Exercises – Chapter 7 – Neural Networks

Homework – hands-on exercises.

1. Rain in Seattle – Recurrent Neural Network

We use an RNN to predict rain based on weather data from Seattle (1948-2017). The data and problem are presented here: https://www.kaggle.com/datasets/rtatman/did-it-rain-in-seattle-19482017 . The dataset and the .R program are already uploaded in Canvas for your convenience, and explained here: https://www.kaggle.com/code/rtatman/beginner-s-intro-to-rnn-s-in-r

2. Convolutional Neural Network – image classification using tensorflow

Fist make sure to go through the CNN intro video, already posted in Canvas: https://www.youtube.com/watch?v=JB8T_zN7ZC0&list=TLPQMTIwMjIwMjGQjVHvzsmLlA&index=2 Then follow this simple CNN image classification example using the CIFAR-10 dataset. The dataset and the method are described: https://tensorflow.rstudio.com/examples/cifar10_cnn.html

Copy the code in RStudio and try the program to get started with tensorflow.

3. Recurrent Neural Network – using tensorflow

In the following example RNN is used for image classification. The example uses the segmented black-and-white clothing dataset MNIST and treats every image as a sequence of pixels. Therefore RNN works reasonably well. A description of the dataset and the method are provided here, together with the code itself: https://tensorflow.rstudio.com/tutorials/beginners/basic-ml/tutorial_basic_classification/ Copy the code in RStudio and try the program yourself.

4. Neural Network neuralnet library – house price problem

Go through and familiarize yourself with this example from Kaggle: https://www.kaggle.com/chandraroy/house-price-beginners-neural-network/script. You can find both example code and datasets (in the data tab), look for the input and outputs and expand the sources. Subsequently solve this problem using tensorflow.

5. Neural network – Titanic example

Apply a neural network to the Titanic task from last week. This link provides example code and datasets. https://www.kaggle.com/dignil/titanic-svm-random-forest-and-neural-network/notebook#Neural-Network. Go through and familiarize yourself with this solution. Subsequently solve this problem using tensorflow.