

Homework 11

Instructions

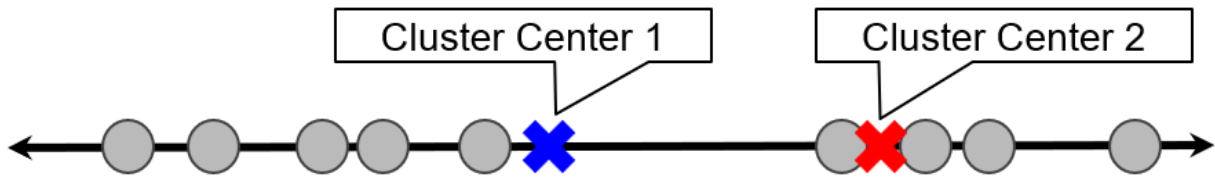
This homework contains **2** concepts and **5** programming questions. In MS word or a similar text editor, write down the problem number and your answer for each problem. Combine all answers for concept questions in a single PDF file. Export/print the Jupyter notebook as a PDF file including the code you implemented and the outputs of the program. Make sure all plots and outputs are visible in the PDF.

Combine all answers into a single PDF named `andrewID_hw11.pdf` and submit it to Gradescope before the due date. Refer to the syllabus for late homework policy. Please assign each question a page by using the “Assign Questions and Pages” feature in Gradescope.

Here is a breakdown of the points for programming questions:

| Name | Points |
|--------------|------------|
| Concept 1 | 8 |
| Concept 2 | 4 |
| M11-L1-P1 | 9 |
| M11-L1-P2 | 9 |
| M11-L1-P3 | 9 |
| M11-L2-P1 | 9 |
| M11-HW1 | 72 |
| Total | 120 |
| Bonus | 6 |

Problem 1



We have randomly placed two cluster centers amongst the data above to initialize the K-Means algorithm.

Q1: Now we will assign a cluster to each of the data points, based which centroid they are closest to. How many points are assigned to each cluster center. (Text Entry)

Q2: Now that we have assigned clusters to each of the data points, we will proceed to the next iteration of K-Means and move the cluster centers to the centroid of their data points. Which direction will each of the cluster centers 1 and 2 move, respectively? (Multiple Choice)

1. Left, Left
2. Left, Right
3. Right, Left
4. Right, Right

Problem 2 (4 Points)

Consider the following elbow method plot generated using the K-Means algorithm. What is the natural number of clusters for this dataset?

(Text Entry)

