Activity 1  
**Explain in your own words, the meaning of the concept “Confidence”, and why is this measure useful?**

Attempted answer: Confidence is the measure of how certain we can observe the presence of the consequent given the presence of antecedent. A strong confidence would represent that there is a strong association between both the antecedent and the consequent.

**Explain in your own words, the meaning of the concept “Support”, and why is this measure useful?**

Attempted answer: Support is the measure of how frequently certain combination of items in both antecedent and consequent occur together in the data

**Explain in your own words, the meaning of the concept “Lift”, and why is this measure useful? Is Lift still necessary if we have a rule that has high confidence and high support?**

Attempted answer: Lift is a measure of how predictive the rule is compared to a random association, it can be said to be the ratio of expected confidence to observed confidence. A high lift indicates that the resulting rule is better at predicting the results of confidence than a random guess. (i.e. when lift > 1) Yes, even with a rule with high confidence and high support, it is still essential that we look at Lift. This is because confidence considers the conditional probability of the association whereas lift normalizes the confidence with the independence assumption of a unconditional probability.

**The Apriori algorithm is the standard method for generating association rules.**

1. **Explain in your own words, in a few sentences, how it works.**

The Apriori algorithm computes the total frequency of item sets. It first starts with 1 item set and then moves on to the nth item set. It continues increasing by one till the threshold has been reached.

**b) Is this sufficient to compute Confidence? Explain.**

It is sufficient as confidence can be expressed as the support of m items divided by the support of n items, and Apriori already has all these supports computed.

**Is Confidence or Lift a symmetric concept? Explain. Implications?**

Confidence is a measure of how certain we are in the association’s rules. Whereas, lift measures how predictive the rule is compared to a random choice.

The implications is that confidence is a conditional probability and hence non-symmetrical.

(i.e. P(A|B) != P(B|A))

Whereas, lift is symmetrical in the sense that P(B|A) == P(A|B)

Provide another potential application of association rules beyond groceries and insurance claims

Netflix, Amazon, Book Recommendation System, Course Recommendation System.