DS 501: STATISTICAL & MATHEMATICAL METHODS FOR DATA SCIENCE
ASSIGNMENT 6

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QUESTION 1: How did you map the values of predictions from the perceptron model to labels? Give an exact mathematical expression or pseudocode.
Any value between 3 and 4 can be used as a threshold and I used 3.5 as a threshold value i.e.

- Predicted values > 3.5 can be classified as label 5
- Predicted values < 3.5 can be classified as label 2

QUESTION 2: (ASSUME 2 IS THE POSITVE CLASS. MARKS DEDUCTED IF YOU DO NOT ASSUME THIS)
RESULTS

RESULTS FOR TRAINING DATA	**RESULTS FOR TEST DATA**
η= 0.001, α= 0, iterations = 100 Actual 2 Actual 5 Total Predicted 2 TP =150 FP =0 150 Predicted 5 FN =0 TN =125 125 Total -> 150 125 275 BAC = 1	η= 0.001, α= 0,iterations = 100 Actual 2 Actual 5 Total Predicted 2 TP =144 FP = 8 152 Predicted 5 FN = 6 TN =117 123 Total -> 150 125 275 BAC = 0.948
η= 0.7, α= 0.9,iterations = 100 Actual 2 Actual 5 Total Predicted 2 TP = NA FP = NA Predicted 5 FN = NA TN = NA Total -> BAC =	η= 0.1, α= 0.5,iterations = 100 Actual 2 Actual 5 Total Predicted 2 TP = NA FP = NA Predicted 5 FN = NA TN =NA Total -> BAC =
η= 0.0001α= 0. 1, iterations = 50 Actual 2 Actual 5 Total Predicted 2 TP = 144 FP =9 153 Predicted 5 FN = 6 TN =116 122 Total -> 150 125 275 BAC = 0.944	η= 0.0001α= 0. 1, iterations = 50 Actual 2 Actual 5 Total Predicted 2 TP =146 FP =16 162 Predicted 5 FN =4 TN =109 113 Total -> 150 125 275 BAC = 0.9226667
η= 0.0001 α= 0.001, iterations = 50 Actual 2 Actual 5 Total Predicted 2 TP = 146 FP =11 157 Predicted 5 FN = 4 TN =114 118 Total -> 150 125 275 BAC = 0.9426667	η= 0.0001 α= 0.001, iterations = 50 Actual 2 Actual 5 Total Predicted 2 TP =145 FP =13 158 Predicted 5 FN = 5 TN =112 117 Total -> 150 125 275 BAC = 0.9313333

QUESTION 3: Give YOUR opinion or conclusions about the results
I noticed when the parameters of eata and alpha were set to minimum our model converges and gives us the best results but when we increased the parameters values it starts diverging.