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Comp 5600

AI

HW 2

1. |14|

|32|

|50|

1. Lim x->0 (2x\*cos(x^2))/(2cos(x)sin(x)) =

Lim x->0 (2cos(x^2) – (4x^2)sin(x^2))/(2cos(x)^2 – 2(sin(x))^2) = 1

1. 1|3 + 2|4 + 3|1^4 + 4|2^6 + 5|3 + 6|4 = 1/36 + 1/36 + 2/36 + 2/36 + 1/36 +1/36 = 8/36 = 2/9
2. Clustering algorithm is the chief algorithm used in search engine to group similar search results together and separating dissimilar search results. Another application is your spam filter, using k-means to group data together of known spam emails to identify new spam and mark it as spam. Marketing and sales algorithms also use clustering to target people and group people together with similar interests, so they use their ad money efficiently. Another use is by credit card companies to find out if there is fraudulent behavior on your card to contact you and deny some charges on your card.

6. Since k-means finds the closest points and groups them by distance to a central point, it cannot be used to group this data cluster, as one group lies in an outside ring around the other, meaning the data cluster of the outside ring will always be in the same cluster as points from the inside ring when using k-means, unless you use a very large k, in which case the clustering doesn’t provide meaningful data for that problem anyway.