DS481: Data Science
Assignment 4

Due Date: Wednesday, 26th May 2021 **Total Marks: 40**

1. Consider a Database D (Table 1) consists of 9 transactions. Find strong association rules using Apriori Algorithm. Suppose min. support count = 3 and min. confidence = 70%. At the end show association rules with frequent itemset with maximum item from Apriori. [**20 Points**]

Table 1: Database D for transactions. I_1 = Bread, I_2 = Milk, I_3 = Egg, I_4 = Toy, I_5 = Coke, I_6 = Chicken, I_7 = Cheese, I_8 = Juice.

TID	Items
1	I_1, I_2, I_7
2	I_1, I_2, I_3
3	I_2, I_4, I_5
4	I_1, I_2, I_5
5	I_5, I_6, I_7
6	I_I, I_2, I_7, I_8
7	I_I, I_2, I_3, I_8
8	I_1, I_3, I_5, I_6, I_7, I_8
9	I_2, I_3, I_4, I_6, I_7, I_8

2. Consider the following data matrix (M) consists of 2 features and 4 instances. [**20 Points**]

Table 2:

Feature 1	Feature 2
2	3
3	2
1	4
4	1

- Use Principal Component Analysis to find the first principal component of the above data matrix (M). In other words, reduce the number of dimensions to 1
- Let's assume that instead of starting with M^TM, you would like to examine eigenvalues using MM^T. What do you will be the eigenvalues using MM^T? Are they going to be same or different
- Calculate reduce dimension of new point (6,5). Do not run PCA again. Just simple matrix multiplication.