Assignment – Neural Networks

In this assignment you are expected to code up a neural network from scratch without using ML specific libraries - keras, torch, tensorflow, sklearn and the like. You are free to use other libraries like numpy, pandas, matplotlib etc The link to the dataset for the model is provided below. You are free to use any of the regular python libraries for this task except the ones mentioned above. Futher details about the model are as follows:

1. Your model must be able to perform binary classification on the given dataset.
2. Refrain from hard coding any part of the network. This means your network must be able to take the number of hidden layers, number of neurons per layer and activation for each of the layers as user input or as parameters to the model in the front-end code (as in keras) and build the required model. But do mention the input format so that evaluating your model will be easier.
3. Your model must be as flexible as possible. This means that with minimal/no change to the back-end implementation, you should be able to perform regression or categorical classification as well.
4. Your model must be robust and must be able to handle big data easily without much hassle. *Hint: Use vectorization as much as possible.*
5. Extra credit: Try to implement SGD with momentum, RMSprop and Adam.

Consider this assignment as the epitomy of ML. If you can do this, I guarantee you that you have quite successfully understood the concepts related to Neural Networks. For evaluation, your model will be tested for robustness and accuracy. You need not add any sort of regularization to you network, but make sure your model does not overfit too much due to too many parameters. Play around with your network and experiment with various learning rates, activation functions and initializations. Happy coding!

PS. Make sure to shuffle your dataset before training. Use a 70-30 train-test split for evaluation.

https://drive.google.com/file/d/1bHDzljhwbm0nL6jCX00UmtLIhMLKXz20/view?usp=sharing