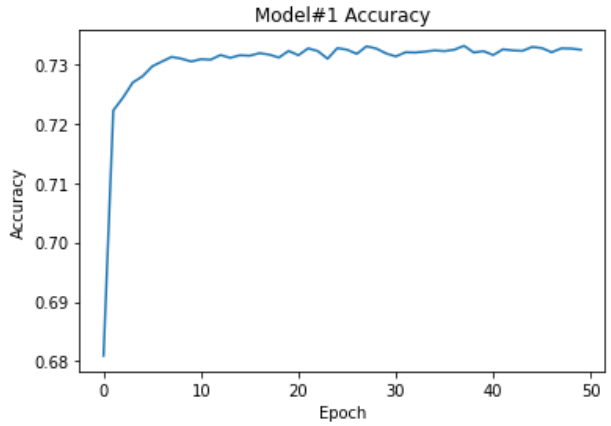
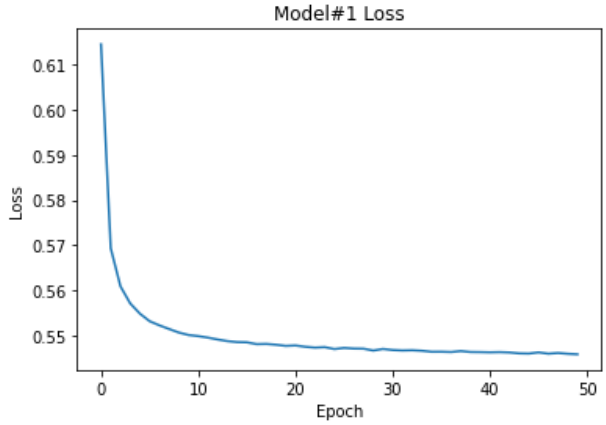
Deep Learning Homework Write Up

Alphabet Soup is a non-profit organization that grants funding to thousands of organizations. With the data provided by the business team, machine learning and neural networks were performed. This analysis will explain the algorithm used to create an optimized model in determining funded applicant's success.

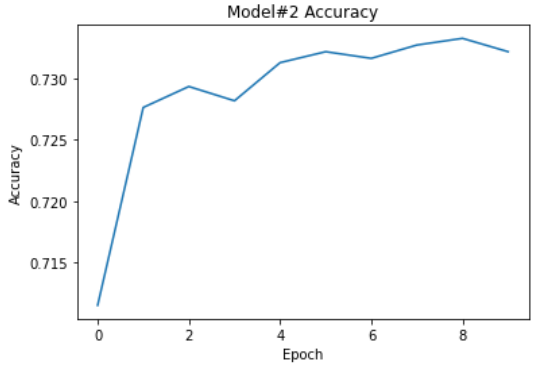
The target IS_SUCCESSFUL. The features are APPLICATION_TYPE, AFFILIATION, CLASSIFICATION, USE_CASE, ORGANIZATION, INCOME_AMT, SPECIAL_, ASK_AMT. The columns of EIN and Name were non-beneficial columns and were dropped from the input data.

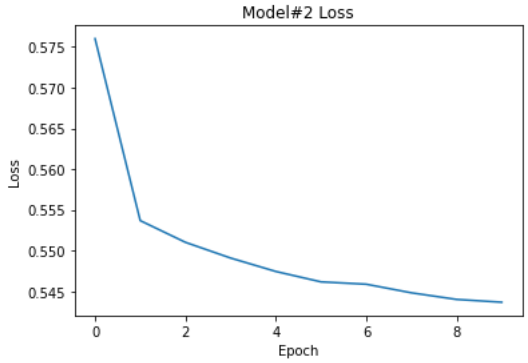
For Model#1: Two hidden layers with the activation relu was used and an output of sigmoid. I wanted to get a baseline of how the model would act with this particular setting. 50 epochs were used. My application cut off was 500 because of the difference between T7 and T10. My classification cut off was at 200 because of the difference between C1700 and C4000. I did not achieve the target model performance of 75%. My Model#1 had an accuracy of 72.9%.



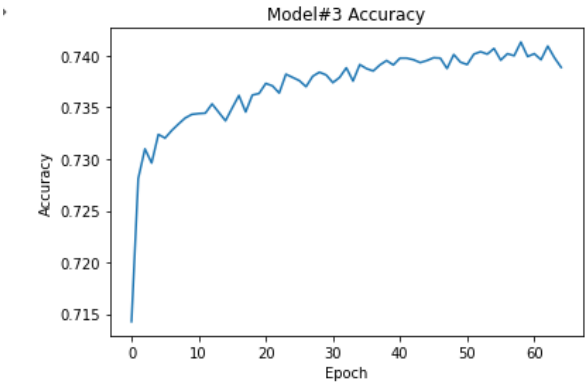


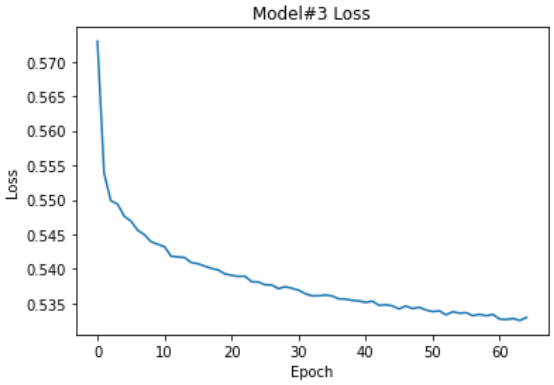
For Model#2: Three hidden layers with the activation relu, tanh, and relu was used and an output of sigmoid. 10 epochs were used. I did not achieve the target model performance of 75%. My Model#2 had an accuracy of 72.6%. This model did slightly worse than Model#1.



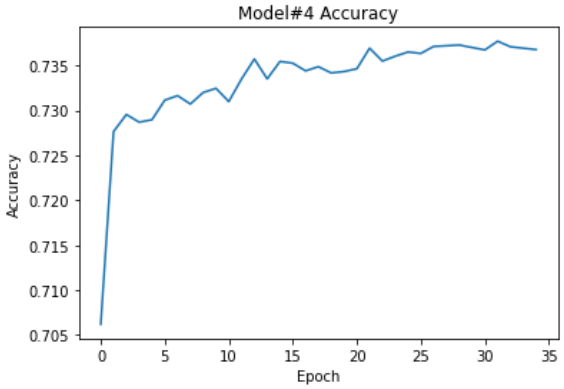


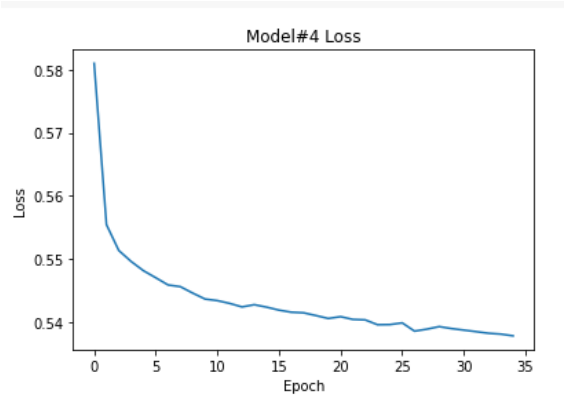
For Model#3: Four hidden layers with the activation relu, tanh, tanh, relu was used and an output of sigmoid. 65 epochs were used. I did not achieve the target model performance of 75%. My Model#3 had an accuracy of 72.9%. This model did approximately the same as Model#1.





For Model#4: Two hidden layers with the activation relu and tanh was used and an output of sigmoid. I took the mindset of less is best. 35 epochs were used. I did not achieve the target model performance of 75%. My Model#1 had an accuracy of 72.8%.





For Models#2,3 and 4, my application cut off was 200 because of the difference between T10 and T9. My classification cut off was at 85 because of the difference between C2800 and C7100.

In conclusion, the deep learning model could assist in determining if an organization will be successful with the funding given. This model can also better assist Alphabet Soup in distributing funds to successful organizations based off the existing data.