

# CS597 Homework 1

Due March 25, 2019 11:59PM

Question 1: **[Binary Classification] [40 pts]** Use UCI's sentiment dataset (<https://archive.ics.uci.edu/ml/datasets/Sentiment+Labelled+Sentences>) to perform binary classification to classify reviews into positive or negative. Use k-fold cross validation and show loss/accuracy plots by epoch.

- Try a different activation function and report the difference.
- Try a different optimizer and report the difference.

Question 2: **[Multiclass Classification] [30 pts]** Use Keras' built-in Reuters dataset (`from keras.datasets import reuters`) to classify 46 different topics. Use k-fold cross validation and show loss/accuracy plots by epoch.

- Change number of layers, report the difference.
- Increase number of hidden units, report the difference.
- Decrease number of hidden units, report the difference.

Question 3: **[Regression] [30 pts]** Use Keras' built-in Boston House Pricing dataset (`from keras.datasets import boston_housing`) to perform regression and predict house prices. Use k-fold cross validation and show loss/MAE plots by epoch.

- Compare the results when using no regularizer, L2 regularizer and Dropout as a regularization method.
- Try a different loss function and report the difference.

Send your homework as a Jupyter notebook (in a zip file if you have more than one file) to [yanardag.pinar@gmail.com](mailto:yanardag.pinar@gmail.com) with "HW1 CMPE597" keyword in the title. When applicable, you must include your answers to the notebook as a text (e.g. commenting on the difference in performance when we increase number of hidden units)

Note: Use **colab** (<https://colab.research.google.com/>) if you don't have a GPU.

Note 2: Experiment with different number of layers, and number of hidden units for each question to find an appropriate choice.

Note 3: Everyone has 1 day grace period which means that you are allowed to submit 1 day late for one of the 3 homeworks. After you use your 1-day, your homework will be deducted by 5 points per hour.