Exercise 2.2: Complex Machine Learning Models and Keras Part 1

CNN Model

I chose to use a CNN model rather than a RNN. Even though it is mainly used for spatial or image data, it still works with the climate data set. The RNN uses time spatial analysis having removed dates and months from the data set made me lean towards the CNN. I tried and test various hyperparameters shown below. Changing things such as Epochs, Hidden Layers, Batch size as well as different activation functions such as ReLU, softmax, sigmoid, and tanh. Only softmax accurately displayed all 15 weather stations.

Scenario 1:

Hyperparameters

A screen shot of a computer code

AI-generated content may be incorrect.

Partial Output

A screenshot of a computer

AI-generated content may be incorrect.

Confusion Matirx

A screenshot of a computer

AI-generated content may be incorrect.

Scenario 2:

Hyperparameters

A screen shot of a computer code

AI-generated content may be incorrect.

Partial Output

A white text with black numbers

AI-generated content may be incorrect.

Confusion Matirx

A screenshot of a computer

AI-generated content may be incorrect.

Scenario 3:

Hyperparameters

A screen shot of a computer code

AI-generated content may be incorrect.

Partial Output

A white background with black numbers and a white background

AI-generated content may be incorrect.

Confusion Matirx

A screenshot of a computer

AI-generated content may be incorrect.

Scenario 4:

Hyperparameters

A screen shot of a computer code

AI-generated content may be incorrect.

Partial Output

A screenshot of a computer

AI-generated content may be incorrect.

Confusion Matrix

A screenshot of a computer screen

AI-generated content may be incorrect.

Scenario 5:

Hyperparameters

A screen shot of a computer code

AI-generated content may be incorrect.

Partial Output

A white background with black text

AI-generated content may be incorrect.

Confusion Matrix

A screenshot of a computer

AI-generated content may be incorrect.

Observations

The General accuracy is very low, thus further tuning of Hyperparameters is needed, However Softmax is the only activation function that shows all 15 weather stations when used at Epochs – 30, Batch size -16 and n\_hidden – 32. Thus I would say Softmax is the best activation function for the climate data when using the CNN model.