

Lab Assignment 4 - Neural Networks

Create Neural Network model for the text classification of “Motivational Quotes vs Demotivational Quotes”. If you want to work with any other similar two classes in every day conversation such as “Angry Quotes vs Happy Quotes” also, you are free to work with them and in any language of your choice.

Steps

1. **Dataset Creation:** Create a dataset of 20 lines of text for class 1: motivational lines (each line considered as document) and 20 lines of text for class 2: demotivational lines. 20 lines of text per class and store them in text file.
2. **Pre-processing:** Read the text from the file, remove all the stop words (or common words such as a, an, the, for, in etc., refer internet for stop word list). Find the unique word list and build a term frequency matrix as below.

Document 1: You will win if you work hard (motivational lines)

Document 2: Be lazy and win the life (demotivational lines)

	X						Y
Word Frequency	Be	win	work	hard	lazy	life	
Document 1	0	1	1	1	0	0	Motivational
Document 2	1	1	0	0	1	1	Demotivational

Note: avoid varieties and use same kind of words so that X will not be sparse.

3. **Dataset Preparation:** Split the dataset (75% training and 25% testing) into training and testing sets with term frequencies as input X, text class (Motivational vs Demotivational) as target label Y.
4. **Model Creation:** Train a single layer Neural Network model with 32 nodes (using Keras preferably) for 100 epochs.
5. **Analysis:** Do the following analysis
 - a. Run different single layer Neural Network models with number of nodes as 8, 16, 32, 64, 128, 256, 512 and 1028. For all the models plot the training accuracy, testing accuracy and running time for testing in bar chart.
 - b. Run different Neural Network models with number of layers as 2, 3, 4, and 5, each layer with 32 nodes. For all the models plot the training accuracy, testing accuracy and running time for testing in bar chart. Analyse the results and discuss what you discovered!

Suggested Libraries:

Python packages such as Numpy, Pandas, NLTK, Keras (recommended), Tensorflow