AI 2002 - Artificial Intelligence (Spring 2023)
Assignment # 5

Topics Covered: K-means clustering	Submission Deadline: **May 12, 2023, by 16.00 sharp**

Problem # 1:

Given the following dataset:

	X	Y
1	2	3
2	3	4
3	5	6
4	6	7
5	8	9

Perform K-means clustering with K = 2. Show the initial centroids, the assignment of points to clusters, and the final centroids. (Do it by hand and paste the images of work)

Problem # 2:

Implement K-means clustering on the given dataset in the csv file with K=2. Visualize the clusters using a scatter plot with different colors for each cluster. **Note**: Using Built-in libraries is not allowed for algorithm implementation and will result in zero marks. You may use NumPy, Pandas or Matplotlib, however.

Problem # 3:

Find the optimal number of clusters for the given dataset using the elbow method. Visualize the results using a line plot. **Note**: Using Built-in libraries is not allowed for algorithm implementation and will result in zero marks. You may use NumPy, Pandas or Matplotlib, however.

Problem # 4:

K-means clustering on the dataset with the optimal number of clusters found in question 3. Visualize the clusters using a scatter plot with different colors for each cluster. **Note**: Using Built-in libraries is not allowed for algorithm implementation and will result in zero marks. You may use NumPy, Pandas or Matplotlib, however.