Project 2. Neural Network

Task 1: Watch neural network videos posted in “12 Neural Network. pdf” (90 minutes)

Task 2: Analysis

Group members are encouraged to use the same dataset for their individual components. As this will help with group presentation.

Data

Websites for data:

<https://archive.ics.uci.edu/datasets/>

<https://www.kaggle.com/datasets>

Sample Datasets:

You can use these sample datasets, or choose a dataset of your interest.

Dataset on bright space are cleaned. The links provide descriptions of the datasets.

“speeddating\_clean.csv”

<https://www.kaggle.com/datasets/ulrikthygepedersen/speed-dating>

“wine\_quality.csv”

<https://archive.ics.uci.edu/dataset/186/wine+quality>

“newspopularity.csv”

<https://archive.ics.uci.edu/dataset/332/online+news+popularity>

Individual Component

Each member will independently perform the following analyses on the dataset.

Test 8 (or more) different neural network specifications and record their performance (on the same target variable).

In each test, you can change which variables are used for the prediction, the percentage of data used in the training set, the structure of the network (such as the number of hidden layers, the number of neurons in each layer), the activation function used, and epochs used.

Record the code, runtime, and accuracy for each test.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| variables | Training percentage | Structure | Activation | code | epochs | Run time | Accuracy |
| Y:  Match  X: all other columns | 80 | (62,8,1) | Relu,  Relu,  sigmoid | NN.add(Dense(12,input\_dim=62, activation='relu'))  NN.add(Dense(8,activation='relu'))  NN.add(Dense(1,activation='sigmoid')) | 100 | 8sec | 0.97 |
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Briefly explain: Did you observe any patterns in how the specifications might affect accuracy?

Group Component

As a group, you are expected to collaborate on a presentation (6-8 minutes; please do not exceed this time).

No group report is required.

The presentation should include:

1. Background of the dataset, variables, the goal of the analysis
2. Neural network testing strategy and performance
3. Takeaways (what did you learn about the dataset? What knowledge about neural networks did you discover and learn?)

Evaluation Criteria:

* **Knowledge discovery, research depth, understanding of content**

 **Team Collaboration and Preparation**  
Is the flow of the presentation smooth and coordinated?

 **Presentation Delivery and Engagement**  
Are the presenters confident, clear, and engaging?