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CISC 251 Exercise Sheet 4

1. I built a supervised neural network in KNIME in order to try and classify the wines. I used the following workflow, splitting my wine data into an 80/20 split for training and testing, respectively. This is because we are asked to do a 5 fold cross validation, therefore we will use a 80/20 random split:

A picture containing text, map, indoor

Description automatically generated

I chose for it to randomly partition the data every time:

Graphical user interface, text

Description automatically generated

I used 3 layers as we have 14 inputs (square root of 14 is close to 3). I also tried using one and three hidden layers just to see if there was a difference but there wasn’t (not sure if I’m doing something wrong)

Graphical user interface, text, application

Description automatically generated

Without normalization, here are the results:

The model has an accuracy of 33.3% (got the same percentages running it 3 separate times). Below is the confusion matrix:

Table

Description automatically generated

As we can see, the model predicted everything to be Type 2.

**NORMALISATION:**

Here is how I implemented normalization: (please do tell me if I did anything wrong, as I really want to get this right haha)

Chart, scatter chart

Description automatically generated

Here is the configuration for the Normalizer node:

Graphical user interface, text, application, email

Description automatically generated

This should normalize everything.

Here are the results from normalizing:

Amazingly, this model has a prediction accuracy of 0.94444%. Here is the confusion matrix:

Graphical user interface, text

Description automatically generated

As we can see, the model is very good. These are the same results as I got when running these 5 separate times. In terms of time, I didn’t find that these models took more than 10 seconds to run so it was hard to notice a big difference in computation. The normalizing of the data made a massive difference in assisting the model to classify the wines. Please let me know if I did anything wrong or if there are any KNIME modules I should look at! :)Thanks