EXAM 1 Problem 1:

1. Supervised learning has a target response variable while unsupervised learning does not have a target response variable
2. Clustering algorithms minimize the distance or variance within clusters. For example, in the kmeans algorithm, you choose a certain number of clusters and then tries to pick clusters that minimize the variance of those clusters.
3. Classification problems deal with discrete outcomes, ie whether something is a cat or not. Regression problems deal with floating point outcomes.
4. A loss function is a function of how much error there is between the model’s prediction and the actual outcome. One example for classification is a binary cross-entropy loss function. One example for regression is the mean squared error, which takes the means of the squared errors.
5. kNN or k nearest neighbors, is a lazy supervised learning algorithm because it does not actually process the training data until a prediction is made. In classification, basically it classifies a point as the same class as the majority of it’s k nearest neighbors.
6. A perceptron is a one node neural network. You feed data into a perceptron, then it determines certain parameters and their weights, and then it passes through an activation function that determines whether or not the node should be activated, and then it produces an output.
7. Softmax is used in the output layer for classification neural networks. It converts the output into the probabilities of each classification