Part A Report

Name: John Doe (replace with your own name and delete this instruction!)

Assignment 6: Perceptron Classification and Training

CSE 415 Introduction to Artificial Intelligence, Winter 2021, University of Washington

Please answer each question using text in Blue, so your answers stand out from the questions.

QA1. How many epochs were required to train your perceptron on the 2-class Iris data having 2 features?

QA2. Include a graphic produced using matplotlib that shows both the training data points (in separate colors) and the “separating” lines implied by the weights at the end of each training epoch.” (Reduce the graphic as necessary to make it fit here without taking up more than half the page.)

Was there any thrashing (oscillation in the separator, such as flipping slope back and forth between positive and negative values, or having its y intercept jumping up and down as epochs proceed? How would you describe the progress of the learning, on the basis of the plot?

QA3. What was the performance of your perceptron on the test data?

QA4. After plotting the ring data, describe its distribution in words.

QA5. Describe the sequence of separators obtained when training your perceptron for 5 epochs using the ring data. To what extent is there convergence? Thrashing? Hope for convergence?

QA6. After you have re-mapped the ring data with the provided non-linear mapping function, plot the data and describe the distribution.

QA7. After training your perceptron on the re-mapped ring data, did it achieve convergence, and if so, how many epochs were used?

QA8. What does these results suggest about the power of perceptrons to classify data that may consist of clusters that cannot be separated by a linear manifold (such as a line or plane)?

QA9. Did you run into any difficulties either setting up for Part A or running the programs and answering the questions? If so, please describe them.

QA10. What portion(s) of Part A did you find most worthwhile and why?