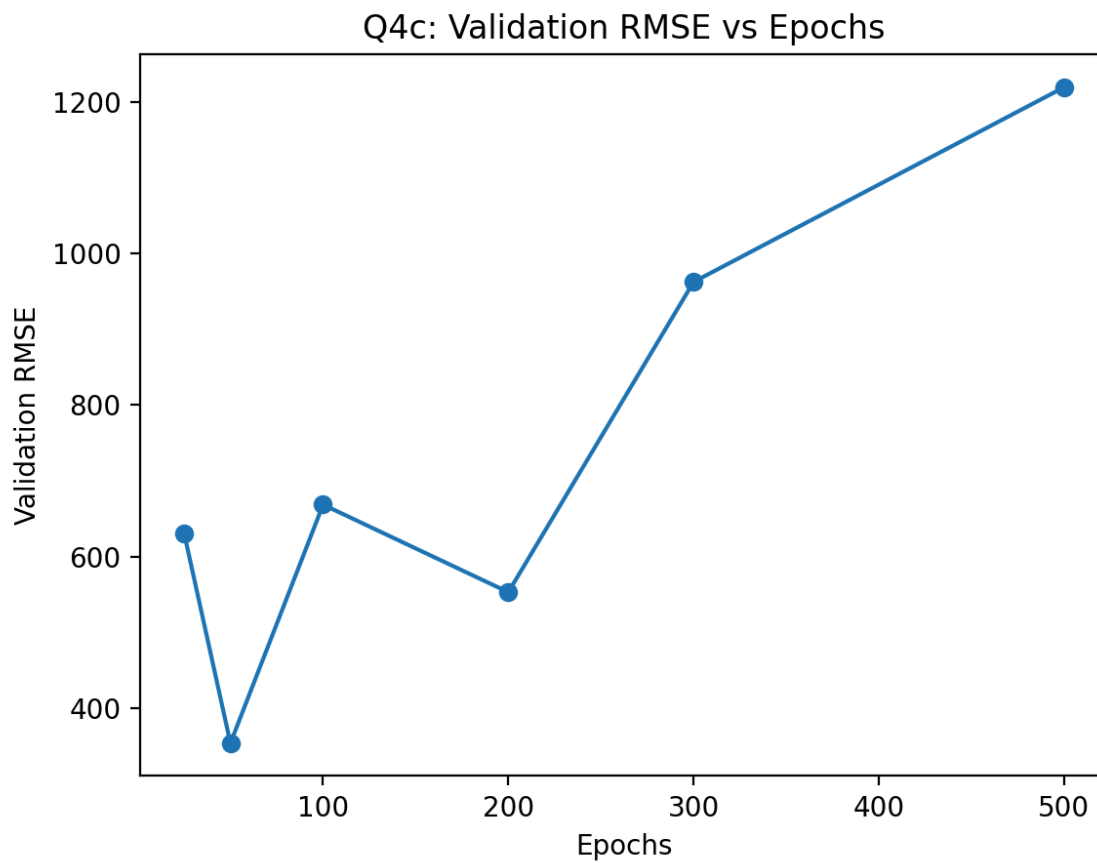   layers = 3 val RMSE = 496.66143798828125
       layers = 4 val RMSE = 1386.370849609375
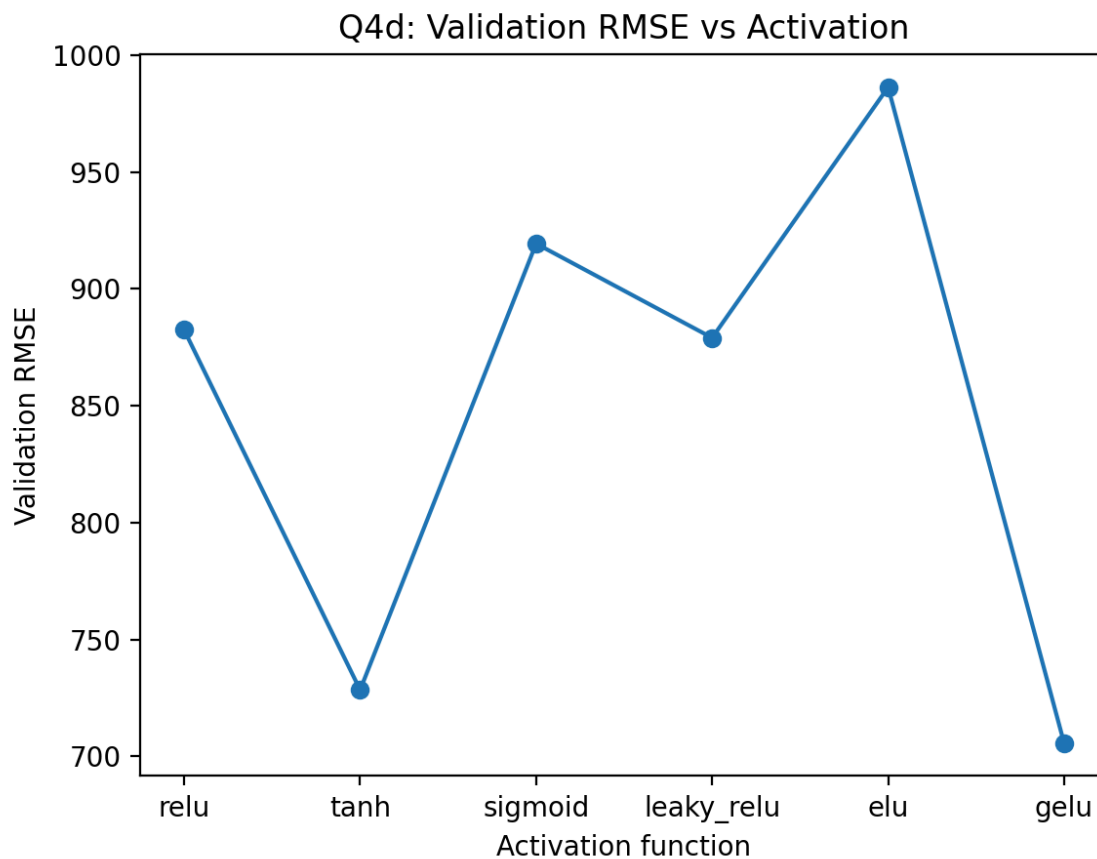   layers = 5 val RMSE = 1095.889404296875

Q4b: Validation RMSE vs Hidden Layers

4c Experiment on the number of epochs of training. Plot the performance on the validation set as a function of the number of epochs of training.

epochs = 25 val RMSE = 630.88818359375
epochs = 50 val RMSE = 354.1822204589844
epochs = 100 val RMSE = 668.591552734375
epochs = 200 val RMSE = 553.2054443359375
epochs = 300 val RMSE = 962.2250366210938
epochs = 500 val RMSE = 1218.9207763671875

4d Experiment on the activation function. Plot the performance on the validation set for various common activation functions.

    activation = ReLu val RMSE = 882.4246826171875
    activation = tanh val RMSE = 728.4097290039062
    activation = sigmoid val RMSE = 919.3385620117188
    activation = leaky_ReLu val RMSE = 879.0379638671875
    activation = elu val RMSE = 986.2381591796875
    activation = gelu val RMSE = 705.644287109375

Q4d: Validation RMSE vs Activation

4e For the model with best performance on the validation set in the above experiments, report performance on the training set, validation set, and held out test set.

    Best settings: 64 neurons, 2 layers, ReLu activation, 50 epochs
    Train RMSE: 567.7055053710938
    Val   RMSE: 701.7510375976562
    Test RMSE: 631.073974609375